Curricula 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, 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:

1. Lower-division: 001–099; generally recommended for freshmen and sophomores.
2. 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.
3. Graduate: 200-299; normally open only to graduate students or undergraduates 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 Academic 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 see the quarterly Schedule of Classes.

University of California Extension Courses

Students may earn credit toward bachelor’s and master’s degrees at the University of California 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 University of California. 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 University of California 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.
AHS  Art History
ANTH Anthropology
ART  Art
AST  Asian Studies
BCH  Biochemistry
BIOL Biology
BLCN Conservation Biology
BLSC Biological Sciences
BMSC Biomedical Sciences
BPSC Botany and Plant Sciences
BSAD Business Administration
BSWT Basic Writing
CBNS Cell Biology and Neuroscience
CEE Chemical and Environmental Engineering
CHE Chemical Engineering
CHEM Chemistry
CHN Chinese
CLA Classical Studies
CMDB Cell, Molecular, and Developmental Biology
CPAC Comparative Ancient Civilizations
CPLT Comparative Literature
CRWT Creative Writing
CS Computer Science
DNCE Dance
ECON Economics
EDUC Education
EE Electrical Engineering
ENGL English
ENGR Engineering
ENSCE Environmental Sciences
ENTM Entomology
ENTX Environmental Toxicology
ENVE Environmental Engineering
ETST Ethnic Studies
EUR European Culture
FREN French
FVC Film and Visual Culture
GEN Genetics
GEO Geosciences
GER German
GRK Greek
HASS Humanities, Arts, and Social Sciences
HISA History of the Americas
HISE History of Europe
HIST History
HMDV Human Development
HNPG Honors Program
ITAL Italian
JPN Japanese
KOR Korean
LATN Latin
LING Linguistics
LNCR Learning Center
LNST Latin American Studies
LGBS Lesbian, Gay, Bisexual, Intersexual, and Transgender Studies
LTG Literature and Languages
LWSS Law and Society
MATH Mathematics
MCBL Microbiology
ME Mechanical Engineering
MGMT Management
MUS Music
NASC Natural and Agricultural Sciences
NREM Nematology
NRSC Neuroscience
PED Physical Education
PHIL Philosophy
PHYS Physics
PLPA Plant Pathology
PORT Portuguese
POSC Political Science
PSYC Psychology
RLST Religious Studies
RUSN Russian Studies
SOC Sociology
SPN Spanish
STAT Statistics
SWSC Soil and Water Sciences
THEA Theatre
URST Urban Studies
WMST Women’s Studies
WRLT World Literature
Anthropology

Subject abbreviation: ANTH

Thomas Patterson, Ph.D., Chair
Department Office, 1334 Watkins Hall
(909) 787-5524; Anthropology.ucr.edu

Professors
Eugene N. Anderson, Ph.D.
Wendy Ashmore, Ph.D.
Alan G. Fisk, Ph.D.
Christine Ward Gailey, Ph.D.
(Anthropology/Women’s Studies)
Michael Kearney, Ph.D.
David B. Kronenfeld, Ph.D.
Juan Vincente Palerm, Ph.D.
Thomas Patterson, Ph.D.
Karl A. Taube, Ph.D.
R. E. Taylor Jr., Ph.D.
Carlos G. Vélez-Ibáñez, Ph.D. Presidential Chair in Anthropology
Philip J. Wilke, Ph.D.

Professors Emeriti
Alan R. Beals, Ph.D.
Sylvia M. Broadbent, Ph.D.
Martin Orans, Ph.D.

Associate Professors
Scott L. Fedick, Ph.D.
Paul H. Gelles, Ph.D.
Sally Allen Ness, Ph.D. (Anthropology/Dance)

Assistant Professors
Maria L. Cruz-Torres, Ph.D.
Sang-Hee Lee, Ph.D.

Cooperating Faculty
Edna Bonacich, Ph.D. (Ethnic Studies/Sociology)
Henry W. Decker, Ph.D. (French)
Arturo Gómez-Pompa, Ph.D. (Botany and Plant Sciences)

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 citizenship. Besides helping students hone and refine analytical skills and critical thinking, anthropology helps them recognize the impact of cultural dynamics on interpersonal communication and 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 government 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.

Degree Requirements

University Requirements
See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements
See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements
The Anthropology Department offers an undergraduate major leading either to the B.A. or B.S. degree in Anthropology. The department also offers a major in Anthropology/Law and Society which leads to a B.A. degree. 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 (16 units)
a) ANTH 001, ANTH 002, and either ANTH 003 or ANTH 005
b) LING 020

2. Upper-division requirements
a) Thirty-six (36) units of upper-division Anthropology for the B.A.; 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. Under exceptional circumstances, some of these requirements may be waived. Students lacking such preparation are urged to consult with their advisor.

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. Requirements for Anthropology
   All requirements for the B.A. in Anthropology. See Anthropology major above for specific requirements.

2. Requirements for Law and Society (36 units)
a) PHIL 007 or PHIL 007H
b) IWSO 100
c) One course chosen from the following list: ECON 111, PSYC 012, SOC 110A, POSC 114 (or equivalent course in research methods)
d) Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159 (One of these courses may be replaced by a substitute choice from a list of courses published annually by the Law and Society Faculty Committee. Not more than two of the courses taken to meet this requirement [2.d] may be from the same department.)
e) IWSO 193, Senior Seminar

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 24 upper-division units and appropriate prerequisites as needed.

The courses are to be selected as follows:

1. Two upper-division courses (8 units) in cultural anthropology from ANTH 102, ANTH 122, ANTH 124, ANTH 125, ANTH 127, ANTH 131, ANTH 132, or ANTH 162. (ANTH 001 is the normal lower-division prerequisite for these courses.)

2. Two upper-division courses (8 units) from any one of the following subdisciplinary areas: (These courses normally entail an appropriate lower-division course [4 units] in the given subdiscipline.)
   a) Archaeology
      (1) Prerequisite: ANTH 003 or ANTH 005
      (2) Courses: ANTH 110, ANTH 111, ANTH 114A, ANTH 114B, or ANTH 117B
   b) Physical/Biological Anthropology
      (1) Prerequisite: ANTH 002
      (2) Courses: ANTH 107, ANTH 129, ANTH 146/PSY 146, ANTH 150/HMD 150, or ANTH 152
   c) Linguistic Anthropology
      (1) Prerequisite: LING 020
      (2) Courses: ANTH 120, ANTH 123, ANTH 165, ANTH 167/LING 167, or ANTH 170/BPSC 170

3. One area course (4 units) from ANTH 115 (E-Z), ANTH 140 (E-Z), or ANTH 168/ETST 148/INST 168

4. One methodological course (4 units) from ANTH 112, ANTH 116A, ANTH 157, ANTH 171, ANTH 175A, ANTH 175B, ANTH 183, ANTH 185A, or ANTH 185B

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

Education Abroad Program

The Anthropology Department encourages eligible students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units towards graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.ueap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

GRADUATE PROGRAM

The graduate program in Anthropology 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 a unified concept of the discipline, viewing the traditional subfields — sociocultural anthropology, biological anthropology, archaeology, and linguistics — as being crosscut by a series of foci. These foci articulate contemporary or emerging concerns within the discipline and constitute both the strengths and uniqueness of the program. The most developed foci at present are concerned with (1) transnational processes such as inequality, migration, and border and bi-national communities associated with the globalization of capital, (2) the archaeology of Mesoamerica and western North America, and (3) cultural and political ecology. Most of the faculty have conducted research in Latin America, so there is also depth of coverage in this area.

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 Students must take a minimum of 84 units before they can be advanced to candidacy (only 4 units of ANTH 302 are counted toward this total). During their first year students complete the year-long seminar sequence ANTH 200A, ANTH 200B, and ANTH 200C (Core Theory in Anthropology). Students are expected to 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 two courses in two of the subfields outside their subfield of specialization. For students not specializing in sociocultural anthropology, one of the subfields selected for the breadth requirement must be sociocultural.

Language Requirement For the Ph.D. degree, 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:

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 are expected to 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

An 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 Comprehensive 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.

Public Presentation 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.).

Advancement to Candidacy 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. The M.A. degree is awarded under Plan II (Comprehensive Examination). Candidates for the M.A. degree 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
The M.S. degree is awarded under Plan I (Thesis). Candidates for the M.S. degree 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.

ANTH 001. Cultural Anthropology. (4)
Lecture, three hours; discussion, one 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. Credit is awarded for only one of ANTH 001 or ANTH 001H.

ANTH 001H. Honors Cultural Anthropology. (4)
Lecture, three hours; discussion, one hour. Prerequisite(s): consent of instructor.Honors course corresponding to ANTH 001. 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 cultures to problems of the modern world. Credit is awarded for only one of ANTH 001 or ANTH 001H.

ANTH 002. Biological Anthropology. (4)
Lecture, three hours; discussion, one hour. 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. Credit is awarded for only one of ANTH 002 or ANTH 002H.

ANTH 002H. Honors Biological Anthropology. (4)
Lecture, three hours; discussion, one hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to ANTH 002. 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. Credit is awarded for only one of ANTH 002 or ANTH 002H.

ANTH 003. World Prehistory. (4)
Lecture, three hours; discussion, one 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, three hours; consultation, one 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. (4)
Lecture, three hours; discussion, one hour. A general introduction to the aims and methods of archaeology; in the field and in the laboratory. World prehistory as revealed by these methods will be briefly surveyed.

ANTH 006. Introduction to World Music. (4)
Lecture, three hours; discussion, one hour. Prerequisite(s): none. A survey of music, 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 MIS 006.

ANTH 009. Native American Art. (4)
Lecture, three hours; extra reading, three hours. Prerequisite(s): none. This course is a comparative introduction to the material culture and art of Native North America. It will investigate architecture, dress, sculpture and other material objects in the context of divergent pre-Columbian and modern aesthetic and belief systems. Cross-listed with AHS 009.

ANTH 010. Mysteries of the Ancient Maya. (4)
Lecture, three hours; outside research, three 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, three hours; extra reading and written exercises, three 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, three hours; consultation, one hour. Survey of health, disease, curing and nutrition in cross-cultural perspective. Ways in which different cultural groups conceive of disease, health maintenance and healing; how traditional beliefs about health and nutrition arise; what we can and cannot learn from traditional health-seeking practices.

ANTH 027. Art of Pre-Columbian America. (4)
Lecture, three hours; outside research, three hours. Prerequisite(s): none. A survey course intended to provide an up-to-date background to the 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.

ANTH 030. People, Plants, and Animals. (4)
Lecture, three hours; outside research, three hours. Prerequisite(s): none. An introduction to anthropological investigations of human uses of biotic resources. The course focuses on management: worldwide comparisons of strategies for domesticating, using, and conserving plants and animals; and worldwide search for better and more sustainable strategies.
ANTH 102. Anthropology of Art. (4) Lecture, three hours; outside research, three 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, three hours; outside research and projects, three hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. An introduction to the rapidly growing 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 FVC 103.

ANTH 104. Human Social Organization. (4) Lecture, three hours; individual consultation as needed, one hour. An inquiry into the study of families, clans, 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, three hours; outside reading and written exercises, three hours. 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. Cross-listed with BSSD 105.

ANTH 106. Psychological Anthropology. (4) Lecture, three hours; consultation, one hour. Research and theory concerning the relationships of culture and personality, psychological similarities and differences in cross-cultural perspective, culturally standardized cognitive systems; why anthropologists are interested in psychological theory.

ANTH 107. Evolution of the Capacity for Culture. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 002 or ANTH 002H 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 which 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 109. Women, Politics, and Social Movements: Global Perspectives. (4) Lecture, three hours; outside research, three 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. Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.

ANTH 110. Prehistoric Agriculture. (4) Lecture, three hours; outside research, three 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 theory of reconstructing agricultural systems and their role in prehistoric societies.

ANTH 111. Peopling of the New World. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three 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 114. Lithic Technology I. (4) Lecture, three hours; laboratory, four 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 flake production, 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, three hours; laboratory, four hours. Prerequisite(s): ANTH 114A and consent of instructor. The technology of core-and-blade industries, ground-stone industries, and mill-stone 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 and the quarrying of raw material and production of millstones. Assemblage formation processes and their interpretation.

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, three hours; extra reading, three 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, three hours; extra reading, three 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, three hours; extra reading, three 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 Lithic-stage manifestations, regional and temporal expressions of the Western Archaic, Formative Anasazi and Fremont developments, and the Numic peoples. Emphasis will be on cultural ecology and ecological theory.

ANTH 115R. Archaeology of Eastern Mesoamerica. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An introduction to Mayan archaeology intended to provide an overview of the earliest dated archaeological cultures of Mesoamerica.

ANTH 115S. Archaeology of Western Mesoamerica. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. An introduction to prehistoric and historic archaeology in the New World nuclear area of Western Mesoamerica from theoccupation 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, three hours; outside research, three 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, three hours; extra reading, three 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, three hours; outside research, three hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 003 or ANTH 005; or consent of instructor. Explores current understanding about ancient Zapotec, Mixte, 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, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. A survey 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, three hours; outside research, three 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, three hours; extra reading, three hours. Prerequisite(s): ANTH 001 or ANTH 001H or ANTH 003 or ANTH 005 or consent of instructor. An introduction to the cultural 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 120. Language and Culture. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): LING 020, or consent of instructor. An introduction to language, its relationship to the interrelationships of language, culture, and habitual behavior; the classification of languages; and anthropological uses of linguistic evidence.

ANTH 121. Anthropological Theories of the Arts. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): ANTH 001 or ANTH 001H or con-
sent 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 considered, not only in terms of the ethnographic perspective, but also through a diachronic perspective, from the establishment of the colonial system to the present, and the role of peasantry in 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 144. Hunters and Gatherers. (4) Lecture, three hours; consultation, one hour. An overview of hunting-gathering 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 patterns, the organization of bands, and models for prehistoric populations.

ANTH 146. Primate Social Behavior. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ANTH 002 or ANTH 002H or PSYC 002. A consideration of 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 149. Gender, Kinship, and Social Change. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): WMST 001. Examines theories of gender and kinship, the commodification 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 Micro-evolution. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): ANTH 002 or ANTH 002H; relevant preparation in the life sciences; or consent of instructor. The methods of classical and population genetics applied to the understanding of evolution and variation in contemporary human populations. Cross-listed with HMBD 150.

ANTH 152. Human Paleontology. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): ANTH 002 or ANTH 002H or consent of instructor. A consideration of human evolution from the lower primates as evidenced by the fossil record; the morphology, ecology, and culture of fossil humans in the light of the synthetic theory of evolution.

ANTH 155. Human Osteology. (4) Lecture, two hours; discussion, one hour; outside research, three hours. Prerequisite(s): ANTH 002 or ANTH 002H; relevant preparation in the life sciences; or 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, two hours; discussion, one hour; outside research, three 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 157. Methods in Biological Anthropology. (4) Lecture, three hours; extra reading, one hour. ANTH 002 or ANTH 002H; upper-division standing or consent of instructor. A survey of data collection methods used in biological anthropology in the study of both human and nonhuman primates. Emphasis on observational methods, but data organization, entry, analysis, and presentation are also discussed. Deals with the research process in biological anthropology from data collection to formal presentation.

ANTH 158. Biocultural Approaches to Medical Anthropology. (4) Lecture, three hours; outside research, two hours. Prerequisite(s): ANTH 002 or ANTH 002H; upper-division standing or consent of instructor. Introduces medical anthropology from the biocultural 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, three hours; outside research, three hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 002 or ANTH 002H; or consent of instructor. Introduces medical anthropology from the biocultural 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 160. Political Economy of Health. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines critical medical anthropology. Focuses on the linkages between 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, three hours; outside research, three hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 002 or ANTH 002H; relevant preparation in the life sciences; or consent of instructor. A survey of historical and political 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. Comparisons are made with the problems and prospects of multiethnic societies worldwide.

ANTH 162. Culture and Medicine. (4) Lecture, three hours; consultation, one 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, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. A critical survey of recent anthropological research and related research and theory concerning transnational and global sociocultural processes. Special emphasis on transnational, diasporic, and other unbound communitie; borders; 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, three hours; outside research, three 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 LST 164 and WMST 164.

ANTH 165. Cognitive Anthropology. (4) Lecture, three hours; individual consultation, one hour. The structure and knowledge of different cultures examined in the light of theories of how people learn them, store them, and use them.

ANTH 167. Structural/Descriptive Linguistics. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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 ETS 148 and LST 168.

ANTH 170. Ethnobotany. (4) Lecture, two hours; seminar, one hour; discussion, one hour. Prerequisite(s): BIOL 104/BPSC 104; 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, two hours; laboratory, three to six 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, three hours; extra reading, three 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 strategies.

ANTH 173. Social Meanings of Space. (4) Lecture, three hours; outside research, three 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 175A. Anthropological Research: Basic Techniques. (4) Lecture, three hours; consultation, one hour. Includes basic data gathering procedures in anthropological field work such as censuses, maps and surveys and questionnaires.

ANTH 175B. Anthropological Research: Specialized Techniques. (4) Lecture, three hours. Includes ethnographic field techniques such as the aggregation of open-ended data, frame elicitation, componental analysis, collection of quantitative data, behavioral observation, and social-cultural inferences from geographical and spatial distributions.

ANTH 175C. Anthropological Research: Data Presentation. (4) Lecture, three hours. Includes problems in the collection, analysis, and presentation of data such as strategy and rapport in field work, ethics of field research, theory construction, research problems, bibliographic technique, preparation of research proposals, final data analysis, and the writing of research papers and dissertations.

ANTH 176. Music Cultures of Southeast Asia. (4) Lecture, three hours; extra reading, three 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, DME 127, ETH 172, and MUS 127.

ANTH 177. Gender, Sexuality, and Music in Cross-Cultural Perspectives. (4) Lecture, three hours; extra reading, three 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, three hours; outside research, three hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 002 or ANTH 002H; 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 180A. Introduction to Anthropological Methods and Techniques. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): ANTH 001 or ANTH 001H; ANTH 002 or ANTH 002H; consent of instructor. Consideration of major roles in anthropological methods and techniques. Cross-listed with ANTH 180B.
cultural anthropology, and physical anthropology. Explores the epistemology of scientific discourse; debates in ethnohistory, linguistics, and processual and poststructuralist archaeology; explores physical anthropology; with an emphasis on demographic, epidemiological, and genetic analysis.

ANTH 180B. Research Methods and Techniques in Cultural Anthropology. (4) Lecture, three hours; fieldwork, thirty 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 181 (E-Z). Current Problems in Anthropological Theory. (4) For hours and prerequisites, see section descriptions. Different aspects of anthropological theory are emphasized.

ANTH 181E. Ethnobiology. (4) Lecture, three hours; extra reading and book reviews, three hours. Prerequisite(s): ANTH 001 or ANTH 001H or equivalent. Methods and theories of ethnobiology explore the ways in which people of different cultures use and think about plants and animals. Topics include conservation, biodiversity, traditional ecological knowledge, and changes in use and management over time.

ANTH 181G. Research and Findings in the University. (4) Seminar, three hours, outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the different forms that research and findings take in various disciplines across the university. Includes presentations by faculty from these disciplines. Student work consists of group papers comparing research in two related, but contrasting, disciplines. Credit is awarded for only one of ANTH 181G, INPG 020, or HASS 033.

ANTH 181X. Cognitive Studies. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): ANTH 120 or ANTH 125 or ANTH 165 or CS 014 or consent of instructor. An exploration of the application of analytic techniques, methods, and tools from computer science and artificial intelligence to problems in cognitive anthropology and related areas.

ANTH 181Z. Classification, Computers and Knowledge. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): ANTH 120 or ANTH 125 or ANTH 165 or CS 014 or a course in either botany or biology or consent of instructor. Knowledge structures and classification schemes used in plant taxonomy will be studied. Classification or categorization schemes from linguistics and computer science and concept analysis from abstract mathematics will be explored for ideas and techniques potentially applicable to plant classification. Course research projects will develop computing techniques for assisting in plant classification.

ANTH 183. Methods of Archaeological Analysis. (4) Lecture, two hours; laboratory, three hours; extra reading, three hours. Prerequisite(s): ANTH 003 or ANTH 005 or consent of instructor. Description and classification of archaeological materials including laboratory work in cataloguing 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 185A. Field Course in Archaeology: Survey and Documentation. (4) Lecture, one hour; discussion, one hour; field, six hours. Prerequisite(s): ANTH 005 or ANTH 005 and either upper-division standing or consent of instructor. The course will train students in field surveying and documentation of historic and aboriginal archaeological sites of many kinds. Students will receive experience in satellite-assisted electronic location; cadastral survey location; Universal Transverse Mercator grid coordinates; field mapping; recording environmental parameters; assemblage characterization; assessing significance; and use of archaeological information centers.

ANTH 185B. Field Course in Archaeology: Excavation. (4) Lecture, one hour; discussion, one hour; field, six hours. Prerequisite(s): ANTH 003 or ANTH 005 and either upper-division standing or consent of instructor. Lectures and archaeological excavation with training in site mapping, excavation techniques, methods of recording excavation data, field photography, and initial laboratory processing of recovered materials. Course is repeatable to a maximum of 12 units with consent of instructor and approval of a research plan by the Department Chair.

ANTH 186. People and the Environment in Latin America. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. An interdisciplinary course focusing on the study of the relationship between human communities and the environment in Latin America. Environmental problems and policies are examined. Cross-listed with LNST 186.

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 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. Graded In Progress (IP) until ANTH 195A, ANTH 195B, and ANTH 195C are completed, at which time a final grade is assigned.

ANTH 198-L. Internship in Anthropology. (1-12) Field research, one to sixteen 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. To be graded Satisfactory (S) or No Credit (NC). Repeatable for 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, three hours; outside research, three 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, three hours; outside research, three 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 209. Field Course in Maya Archaeology. (4-12) Lecture, two hours; laboratory, three to six hours; outside research, zero to three hours; field, three to twenty-one 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, three hours; outside research, one hour; individual study, one hour; extra reading, one 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, three hours; outside research, one hour; extra reading, one hour; proposal preparation, one 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 210C. Professionalism in Anthropology. (4) Seminar, three hours; outside research, one hour; extra reading, one hour; proposal preparation, one 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 214. Lithic Analysis. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): ANTH 114A, ANTH 114B, or consent of instructor. Characterization, analysis, and interpretation of stone tool assemblages, with emphasis on debitage.

ANTH 218. Ancient Maya History and Religion. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): ANTH 114A, ANTH 114B, or consent of instructor. Characterization, analysis, and interpretation of stone tool assemblages, with emphasis on debitage.

ANTH 219. Ancient Maya History and Religion. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): ANTH 114A, ANTH 114B, or consent of instructor. Characterization, analysis, and interpretation of stone tool assemblages, with emphasis on debitage.
considered in the context of their theoretical tradition, sources, and responses to antecedent work.

ANTH 250A. Seminar in History and Theory of Anthropology: Beginnings. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three 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-functionalism.

ANTH 251. Theory and Method in Mexican Ethnography. (4) Seminar, three hours; outside research, three 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, three hours; research, three hours. Prerequisite(s): consent of instructor. Studies in culture history and in the data and methods of archaeological research. May be repeated for credit.

ANTH 253. Seminar in Physical Anthropology. (4) Seminar, three hours. Prerequisite(s): consent of instructor. Selected topics in the analysis of human variation and evolution, the structure of human populations, and the biosocial environments of humans.

ANTH 254. Writing Women: Issues in Feminism(s), Representation, Ethnographic Practice. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines intersections of power, authority, and representation in the gendered methodologies entailed in the production of anthropological knowledge. A focus on postcolonial and feminist theorizing introduces students to novel debates about ethnographic writing and practices. Text, context, and reflexivity in writing are explored in depth. Cross-listed with WMST 254.

ANTH 255. Field Methods in Ethnomusicology. (4) Seminar, three hours; outside research, one hour; field, two hours. Prerequisite(s): graduate standing. A theoretical and practical introduction to fieldwork in music and dance and describing performance events are covered. Cross-listed with MUS 255.

ANTH 256. Seminar in Current Anthropological Research. (4) Seminar, two hours; individual consultation, one hour. The seminar will normally be conducted by an outstanding scholar on a topic of significant anthropological interest arising out of the scholar’s particular research.

ANTH 258. Seminar in Dating and Analytical Techniques in Archaeology. (4) Seminar, two hours; individual consultation, one hour. Prerequisite(s): consent of instructor. A research seminar devoted to topics in dating and analytical techniques in archaeology involving laboratory instruction and experimental work.

ANTH 259. Seminar in Anthropological Linguistics. (4) Seminar, three hours; outside research, three hours. Studies in the concepts, methods and data pertinent to anthropological linguistics.

ANTH 260. Seminar in General Anthropology. (1) Seminar, eighteen hours per quarter. Prerequisite(s): graduate standing or consent of instructor. Presentations by graduate students, faculty, and visiting scholars on current research topics in anthropology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.


ANTH 263. Seminar in Ecological Anthropology. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three 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 270. Special Topics in Ethnomusicology. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MUS 207, graduate standing, and/or consent of instructor. Focuses on current scholarship in ethnomusicology and related fields. Theme varies, but emphasis is usually on theory and methodology or the study of particular regions or performance traditions. For further information, see Department. Course is repeatable to a maximum of 8 units. Cross-listed with MUS 270.

ANTH 276. Seminar in Historical Anthropology: Theories, Methods, and Consequences. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the interplay between anthropology and history. Concepts such as “time” and “culture” are framed within the contexts of the European Enlightenment and imperial expansion. Students read critiques of colonialism, gender, and nationalism that suggest creative methodology and theory for both disciplines.

ANTH 277. Seminar in Political Ecology. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): a graduate or upper-division undergraduate course in cultural anthropology 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, three hours; outside research, three 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, three hours; outside research, three 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 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. (1-4) 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 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. Course will receive a letter grade. 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.

ANTH 301. The Teaching of Anthropology. (1-4) Prerequisite(s): graduate standing and consent of instructor. Discussion of the bibliography, research techniques, and teaching techniques related to the instruction of anthropology; consideration of how to lead discussion sections and how to relate student experience to anthropological problems. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

ANTH 302. Teaching Practice. (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. Fullfills teaching portion of Ph.D. teaching requirement. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

ART Subject abbreviation: ART

John M. Divola, M.F.A., Chair
Department Office, 235 Arts (909) 787-2676; art.ucr.edu

Professors
Uta Barth, M.F.A.
John M. Divola, M.F.A.
Jill Giegerich, M.F.A.
Jonathan W. Green, M.F.A. (Art/Art History)
James S. Stromboine, M.F.A.
Erika Suderburg, M.F.A.

Professor Emeritus
William T. Bradshaw, M.A.

Assistant Professor
Amir Zaki, M.F.A.

Lecturer
Gordon L. Thorpe, M.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, printmaking, 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 nonmajors and nondegree students.

Students who wish to declare a major in Art must submit a portfolio of work consisting of five slides or digital prints of original work. Students whose portfolios are approved will be admitted to the major. Guidelines for submission are available from the Department of Art, Undergraduate Admissions, and the Office of Relations with Schools.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

The major requirements for the B.A. in Art are as follows:

1. Lower-division requirements (24/25 units)
   a) ART 006/FVC 006 and ART 008 (must be taken during first year of residency in the department)
   b) Three additional lower-division Art courses: ART 001, ART 002, ART 003, ART 004/FVC 004 or ART 007/FVC 007
   c) One of the following Art History courses: AHS 008/FVC 008, AHS 017A, AHS 017B, AHS 017C, or ART 021/URST 021

2. Upper-division requirements (48 units)
   a) ART 160
   b) One of the following Art History courses: AHS 174/FVC 177, AHS 176/FVC 176, AHS 180, AHS 181, AHS 182, AHS 184/URST 184, AHS 185/URST 185, AHS 186 or any other upper-division Art History course that covers the period 1945 to present
   c) ART 180
   d) A minimum of 32 additional units of upper-division Art course work
   e) ART 195 (Senior Thesis)

   To fulfill ART 195 (Senior Thesis), students who have completed at least 32 of the required 48 units of upper-division Art course work make a formal presentation of a thesis project to a faculty committee two quarters prior to actual enrollment in ART 195.

   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 to the major in the respective lower- or upper-division category.

   A minimum of 56 units of Art must be taken in residence (UCR Department of Art) to fulfill this major.

Education Abroad Program

The Art Department encourages students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California's EAP Web site at www.uoeap.ucsb.edu or contact UCR's International Services Center at (909) 787-413. See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

LOWER-DIVISION COURSES

ART 001. Beginning Drawing and Design. (4)
Lecture, two hours; studio, four 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, two hours; studio, four 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, three hours; studio, four hours. Introduction to the basic principles of photography; an exploration of the tools, materials, and techniques of photography as an expressive medium. Students provide their own 35-mm, single lens reflex cameras.

ART 004. Introduction to Video Art. (4)
Lecture, two hours; screening, six hours. Prerequisite(s): none. An introduction to video as an art form based in production and contemporary media theory. Basic production techniques, operation of the camcorder and the fundamentals of live-action production, and editing. A series of screenings, readings, and discussions examine documentary, experimental, and other applications of the media arts in relation to contemporary art practice and such new genres as installation and performance. Cross-listed with FVC 004.

ART 005. Beginning Sculpture and Three-Dimensional Design. (4)
Lecture, three hours; studio, three 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, three hours; field trip, three hours every other week; extra reading, three hours. Examines basic principles and methodologies of theory as applied to the interpretation and creation of works of art. Includes lectures, discussions, readings, screenings, gallery visits, and critiques. Cross-listed with FVC 006.

ART 007. Introduction to Digital Imaging. (4)
Lecture, three hours; laboratory, three hours. Introduction to making art by utilizing the Macintosh computer. Emphasis is on the personal, theoretical, and conceptual implications of such work within the broader field of contemporary art. Cross-listed with FVC 007.

ART 008. Current Topics in Contemporary Art. (4)
Lecture, three hours; field, three hours. Examines visual arts as contemporary phenomenon. Study of recent exhibitions of contemporary art, the way art is culturally distributed, and the ideological and conceptual dialogue surrounding significant contemporary art. Visits to nearby museums and major art galleries are required.

ART 028. From Hamlet to Babylon: Introduction to Design in Film, Television, and Theatre. (4)
Lecture, three hours; screening, three hours. Prerequisite(s): none. An introduction to the design process for film, television, and theatre. Through exercises, lectures, videos, and on-site visits, students explore the design process, the influence of design on the viewer, and how looks are achieved in different media. Cross-listed with FVC 028 and THEA 038.

ART 070 (E.Z). Digital Imaging Software for the Visual Arts. (1)
Lecture, six hours per quarter; laboratory, twelve hours per quarter. Prerequisite(s): ART 007/FVC 007. Trains students 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 (Final Cut Pro, Avid, Media 100); G. Introduction to Web Authoring (Dreamweaver, Quicktime); H. Introduction to Graphic Design and Desktop Publishing (Quark). Each segment is repeatable to a maximum of 3 units.

UPPER-DIVISION COURSES

ART 102. Intermediate Drawing. (4)
Lecture, two hours; studio, four 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, two hours; studio, four 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, two hours; studio, four 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; pur-
pose, a fuller understanding of the figure and figure com-
position; method combines lectures with exercises in stu-
dio and outside assignments. Course is repeatable to a 
maximum of 12 units.

ART 110. Intermediate Painting. (4) Lecture, two 
hours; studio, four 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, two 
hours; studio, four hours. Prerequisite(s): ART 110 and 
consent of instructor. Advanced problems in figurative and 
nonfigurative painting. Emphasis on the development of 
personal direction. Investigation of the individual student’s 
relation to contemporary ideas in painting. In-studio lec-
tures, studio exercises, and outside assignments. May 
be repeated for credit to a total of 12 units.

ART 120. Printmaking. (4) Lecture, two hours; stu-
dio, four hours. Prerequisite(s): ART 110 and ART 002, 
or equivalent and consent of instructor. A studio course in 
graphic expression using traditional printmaking processes 
with emphasis in lithography and intaglio techniques. 
Studio exercises, lectures and outside assignments. May 
be repeated for credit to a total of 12 units.

ART 122 (E-Z). Advanced Printmaking Work-
shop. (4) Lecture, two hours; studio, four hours. Prereq-
usite(s): ART 120 and consent of instructor. Designed to 
provide concentrated study and practical experience in a 
single graphic medium. In any one course instruction will 
focus in lithography, serigraphy, intaglio, or relief process-
as determined by the instructor. E. Lithography, 
Serigraphy, Intaglio, E. Lithography. May be repeated for 
credit to a total of 12 units.

ART 124. Printmaking: Photomechanical Pro-
estas. (4) Lecture, two hours; studio, four hours. Prereq-
usite(s): ART 001 and ART 003. An introductory course concentrating on practical and aesthetic problems in photomechanical printmaking processes. Topics will include photo-offset, photolithography, photogravure and related laboratory technologies.

ART 131. Photography and Digital Technology. (4) Lecture, three hours, laboratory, four hours. Prerequi-
site(s): ART 003. ART 007/FVC 007. An intermediate course in photo and digital technologies with a range of photographic applications. Covers the complete cycle of production from scanning to output. Emphasis is placed on developing skill in creating digital photographic im-
ageries for creative, cultural expression. Software and some digital equipment are provided. Students are required to furnish their own 35mm single lens reflex (SLR) or digital cameras and flash discs. Cross-listed with FVC 131.

ART 133. Art Workshop. (4) Lecture, two hours; stu-
dio, four hours. Prerequisite(s): ART 001 and ART 002 or 
equivalent, a minimum of 12 upper-division units in Art, 
and consent of instructor. Emphasis on interrelationship of the arts. Development of individual projects in varied media as facilities permit. Studio exercises, lectures, and outside assignments. May be repeated for credit to a total of 12 units.

ART 134. Mixed Media. (4) Lecture, three hours; stu-
dio, three hours. Prerequisite(s): ART 001 and ART 002. 
Exploration into experimental methods for creating an 
image: techniques of foreground, collage, photo transfer, 
molding and mold making, assemblage.

ART 135. Intermedia: Art, Media, and Culture. (4) 
Lecture, two hours; screening, six hours. Prerequisite(s): 
upper-division standing or consent of instructor. A study of 
photography, video, film, television, installation, 
and other related “intermedias.” Through field trips, 
screenings, readings, and discussion, focuses on artworks 
within and without the mass media: how they are con-
structed, written about, analyzed, and viewed in the larger 
construction of culture. Cross-listed with FVC 135.

ART 136. Installation and Site-Specific Art. (4) 
Lecture, three hours; studio, three hours. Prerequisite(s): consent of instructor. Focuses on performance, photo, installation, computer, site-specific installation, sculpture, and/or other intermediary. Concentrates on production and analysis of site-specific art through screenings, readings, discussion, and critique. Course is repeatable to a maximum of 8 units.

ART 140. Intermediate Photography. (4) Lecture, 
two hours; studio, four hours. Prerequisite(s): ART 003 or 
equivalent. Focus on projects and assignments to develop 
individual creative approaches in photography and strengthen controls and techniques in black and white printing. Students are required to furnish their own cameras. Course is repeatable to a maximum of 8 units. Cross listed with FVC 140.

ART 142. Color Photography. (4) Lecture, two 
hours; studio, four hours. Prerequisite(s): ART 003. 
Provides students with a basic background in the history, 
theory, techniques, and materials of color photography. 
Students are required to furnish their own cameras. Course is repeatable to a maximum of 8 units.

ART 145. Advanced Photography Workshop. (4) 
Lecture, two hours; studio, four hours. Prerequisite(s): 
ART 140/FVC 140. Consent of instructor. An advanced stu-
dio course designed to focus on selected special tech-
niques 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, S. Current Art Practices.

ART 150. Intermediate Video Art. (4) W S Lec-
ture, two hours; studio, four hours. Prerequisite(s): ART 
004/FVC 004. Intermediate course in video art production 
and theory, designed to continue work done in ART 004/ 
FVC 004. Screenings, readings, and discussions. Advanced 
editing techniques and theory, storyboard, and sound 
design. Application of media arts to contemporary art 
practice and new genres, including installation, documenta-
tary, experimental, and performance. Equipment provid-
ed. Course is repeatable to a maximum of 8 units. Cross-
listed with FVC 150.

ART 153. Advanced Video and Film Art. (4) 
Lecture, three hours; laboratory, three hours. Prerequisite(s): 
ART 150/FVC 150. Advanced course in video art produc-
tion and theory. Examines media arts in the context of con-
temporary art practice and digital video and film genres, 
including installation, experimental, documentary, and per-
formance. Uses video as a tool to explore various conceptu-
al and methodological issues connected with time-based 
media. Course is repeatable to a maximum of 12 units.

ART 160. Intermediate Art Theory. (4) Lecture, 
three hours; extra reading, three hours. Prerequisite(s): 
ART 006/FVC 006 recommended. Discusses current criti-
cal and theoretical issues in modern and contemporary art. 
Examines student’s art production in light of contem-
porary art practice and in relation to the interpretation and 
creation of art inclusive of issues of race, gender, politics, 
easethetics, class, and sexuality. Cross-listed with FVC 160.

ART 167. Intermediate Digital Media: Web 
Authoring. (4) Lecture, three hours; laboratory, four 
hours. Prerequisite(s): ART 007/FVC 007 or consent of 
instructor. Examines the histories, myths, and technical 
particularities of the digital space from the perspective of how the interaction and creation of art inclusive of issues of race, gender, politics, aesthetics, class, and sexuality. Cross-listed with FVC 160.

ART 168. Intermediate Digital Media: Interac-
tive Technology. (4) Lecture, three hours; laboratory, 
three hours. Prerequisite(s): digital art course or consent 
of instructor. concentrates on the development of both time-based and environmental forms; explores issues including interactivity, interface design, activism, and mul-
tiple narratives. Does not cover software training or com-
mmercial graphic design.

ART 169 (E-Z). Digital Imaging for the Visual Art-
sMedia: Intermediate Software Skills. (1) Le-
ture, six hours per quarter. Prerequisite(s): ART 007/FVC 007 or consent of instructor. Builds skills in preparation for digital imaging application across varied media. Covers Web design, digital video editing, video composing and effects, Web author-
ing, digital photography, and desktop publishing. Hands-on workshops target specific software that aid the artist in developing digital production skills that can be applied to a wide array of intermediate course work. E. Image Manipu-
lation (Adobe Photoshop); F. Video Editing (Final Cut Pro, 
Adobe AfterEffects); G. Web Authoring; H. QuickTime); J. Graphic Design and Desktop Publishing (QuarkX). Each segment is repeatable to a maximum of 3 units.

ART 170. Advanced Digital Imaging. (4) Lecture, 
three hours; laboratory, three hours. Prerequisite(s): ART 
007/FVC 007; knowledge of Macintosh interface and 
Adobe Photoshop. An advanced studio and production course in digital imaging which proceeds from techniques initiated in ART 007/FVC 007. Emphasizes the use of computer and electronic technology as a tool for making art. Addresses issues related to making art and the cultural implications of digital technology through class projects, readings, lectures by visiting artists, field trips, and cri-
tiques of work in progress. Course is repeatable to a max-
imum of 8 units. Cross-listed with FVC 175.

ART 175. Advanced Digital Workshop. (4) Lecture, 
three hours; laboratory, three hours. Prerequisite(s): ART 
131/FVC 131 or ART 150/FVC 150. Designed to encourage 
the development of individual projects utilizing digital tech-
ology. Focuses on the use of the Internet and explores issues including access, 
commercial graphic design.

ART 185. Senior Thesis Seminar. (4) Lecture, 
three hours; preparatory work, three to six hours. Prereq-
usize(s): ART 008/FVC 008; senior standing in Art. A re-
sumé of upper-division studio art courses; review of preliminary portfolio two quarters before intended enrollment. Independent work and group semi-
nars; completion of thesis statement and presentation of 
a finished body of work to faculty thesis committee. Satisfac-
tory (S) or No Credit (NC) grade only. Credit is awarded for only one of ART 185 or ART 195.

ART 189. ArtsBridge. (1-4) Workshop, five hours 
per quarter; consultation, five hours per quarter, extra 
preparation or extra reading, three hours per week; field 
work, one and half hours to six hours per week. Prereq-
usite(s): consent of instructor, demonstrated ability or 
knowledge in the practice area, and consent of instructor. 
Advanced assignments in K-12 arts outreach along with 
workshops to explore the pedagogical requirements for 
and teaching techniques to be used by ArtsBridge schol-
ars. For information on the ArtsBridge program see
ART HISTORY

Subject abbreviation: AHS

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Assistant Professors
Eduardo de Jesus Douglas, Ph.D.
Caroline F. Murphy, Ph.D.

Cooperating Faculty
Karl A. Taube, Ph.D. (Anthropology)

MAJOR

Throughout history, art, architecture, and visual culture in general have been among the most powerful means of social interaction and communication. Today, the visual dominates perhaps more than ever before. The discipline of Art History attempts to analyze critically how the visual arts functioned in the past and continue to function in the present through a thorough understanding of their formal, social, political, historical, and ideological bases. Toward this aim, the 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.

Career Opportunities

The major in Art History is a versatile one. Since Art History is an interdisciplinary subject that teaches critical thinking, majors are well-prepared to find successful careers in teaching, research, museums, galleries, art criticism, publishing, historic preservation, and law, as well as to obtain advanced degrees in Art History, the humanities, social sciences, and professional schools.

Education Abroad Program

The Department of Art History actively encourages eligible students to take advantage of the Education Abroad Program (EAP) in order to enrich their knowledge and experience of the different cultures which are, in part, the subject of Art History. Students on EAP receive UC credit toward their degrees, and, with careful planning, may make normal progress toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to plan study abroad 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

Art History Major

The major requirements for the B.A. in Art History are as follows:

1. Lower-division requirements (16 units)
   - AHS 015, AHS 017A, AHS 017B, and AHS 017C (It is strongly recommended that the AHS 017 series be taken sequentially.)
2. Upper-division requirements (36 units)
   a) AHS 192

b) At least 4 units from each of the following seven areas:
   1. Asian: AHS 140/AST 140, AHS 141/AHS 141, AHS 143/AST 143, AHS 144/AST 144
   2. Ancient: AHS 147, AHS 148, AHS 154
   3. Medieval: AHS 155, AHS 156, AHS 157, AHS 159
   4. Renaissance: AHS 161, AHS 162, AHS 163, AHS 164, AHS 165
   5. Seventeenth and Eighteenth Centuries: AHS 171, AHS 172, AHS 173
   6. Nineteenth and Twentieth Centuries: AHS 174/FVC 174, AHS 176/FVC 176, AHS 177, AHS 180, AHS 181, AHS 182, AHS 186/FVC 186
   7. Architecture: AHS 146/AST 146, AHS 184/URST 184, AHS 185/URST 185

3. Four (4) elective units from:
   - AHS 008/FVC 008
   - AHS 009/ANTH 009
   - AHS 021/URST 021
   - AHS 027/GEN 027
   - or any upper-division Art History or Art course

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 to allow pursuit of a wide variety of future career and educational options. The major requirements for the B.A. degree in Art History/Administrative Studies are as follows:

Art History requirements (52 units)

1. Lower-division requirements (16 units):
   - AHS 015, AHS 017A, AHS 017B, AHS 017C

2. Upper-division requirements (36 units):
   a) AHS 192, Junior and Senior Seminar (4 units)
   b) Four (4) units in each of 7 areas
      (Asian, Ancient, Architecture, Medieval, Renaissance, 17th/18th Centuries, and 19th/20th Centuries)
   c) Four (4) units of upper-division Art History courses

Administrative Studies requirements (37 units)

1. Lower-division requirements (17 units)
   a) BSAD 010, BSAD 020A
   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 102A or ECON 130 or ECON 162/BSAD 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): BSAD 105/ANTH 105, BSAD 176/SOC 176, SOC 150, SOC 151
      (2) Human Resources Management/Labor Relations: BSAD 152/ECON 152, BSAD 153/ECON 153, BSAD 155, BSAD 157, PSYC 142
      (3) Business and Society: BSAD 161, PHIL 116, POSC 182, POSC 186
      (4) Marketing: BSAD 110, and two from BSAD 112, BSAD 113, BSAD 114, BSAD 117
      (5) Managerial Accounting/Taxation: BSAD 163, and two from BSAD 166, BSAD 168A, BSAD 168B
      (6) Financial Accounting: BSAD 163, BSAD 165A, BSAD 165B
      (7) Finance: BSAD 134/ECON 134 and two from BSAD 135A, BSAD 136, BSAD 137, BSAD 138, BSAD 139
      (8) Management Information Systems: BSAD 170, BSAD 171, BSAD 173
      (9) Production Management: BSAD 121/STAT 121, and two from BSAD 122, BSAD 126, BSAD 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. Three concentrations are offered. Students are expected to 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)
   - 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, RLST 172

   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 050/CHN 050
   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 163, 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, RLST 171, RLST 172

   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 163, 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, RLST 171, RLST 172

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:
   - Any 8 units of AHS 017A, AHS 017B, and AHS 017C; or 4 units of AHS 017A, AHS 017B, or AHS 017C plus 4 units from any of the other departmental lower-division courses

2. Upper-division requirements:
   - Sixteen (16) upper-division units selected from the seven 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 Undergraduate Studies section of this catalog for additional information on minors.

GRADUATE PROGRAM
The graduate committee in Art History 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). While applications are accepted for entry in the winter or spring quarters, incoming students are encouraged to begin in the fall quarter, if possible. All applicants are required to submit their scores for the GRE General Test.

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-Am-
American Museum, the Huntington Library, and the dozens of other institutions in the area) and can receive course credit for doing so.

Course Work For the master's degree, 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), all students must take three graduate seminars in the department, one of which must be in their area of specialization and two of which must be in fields outside this area of specialization. Students can take as many units of AHS 297 and AHS 299 (thesis research and writing) as desired, but they may only use 12 of the units towards the 24 graduate units required for the degree. The remaining of the 40 total units can be satisfied with graduate or undergraduate upper-division course work.

Upon completion of the master's degree students are expected to have acquired an expertise in the area of their thesis specialization and, furthermore, a broad training in the areas offered by the department (Asian, Latin American, and the Euro-U.S. tradition, including courses in pre-modern [Ancient and Medieval], early modern [Renaissance and seventeenth and eighteenth centuries], and nineteenth, twentieth and twenty-first centuries). These courses should cover photography and architecture. During their first quarter of residency, students must confer with the graduate advisor about undergraduate preparation; the graduate advisor advises the students about whether to take additional undergraduate upper-division courses in areas of deficiency. Students must complete a successful oral discussion with thesis committee members at least one quarter before filing the thesis. They must file a completed, M.A.-level thesis within one year after completing all formal course work.

Language Requirement Students must demonstrate a proficiency in one language relevant to their area of study, preferably before entering the program, but definitely before the third quarter in residence. The relevant language is to be chosen in consultation with the graduate advisor and, if possible, the potential M.A. thesis advisor. This language requirement is meant to provide the student with a deep understanding of a foreign language such that the student can perform graduate level research in this language. Since most Ph.D. programs have additional language requirements, students planning to continue on 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, the student will, while enrolled as a graduate student, complete a UC language course equivalent to one of the following UCR classes, with a grade of "B" or better:

**LOWER-DIVISION COURSES**

- AHS 007. World Art: Images, Ideas, and Ideas. (4) Lecture, three hours; discussion, one hour; extra reading, two 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 artists, viewer, artistic tradition, and society.
- AHS 008. Modern Western Visual Culture. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. Focuses on broadly defined cultural practices—including painting, photography, video, architecture, and film—this course introduces the major historical, aesthetic, and theoretical issues in twentieth-century visual culture, with an eye toward political and social themes relevant to contemporary life. Cross-listed with FVC 008.
- Green, Jones

- AHS 009. Native American Art. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): none. This course is a comparative introduction to the material culture and art of Native North America. It will investigate architecture, dress, sculpture, and other material objects in the context of divergent pre-Columbian and modern aesthetics and belief systems. Cross-listed with ANTH 009.
- AHS 015. Arts of Asia. (4) Lecture, three hours; discussion, one hour; outside research, two 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.

**UPPER-DIVISION COURSES**

- AHS 017A. History of Western Art: Prehistoric to Byzantine. (4) Lecture, three hours; discussion, one hour; extra reading, two 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, Murphy
- AHS 017B. History of Western Art: Medieval to Renaissance. (4) Lecture, three hours; discussion, one hour; extra reading, two hours. Prerequisite(s): none. A survey of the visual arts of Europe in the Middle Ages and Renaissance. 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. Ostrow.
- AHS 018. Introduction to Writing and Painting in China. (4) Lecture, three hours; extra reading, two hours; written work, one 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. Hsu

- AHS 021. Introduction to Architecture and Urbanism. (4) Lecture, three hours; discussion, one 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 URBST 021. Morton

- AHS 027. Art of Pre-Columbian America. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): none. A survey 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, three hours; discussion, one hour; individual study, two 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 modernismo, and Chicano and Border art. Douglas

- AHS 030. Rome: The Ancient City. (4) Lecture, three hours; extra reading, three 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 GLA 017 and HIST 027.

- AHS 102. Anthropology of Art. (4) Lecture, three hours; outside research, three 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, three hours; extra reading, three hours. Prerequisite(s): AHS 009/ANTH 009 or AHS 027/ANTH 027 or upper-division standing or consent of instructor. Introduces 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, three hours; extra reading, three 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 transnational 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, three hours; extra reading, three 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 investi-
gates the relationships between European and Latin American developments.

**AHS 134. Art and Society: Patrons and Museums.** (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the production and reception of art. Topics include patronage, collecting, and audience for art in Renaissance Italy; modern American megapatrions, such as the Gettys and Rockefeller; and multimedia museum programs used to educate a wider public in the visual arts. Cross-listed with HISE 134.

**AHS 140. Chinese Painting of the Song and Yuan Dynasties.** (4) Lecture, three hours; extra reading, three 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. Hsü

**AHS 141. Chinese Painting of the Ming and Qing Dynasties.** (4) Lecture, three hours; extra reading, three 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. Hsü

**AHS 143.Text and Image in Chinese Painting.** (4) Lecture, three hours; extra reading, three 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. Hsü

**AHS 144. Japanese Painting: Twelfth to Nineteenth Century.** (4) Lecture, three hours; individual study, three 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 with the social and cultural contexts of painting, pictorial genres, and pivotal artists and styles. Cross-listed with AST 144. Hsü

**AHS 146. The Japanese House.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. The architecture, sculpture, painting, and minor arts 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 146. Morton

**AHS 147. The Art of Greece.** (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): AHS 015 or upper-division standing or consent of instructor. The architecture, sculpture, painting, and minor arts of Ancient Greece from the earliest Archais period through the Hellenistic age.

**AHS 148. The Art of Rome.** (4) Lecture, three hours; extra reading, three 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 154. Art of the Hellenistic Kingdoms.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AHS 017A or upper-division standing or consent of instructor. An examination of the sculpture, painting, and minor arts of the Mediterranean world from the empire of Alexander the Great through the death of Julius Caesar. Examines the transformations of the classical tradition, the creation of imperial imagery, and the connections between Greek, Etruscan, early Roman, and Eastern art.

**AHS 155. Cultures in Conflict: Art at the Fall of the Roman Empire.** (4) Lecture, three hours; individual study, three 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, three hours; individual study, three 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, three hours; extra reading, three 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 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, three hours; extra reading, three hours. Prerequisite(s): AHS 017B 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 159. Ostrow

**AHS 161. Italian Renaissance: Fifteenth- and Sixteenth-Century Florence.** (4) Lecture, three hours; outside research, three 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. Murphy

**AHS 162. Italian Renaissance: Fifteenth- and Sixteenth-Century Rome.** (4) Lecture, three hours; outside research, three 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. Murphy

**AHS 163. Italian Renaissance: Fifteenth- and Sixteenth-Century Venice and the Veneto.** (4) Lecture, three hours; outside research, three 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. Murphy

**AHS 164. The Northern Renaissance.** (4) Lecture, three hours; individual study, three 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. Murphy

**AHS 165. Women Artists in Renaissance Europe, 1400-1600.** (4) Lecture, three hours; individual study, three 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 women could 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 135 and WMST 170. Murphy

**AHS 166. Gender, Identity, and Visual Display in Washington, D.C.** (4) Lecture, three hours; extra reading, three 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 deco- rators in Washington. Cross-listed with WMST 166.

**AHS 171. Seventeenth-Century European Art.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): 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. Ostrow

**AHS 172. Baroque Rome.** (4) Lecture, three hours; individual study, three 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. Ostrow

**AHS 173. Eighteenth-Century European Art.** (4) Lecture, three hours; individual study, three 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 Neo-classicism. 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. Ostrow

**AHS 174. Science or Art?: A History of Nineteenth-Century Photography.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. A study of the development of photography from proto-photographic viewing devices through its formulation as an artistic medium around 1900. Emphasizes broad uses of photographic technologies in scientific, artistic, commercial, and political context. Cross-listed with FVC 177.

**AHS 176. Pictorialism to New Media: A History of Twentieth-Century Photography.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. A study of the development of photography from the present. Topics include pictorialist “art” photographs created around 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. Cross-listed with FVC 176.

**AHS 177. American Art: Colonial Period to 1900.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Painting and sculpture in the United States from the Colonial period to 1900. Cross-listed with FVC 177.

**AHS 180. Modern European Art I: Nineteenth Century.** (4) Lecture, three hours; individual study, three 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 portraitist “art” photographs created around 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. Cross-listed with FVC 176.
AHS 181. Modern Architecture. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Modern architecture and its sources from 1800. Cross-listed with URST 185. Morton

AHS 182. Visual Art and Visual Theory after 1945. (4) Lecture, three hours; individual study, three 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 postmodernism, analyzing work in relation to theories of representation and cultural identity. Jones

AHS 184. Modern Architecture. (4) Lecture, three hours; individual study, three 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 185. Morton

AHS 185. Architectural Theory from Vitruvius to Venturi. (4) Lecture, three hours; individual study, three 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 theories 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, three hours; screening, three hours. Prerequisite(s): AHS 017C or upper-division standing or consent of instructor. Focusing on key cultural movements or developments in Europe and the United States over the past century, gives 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 FVC 186.

AHS 187. Visual Culture and Art History. (4) Lecture, three hours; individual study, three 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 four conceptual areas: visuality, identity, media culture, and politics/ethics. Cross-listed with FVC 187.

AHS 189. Artsbridge. (1-5) Workshop, five hours per quarter; consultation, five hours per quarter; extra preparation or extra reading, three hours per week; field work, one and half hours to six hours per week. Prerequisite(s): consent of instructor; demonstrated ability or knowledge in the practice and production of the arts. Advanced assignments in k-12 arts outreach along with workshops to explore the pedagogical requirements for and teaching techniques to be used by Artsbridge scholars. For information on the Artsbridge program see department. Course is repeatable to a maximum of 16 units. Cross-listed with ART 189, CWR 189, DNCE 189, MUS 189, and THEA 189.

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, three hours; individual study, three 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 193H. Senior Honors Thesis. (1-4) Thesis, three to twelve hours. Prerequisite(s): admission to the University Honors Program or consent of the Art History Department. Requirements for the writing of a senior honors thesis completed under the supervision of a faculty member. Satisfaction (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 8 units.

AHS 198-1. 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). Repeatable to a total of 16 units.

AHS 251P. Proseminar in Methodology. (4) Seminar, three hours; outside research, three 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 art historical and archaeological traditions, and critically evaluates the theories of art history. 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. Forster-Hahn

AHS 260. Seminar in Latin American Art. (4) Seminar, three hours; outside research, two hours; term paper, one 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. Douglas

AHS 267. Seminar in Later Chinese Art. (4) Seminar, three hours; outside research, three hours; research paper, one hour. Prerequisite(s): graduate standing or consent of instructor. Special topics in later Chinese art. Course is repeatable as topics change. Hsu

AHS 271. Seminar in Ancient Art. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): AHS 271 or upper-division standing or consent of instructor. Selected issues of the function of art within ancient social, political, religious, and intellectual culture. Course is repeatable as topics change. Rudolph

AHS 272. Seminar in Medieval Art. (4) Seminar, three hours; outside research, three 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. Murphy

AHS 274. Seminar in Seventeenth- and Eighteenth-Century Art. (4) Seminar, three hours; outside research, two hours; term paper, one hour. Prerequisite(s): graduate standing or consent of instructor. Special topics in seventeenth- and eighteenth-century art. Course is repeatable as topics change. Drescher

AHS 276. Seminar in Nineteenth-Century Art. (4) Seminar, three hours; outside research, two hours; term paper, one 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. Forster-Hahn

AHS 277. Seminar in Twentieth-Century Art. (4) Seminar, three hours; outside research, two hours; term paper, one 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. Forster-Hahn

AHS 278. Seminar in Modern Architecture. (4) Seminar, three hours; outside research, three hours; research paper, one hour. 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. Jones

AHS 281. Seminar in History of Photography. (4) Seminar, three hours; outside research, three 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. Jones

AHS 299. 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) Research, three to twelve 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.

AHS 301. Directed Studies in the Teaching of the History of Art. (3) Seminar, two hours; consultation, one 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).
Asian Studies

Subject abbreviation: AST

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Committee in Charge
Eugene N. Anderson, Ph.D. (Anthropology)
Christopher Bolton, Ph.D. (Comparative Literature and Foreign Languages)
Robert W. Bullock, Ph.D. (Political Science)
Edward Chang, Ph.D. (Ethnic Studies)
Piya Chatterjee, Ph.D. (Women’s Studies)
Jingsong Chen, Ph.D. (Comparative Literature and Foreign Languages)
Lucille Chia, Ph.D. (History)
Kuei Chiu, M.A. (Rivera Library)
John W. Gioffi, M.A. (Political Science)
Michael Feener, Ph.D. (Religious Studies)
Yoshiko T. Hain, M.A. (Comparative Literature and Foreign Languages)
Ginger G. Hsi, Ph.D. (Art History)
Masako Ishii-Kuntz, Ph.D. (Sociology)
René T.A. Lysloff, Ph.D. (Music)
Ethan Nasreddin-Longo, Ph.D. (Music)
Vivian-Lee Nytray, Ph.D. (Religious Studies)
Lisa Raphael, Ph.D. (Comparative Literature and Foreign Languages)
Dylan Rodriguez, Ph.D. (Ethnic Studies)
Param Roy, Ph.D. (English)
Brian K. Smith, Ph.D. (Religious Studies)
Deborah A. Wong, Ph.D. (Music)
Yennu Wu, Ph.D. (Comparative Literature and Foreign Languages)
Yang Ye, Ph.D. (Comparative Literature and Foreign Languages)
Patricia O’Brien, 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 supplementing their work by participating in the Education Abroad Program offered through the University of California 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.

The major in Asian Studies provides two options. The East Asian Studies option centers on China, Japan, and Korea and the languages, histories, literatures, cultures, art, and religions of that particular region. The Comparative Asian Studies option is designed to allow students to take a broader perspective on Asian Studies by developing a comparative as well as an interdisciplinary approach to the study of different geographical and cultural areas within Asia. Students in these majors should consult with their advisors for program planning.

Asian Studies majors are well prepared either to enter graduate school or to pursue a career in one of the many walks of life that requires background in Asian languages, cultures, and communities, including business, government, and international affairs.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

The requirements for the B.A. degree in Asian Studies are as follows:

East Asian Studies Option

The East Asian Studies option is grounded in courses on China, Japan, and Korea and is supplemented by comparative course work on other Asian societies, including diaspora communities. Students who choose the East Asian Studies option are required to 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, or 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, or KOR 090 or its equivalents)

Note The CHN 001, CHN 002, CHN 003, and CHN 004 sequence, the JPN 001, JPN 002, JPN 003, and JPN 004 sequence, or the KOR 001, KOR 002, KOR 003, and KOR 004 sequence 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 courses:
   a) At least 28 units from the following
   b) AST 045E/HIST 045E
   c) At least 8 units from the following

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 130A/CHN 130A, AST 130B/CHN 130B, AST 135/CHN 135, AST 136/CHN 136, AST 140/AHS 140, AST 141/AHS 141, AST 142/CHN 142/RLST 142, AST 143/CHN 143, AST 144/CHN 144, AST 145/CHN 145, AST 151/CHN 151, AST 152 (E-Z)/AST 152 (E-Z), AST 169/MUS 169 (maximum of 4 units), AST 181/CPST 181/FAC 181/CHN 181, AST 185/CHN 185, 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 ECON 179 HIST 180, HIST 181, HIST 182, HIST 191W
      JPN 101A, JPN 101B, JPN 101C, 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:
   a) ART 128/ANTH 128/DNCE 128/ML 128 THEA 176, AST 190, AST 195, CPT 141, CPT 143/FREN 143, CPT 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 156

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 Comparative Asian Studies option is designed for students who wish to pursue a comparative approach to Asian Studies. 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 courses:
AHS 015, AST 018/AHS 018,
AST 022/FVC 022/JPN 022/WRT 022,
AST 030/CHN 030, AST 034/JPN 034
AST 040/CHN 040, AST 045 (E-Z)/
HIST 045 (E-Z), AST 090
ETST 005, ETST 005H
HASS 021A, HASS 021B, HASS 021C
HIST 030, HIST 044/RST 044
JPN 035
RST 005, RST 005H
WRT 029

2. Upper-division requirements (36 units)

a) At least 12 units from the following courses:
AHS 015, AST 018/AHS 018, AST 022/
FVC 022/JPN 022/WRT 022,
AST 030/CHN 030, AST 034/JPN 034,
AST 040/CHN 040, AST 045 (E-Z)/
HIST 045 (E-Z)

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/
RST 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 145B, ETST 145C,
ETST 144, ETST 150, SOC 136

(2) China: AST 107/CHN 107/
RST 107, AST 140/AHS 140,
AST 141/AHS 141, AST 142/
CHN 142/RST 142, AST 143/
AHS 143, AST 130A/CHN 130A,
AST 130B/CHN 130B,
AST 135/CHN 135,
AST 136/CHN 136,
AST 148/CHN 148,
AST 185/CHN 185, CHN 105,
CHN 108, CHN 110 (E-Z),
CHN 115 (E-Z), CHN 190,
ECON 179, HIST 180, HIST 181,
HIST 182, HIST 191W, RST 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 160/MUS 160 (4 units maximum),
AST 176/CHN 176 (4 units maximum),
CHN 180, CHN 184/JPN 184,
JPN 190, RST 105

(4) Southeast Asia: ANTH 140-I,
AST 127/ANTH 176/DNCE 127/
ETST 172/MUS 127, 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, AST 168/
MUS 168 (4 units maximum),
AST 170/MUS 170 (4 units maximum)

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

LOWER-DIVISION COURSES

AST 018. Introduction to Writing and Painting in China. (4) Lecture; three hours; extra reading, two hours; written work, one 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; three hours; screening, three 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 FVC 022, JPN 022, and WRT 022.

AST 030. Introduction to Chinese Civilization. (4) Lecture; two hours; discussion; one hour; extra reading; three 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. Audio/visual media is used. All work is done in English. Cross-listed with CHIN 030.

AST 034. Early Japanese Literature. (4) Lecture, three hours; term paper, three 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, three hours; outside research, three 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, three hours; consultation, one hour. Prerequisite(s): none. An introduction to regional histories and cultures of Japan, China, Korea, and India. Cross-listed with HIST 045 (E-Z).

AST 048. Chinese Cinema. (4) Lecture, two hours; discussion, one hour; screening, two hours; outside research, one 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 interrelationships with theatre, photography, and literature? How do we understand the film as an art form? Cross-listed with CHN 048.

AST 090. Special Studies. (1-5) Individual study, three to fifteen 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, three hours; individual study, three hours. Prerequisite(s): AST 030; CHIN 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 CHIN 107 and RST 107.

AST 124. Music of Asian America. (4) Lecture, three hours; music listening, one hour; individual study, two 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 127. Music Cultures of Southeast Asia. (4) Lecture, three hours; extra reading, three 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, DNGE 127, ETSY 172, and MUS 127.

AST 128. Performing Arts of Asia. (4) Lecture, three hours; extra reading, three 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, DNGE 128, MUS 128, and THA 176.

AST 130A. Chinese Literature in Translation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Knowledge of Chinese not required. Involves lectures and collateral reading of representative works in English and translation. Covers poetry, historical records, essays, drama, and fiction from Earliest Times to the Yuan Dynasty (1368 A.D.). Can be taken out of sequence. Cross-listed with CHN 130A.

AST 130B. Chinese Literature in Translation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Knowledge of Chinese not required. Involves lectures and collateral reading of representative works in English and translation. Covers drama and fiction from the fourteenth century to the end of the Qing Dynasty (1911 A.D.). Can be taken out of sequence. Cross-listed with CHIN 130B.

AST 135. Great Novels of China. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): 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. 900-1367). The development of themes, subjects, styles, theories, and purposes discussed in their cultural and historical contexts. Cross-listed with AST 135.

AST 136. Family and Gender in the Chinese Short Story. (4) Lecture, three hours; extra reading, three 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.

AST 140. Chinese Painting of the Song and Yuan Dynasties. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): AST 015 or upper-division standing or consent of instructor. The history of early Chinese painting, from Earliest Times to the Yuan century, with concentration on the Song and Yuan dynasties (A.D. 900-1367). The development of themes, subjects, styles, theories, and purposes discussed in their cultural and historical contexts. Cross-listed with CHIN 140.

AST 141. Chinese Painting of the Ming and Qing Dynasties. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): AST 015 or equivalent or upper-division standing or consent of instructor. The history of late 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.

AST 142. Chuang-tzu. (4) Lecture, one hour; discussion, two hours; outside research, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): AST 005 or AST 006 or AST 107; CHIN 107 or RST 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 Chinese Taoist texts, the Chuang-tzu. Discussion of the structure and style of a number of masterpieces. Students with knowledge of classical Chinese may arrange additional work through special studies. Cross-listed with CHIN 142 and RST 142.

AST 143. Text and Image in Chinese Painting. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): AST 015 or upper-division standing or consent of instructor. A close examination of the relationship between written language and pictorial image. Reading knowledge of the Chinese language is not necessary. Cross-listed with AST 143.

AST 144. Japanese Painting: Twelfth to Nineteenth Century. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AST 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 social and cultural contexts of painting, pictorial genres, and pivotal artists and styles. Cross-listed with AST 144.

AST 147. The Japanese House. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AST 015 or upper-division standing or consent of instructor. History of the traditional Japanese house from prehistoric times to the nineteenth century. Emphasis on the social and cultural context of the Japanese house within the general history of Japanese architecture and within its social and cultural context. Cross-listed with AST 146.

AST 148. Chinese Poetry and Poetics in Translation. (4) Lecture, two hours; discussion, one hour; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines 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 CHIN 148.

AST 151. Early Japanese Literature. (4) Lecture, two hours; discussion, one hour; term paper, three 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. Cross-listed with JPN 151.

AST 152 (E-Z). Themes in Modern Japanese Literature. (4) Lecture, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to modern Japanese literature in translation, 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 Dreams and Other Virtual Worlds. Cross-listed with JPN 152 (E-Z).

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) only, 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, two hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of Japanese drumming. Normally graded Satisfactory (S) or No Credit (NC) only, 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, two to four hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of the Filipino rondalla, an ensemble consisting of various sizes of jale-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 Film and Visual Culture. (4) Lecture, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates popular visual culture in Japan primarily through film, from the early masters to contemporary directors. Additional material may be drawn from fields such as theatre, television, visual art, architecture,
BIOCHEMISTRY

Subject abbreviation: BCH

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Cooperating Faculty
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Timothy J. Close, Ph.D. (Botany and Plant Sciences)
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MAJOR

Biochemistry holds a central position in the life sciences. At the interface between Biology and Chemistry, it deals with the molecular structures and reactions essential to all life processes. A degree in Biochemistry prepares students for a broad range of career possibilities in research, industry, and the health professions. In the past decade, a third of our graduates have entered professional schools (medical, dental, optometry, pharmacy, osteopathy, and veterinary), a third have entered M.S. or Ph.D. graduate programs (in Biochemistry, Physiology, Public Health, Pathology, Molecular Biology, and Virology). The remaining third have gone to work (in the pharmaceutical and biotechnology industries, clinical and research laboratories, and teaching).

The course work required for the Biochemistry degree is rigorous and comprehensive, and gives students a solid grounding on which to base their career goals. There are two emphasis areas within the Biochemistry major: Chemistry and Biology. The choice of emphasis depends on the career plans of the student, and determines from which course groupings upper-division electives are selected to complete the major requirements. The Biology emphasis is geared toward students interested in the health professions, while the Chemistry emphasis is generally chosen by students interested in pharmacy, forensics, or biophysical sciences. The program focuses 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 possible. 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 a equivalency level of a foreign language (see College Breadth Requirements).

Transfer Students

Transfer students majoring in Biochemistry need to 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 009C
2. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C
3. Organic chemistry (must be completed with a minimum grade of "B" in each term)
4. General biology, equivalent to BIOL 005A, BIOL 051A, 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.

Degree 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.

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 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.
1. Lower-division requirements (51 units)
   a) BIOL 005A, BIOL 055A, BIOL 005B, BIOL 055C
   b) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 021A, PHYS 021B, PHYS 021C
   c) CHEM 001A, CHEM 001B, CHEM 001C
   d) MATH 009A, MATH 009B, MATH 009C

2. Statistics requirement (2 or 5 units): One course from STAT 020, STAT 100A, or STAT 105

3. Upper-division requirements (46–49 units)
   a) BIOL 102
   b) CHEM 109 or CHEM 110A; CHEM 112A, CHEM 112B, CHEM 112C
   c) BCH 102, BCH 110A, BCH 110B, BCH 110C, BCH 184
   d) Two courses from BCH 120/BMSC 120, BCH 153/BMSC 153, BCH 162, BCH 183, BCH 185/BPSC 185, BCH 210, BCH 211, BCH 212, BCH 241/CHEM 241
   e) 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
   a) Lower-division requirements (5 units): CHEM 005
   b) Upper-division requirements (8 units): two courses from CHEM 100B, CHEM 113, CHEM 125, CHEM 150A–CHEM 150B, CHEM 166 (BCH 241/CHEM 241 and other graduate courses may be substituted by students with a GPA of 3.0 or better with permission of the instructor and the faculty advisor.)

Biology Emphasis
   a) Upper-division requirements (9–15 units). Choose three biological science courses from the following:
      (1) BCH 120/BMSC 120, BCH 153/BMSC 153, BCH 162, BCH 183, BCH 185/BPSC 185, BCH 210, BCH 211, BCH 212, BCH 241/CHEM 241
      (2) BIOL 105, BIOL 108, BIOL 114, BIOL 117, BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 121L/MCBL 121L, BIOL 128/CBNS 128, BIOL 151, BIOL 155/BPSC 155, BIOL 157, BIOL 159/NEU 159, BIOL 160, BIOL 161A, BIOL 161B, BIOL 167, BIOL 171, BIOL 173/ENTM 173, BIOL 175, BIOL 176, CBNS 101, CBNS 150/ENTX 150
      (3) BIOL 104/BPSC 104, BIOL 132/BPSC 132, BIOL 143/BPSC 143, BIOL 155/BPSC 155, BPSC 134, BPSC 135, BPSC 148

   (4) BIOL 100/ENTM 100, BCH 173/ENTM 173, ENTM 128
   (5) CBNS 106, CBNS 116, CBNS 120/PSYC 120, CBNS 120L/PSYC 120L, CBNS 124/PSYC 124, CBNS 125/CPSY 125, CBNS 169
   (6) ENSC 100, ENSC 155
   (7) CBNS 150/ENTX 150, ENTX 101

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.

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.

Sample Programs
Two of the many possible course programs are shown below: the outlined program is applicable for both the B.A. and B.S. degree programs. The sequence ENGL 001A, ENGL 001B, and ENGL 001C should be completed as early as possible in the student’s career. BCH 190 Special Studies or BCH 197 (Research for Undergraduate Students) is completed during the junior or senior year and may be arranged through the Undergraduate Student Advisor.

Biology Emphasis
   a) Freshman Year
      Fall Winter Spring
      CHEM 001A, CHEM 001B, 4 4 4
      BIOL 005A, BIOL 055A, BIOL 005B 4 4 4
      MATH 009A, MATH 009B, 4 4 4
      CHEM 005, Hum./Soc., 4 4 4
      Total Units: 12 16 16
   b) Sophomore Year
      Fall Winter Spring
      CHEM 112A, CHEM 112B, CHEM 112C, 4 4 4
      PHYS 002A, PHYS 002B, PHYS 002C 4 4 4
      PHYS 002A, PHYS 002B, PHYS 002C 1 1 1
      BIOL 005C, Hum./Soc., 4 4 4
      General Electives 4 4 4
      Total Units: 15 18 18
   c) Junior Year
      Fall Winter Spring
      BIOL 109 or CHEM 110A, 4 4 4
      CHEM 109 or CHEM 110A, 4 4 4
      CHEM 109 or CHEM 110A, 4 4 4
      Total Units: 15 16 16
   d) Senior Year
      Fall Winter Spring
      CHEM 100 or CHEM 110B, 4 4 4
      CHEM 100 or CHEM 110B, 4 4 4
      CHEM 100 or CHEM 110B, 4 4 4
      Total Units: 15 16 16

Graduate Program
The Department of Biochemistry offers a graduate program leading to the M.S. or Ph.D. degree in Biochemistry and Molecular Biology. This program emphasizes basic biochemistry with research specializations in the areas of molecular biology, physical biochemistry, molecular endocrinology, plant biochemistry and molecular biology, signal transduction, and biomedical research. It is designed for students who are planning a career of research and teaching in biochemistry at colleges and universities or who wish to engage in biochemical investigations of fundamental or applied nature in private, governmental or commercial laboratories.

Students who have completed a bachelor’s degree in physical, biological, chemical, or agricultural sciences are invited to apply to the
oral defense of the dissertation. As part of the student's work, and students conclude their studies with an oral qualifying examination; students completing their Ph.D. degree normally enter the graduate program in Biochemistry and Molecular Biology should arrange to take the GRE General Test in time for their scores to be submitted with their application.

Doctoral Degree

Students' course requirements are determined in consultation with a three-member advisory committee appointed for them upon their arrival. Prior to enrollment, entering students are given a written comprehensive evaluation examination in biochemistry. The results of this examination are only used for advising and placement; a passing score is not a requirement for admission or enrollment. On the basis of the student's interests, previous training, and performance on the comprehensive evaluation examination, the advisory committee suggests an individualized course program involving classes in biochemistry and subsidiary fields of study. These subsidiary fields may be chosen from any of the physical, biological, or agricultural sciences. Although an adequate course preparation is a requisite part of the training program, the department encourages early involvement of the students in research directed toward their dissertations. Students who are candidates for the Ph.D. degree normally enter the graduate program in the fall quarter at the beginning of a new academic year and begin their training according to the plan suggested by their individual advisory committees. At the end of the first quarter, the students select their major professors and are ready to initiate a research project. At the end of the first year, the students submit a written report describing their research efforts and relating them to current biochemical work in related areas. After the second year, students take a comprehensive written qualifying examination, then submit and orally defend a research report in which they describe the research they have performed thus far and develop a plan for their complete dissertation research project. This fulfills the Graduate Division's requirement for an oral qualifying examination; students completing these requirements are advanced to candidacy for the Ph.D. degree. Following completion of their research, a written dissertation is submitted, and students conclude their studies with an oral defense of the dissertation. As part of the program, each student is required to serve at least two quarters as a teaching assistant.

Normative Time to Degree

15 quarters

Master's Degree

In addition to the Ph.D. program, the department offers two plans for the master's degree: (Plan I — Thesis; Plan II — Comprehensive Examination). Both plans require completion of at least 36 course units; for Plan I, a maximum of 12 units may be for thesis research.

LOWER-DIVISION COURSES

BCH 010. Introduction to Nutrition. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. Introduction to the biological basis of human nutrition in the context of plant-animal-microorganism cycles and the characteristics of different food classes. The effects of nutritional needs, food availability, and the expanding human population are discussed. Students record and evaluate their own diet.

BCH 097. Research Tutorial in Biochemistry. (1) Laboratory, three hours. Prerequisite(s): lower-division standing, minimum pre-pharmacy GPA of 3.5, approval of undergraduate advisor and consent of instructor. Laboratory tutorial in Biochemistry. To provide biochemistry laboratory experience for exceptional lower-division students. A written report is required at the end of each quarter. Graded Satisfactory (S) or No Credit (NC). The course may be repeated for up to 3 units.

UPPER-DIVISION COURSES

BCH 100. Elementary Biochemistry. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 009C; CHEM 112C (CHEM 112C may be taken concurrently). An introduction to the chemistry and molecular biology of living organisms based on a study of the structure, function, and metabolism of small molecules and macromolecules of biological significance. Examines selected animals, plants, and microorganisms to develop a general understanding of structure-function relationships, enzyme action, regulation, bioenergetics, intermediary metabolism, and molecular biology. Credit is not awarded for BCH 100 if it has already been awarded for BCH 110A, BCH 110B, or BCH 110C.

BCH 102. Introductory Biochemistry Laboratory. (4) Lecture, two hours; laboratory, two 4-hour laboratories. Prerequisite(s): BCH 100 with a grade of "C-" or better or BCH 110A with a grade of "C-" or better of consent of instructor. Introduction to biochemistry laboratory techniques including spectroscopy, pH and buffer preparation, methods of protein determination, principles and uses of chromatography, enzyme assay, theory and measurement of radioisotopes (liquid scintillation counting), SDS-gel electrophoresis, theory of centrifugation. Most experiments include a quantitative component upon which the student's performance is graded.

BCH 110A. General Biochemistry. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 009B, CHEM 112C; MATH 009B or MATH 09HB. Consideration of the structure and function of biological molecules including proteins, carbohydrates, lipids, and nucleic acids.

BCH 110B. General Biochemistry. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BCH 110A with a grade of "C-" or better of consent of instructor. Consideration of metabolic pathways including mechanisms and regulation of catabolism, anabolism, and bioenergetics in living organisms.

BCH 110C. General Biochemistry. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BCH 110A with a grade of "C-" or better or BCH 110B with a grade of "C-" or better or consent of instructor; BIOL 102 or concurrent enrollment in BIOL 115 or consent of instructor. Consideration of regulation of gene expression, genome replication, recombination, and repair.

BCH 120. General Biochemistry Related to Biomedical Sciences. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BCH 100 with a grade of "C-" or better or BCH 110B with a grade of "C-" or better of 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. Although the course is designed specifically for the curriculum of the Biomedical Sciences Program, it may be appropriate for students in other departments. Cross-listed with BMSC 120.

BCH 153. Plant Genomics and Biotechnology Laboratory. (4) F, Odd Years. Lecture, one hour; discussion, one hour; laboratory, six 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; regulatory issues. Cross-listed with BIOL 153F and BPSB 153. Credit is awarded for only one of BCH 153/Biol 153/BPSB 153 or BIOL 109.

BCH 162. Biochemistry and Molecular Biology Laboratory. (5) Lecture, one hour; discussion, one hour; laboratory, two 4-hour laboratories. Prerequisite(s): BCH 102; BCH 110A, BCH 110B, BCH 110C; all with grades of "C-" or better or 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, immunoblotting, peace extraction, affinity chromatography, and gel shift assays.

BCH 183. Plant Biochemistry. (3) Lecture, three hours. Prerequisite(s): BCH 110A, BCH 110B; or BCH 100. 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.

BCH 184. Topics in Physical Biochemistry. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BCH 100 with a grade of "C-" or better or BCH 110A with a grade of "C-" or better; CHEM 112C and either CHEM 109 or CHEM 110A; or consent of instructor. Lectures on the application of spectroscopy, imaging, and other physical methods in biochemistry including study of macromolecular structure, nuclear acid-protein interactions, subcellular structures, bioenergetics, mechanisms of enzymatic catalysis, enzyme kinetics, and metabolism.

BCH 185. Molecular Evolution. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 108 recommended. Explores the evolution of genes, proteins, and genomes at the molecular level. The focus is on the processes that drive molecular evolutionary change. Attention is also given to the analysis of molecular data within the framework of evolutionary theory. Cross-listed with BPSB 185.

BCH 188. Introduction to Oral Presentations. (1) Lecture, one hour. Prerequisite(s): junior or senior standing; consent of instructor. Gives science students practice in oral presentations and formal talks. Includes faculty lectures and short presentations by students. Instructs students in the electronic preparation of figures and tables.
GRADUATE COURSES

BCH 210. Biochemistry of Macromolecules. (4) Lecture, four 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 selected topics in the area of biochemical and molecular biology 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; transgenes; genes in transgenes and protein targeting.

BCH 212. Signal Transduction and Biochemical Regulation. (3) Lecture, two hours; discussion, one hour. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents; graduate standing or consent of instructor. Discussion of signal transduction and biochemical regulation. Some topics covered include the following: molecular anatomy of the signal transduction mechanism, signal transducers and effectors, signal transduction cascades, signal transduction pathways, and signal transduction networks.

BCH 230 (E-Z). Advanced Topics in Biochemistry. (2) Lecture, one hour; discussion, one hour; outside reading, two to four hours. Prerequisite(s): BCH 100 or both BCH 110A and BCH 110B or consent of instructor. A series of courses which may be entered in any quarter. Each course considers the most recent advances in the particular field by analysis of the recent literature.

BCH 231. The Plant Genome. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BCH 100, BIOI 107A; or BCH 110A, BCH 110B, BCH 110C; or consent of instructor. Advanced topics in the area of plant genetics and genomics, including the structure and function of plant genes, regulation of gene expression, and the role of gene regulation in plant development.

BCH 240. Special Topics in Biochemistry. (2) Lecture, two hours. Prerequisite(s): BCH 110A, BCH 110B, BCH 110C or equivalents (may be taken concurrently); graduate standing or consent of instructor. Discussion of selected topics in the area of biochemistry, including recent developments in the field of biochemistry.

BCH 250. Oral Presentations in Biochemistry. (2) Seminar, one hour; discussion, one hour. Prerequisite(s): graduate standing. Students submit presentation topics prior to the seminar and present their research findings in a series of seminars.

BCH 251. Graduate Seminar in Biochemistry. (1) Seminar, one hour; discussion, one hour. Prerequisite(s): BCH 250. Oral reports by graduate students on current research topics in biochemistry.

BCH 252. General Seminar in Biochemistry. (1) Seminar, one 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. Colloquium in Recombinant DNA. (1) Seminar, one hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty and students on current research topics in recombinant DNA. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BIOI 261, BSBC 261, ENTM 261, and PLPA 261.

BCH 264. Seminar-Tutorial in Physical Biochemistry. (2) Seminar, one hour; discussion, one 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 287. Colloquium in Neuroscience. (1) Colloquium, one hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports on current research topics in neuroscience with discussions by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BIOI 287, BSBC 287, CHEM 287, NSRC 287, and PSY 287.

BCH 289. Special Topics in Neurosciences. (2) Seminar, two hours. Prerequisite(s): graduate standing or consent of instructor. Discussion of selected topics in the area of neurosciences. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BIOI 289, BSBC 289, CHEM 289, ENTM 289, NSRC 289, and PSY 289.

BCH 290. Directed Studies. (1-4) Outside research, 5 to 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. Prior approval of the graduate advisor, M.S. students may be assigned a letter grade; otherwise students are graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BCH 291. Individual Study in Biochemistry. (1-6) Directed research, 1 to 6 units. Prerequisite(s): graduate standing in Biochemistry; consent of instructor and graduate advisor. Directed research with a staff member. Prior approval of the program advisor, M.S. students and 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, one hour. Prerequisite(s): graduate standing and consent of instructor. A program of weekly meetings and individual formative evaluations.

R. Macromolecular Architecture
S. Steroid Metabolism
T. Tumor Suppressor and Cell Cycle Regulation
V. Signal Transduction
W. Biochemistry of Fertilization and Early Development
X. Symmetry in Biological Systems

B. Macromolecular Architecture
C. Steroid Metabolism
D. Tumor Suppressor and Cell Cycle Regulation
E. Signal Transduction
F. Biochemistry of Fertilization and Early Development
G. Symmetry in Biological Systems

B. Macromolecular Architecture
C. Steroid Metabolism
D. Tumor Suppressor and Cell Cycle Regulation
E. Signal Transduction
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D. Tumor Suppressor and Cell Cycle Regulation
E. Signal Transduction
F. Biochemistry of Fertilization and Early Development
G. Symmetry in Biological Systems
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 gradu-ate 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.

BIological SCIENCES

Subject abbreviation: BLSC

Carol J. Lovatt, Ph.D., Chair
Program Office, 1001 Batchelor Hall North
(909) 787-3579

Committee in Charge
Janet T. Arex, Ph.D. Environmental Toxicology
Roger D. Farley, Ph.D. Biophysics
Dennis D. Focht, Ph.D. Microbiology
Bradley C. Hyman, Ph.D. Bioinformatics and Genomics
Carol J. Lovatt, Ph.D. Plant Biology
Manuela Martins-Green, Ph.D. Cell, Molecular, and Developmental Biology
Thomas A. Miller, Ph.D. Cell, Molecular, and Developmental Biology
Richard A. Redak, Ph.D. Entomology
David N. Reznick, Ph.D. Evolution and Ecology
William E. Walton, Ph.D. Conservation Biology
Mark A. Chappell, Ph.D.
Associate Dean, College of Natural and Agricultural Sciences, ex officio

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

MAJOR

Biological Sciences is an interdepartmental major drawing on more than 100 faculty from several departments (see list above) and offers the B.S. degree. The major is unified by a core curriculum and provides nine areas of specialization (tracks): Bioinformatics and Genomics; Biology; Cell, Molecular and Developmental Biology; Conservation Biology; Evolution and Ecology; Environmental Toxicology; Microbiology; and Plant Biology. Each track provides the opportunity to combine broad basic training in biological sciences with emphasis in an area of particular interest to the student.

The track structure allows organized programs of instruction that could not be provided by a single department, and it is anticipated that the Biological Sciences major will replace several departmentally based majors. Thus, both new and continuing students are encouraged to consider the benefits of this major.

Because the core curriculum occupies most of the first two years of study, Biological Sciences majors need not select their area of specialization (track) until the beginning of the junior year. However, students are encouraged to identify a track sooner if they so desire.

Transfer Students

Transfer students majoring in Biological Sciences need to complete at least three of the following full-year sequences, which must include general chemistry:

1. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C
2. First-year calculus, equivalent to MATH 009A, MATH 009B
3. General biology, equivalent to BIOL 005A, BIOL 05LA, and BIOL 005B (and BIOL 005C, if available
4. 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.

Degree 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 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. Biological Sciences core requirements (65-68 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 112A, CHEM 112B, CHEM 112C
   c) MATH 009A, MATH 009B
   d) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 021A, PHYS 021B, PHYS 021C
   e) STAT 100A or STAT 105 or STAT 120A
   f) BCH 110A or BCH 110B
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. The fields are firmly placed at the “center stage” of contemporary biological science, often being referred to as the new Biology “...after the human genome.” 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 required 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,
The Biology track provides up-to-date preparation for postgraduate study and careers in health science, teaching and research. These options require understanding and integration of the different levels of biological organization: cellular/molecular, development, structure and function of organisms, ecology, and population. An overview of processes at all these levels is presented in the introductory courses (BIOL 005A, BIOL 05LA, BIOL 055B, 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 cellular/molecular biology, three 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/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.

The biology track provides a foundation in the main subfields of biology and thus prepares students for more specialized study before and after graduation. Courses in this track enable students to test their interest and aptitude, so that further specialization and career choices are based on information and experience. Students may decide to transfer to another more specialized track or major, or continue in the biology track, taking additional course work to strengthen areas of interest. Additional upper-division courses may be taken in any of the required fields of the track, and a list of elective biology courses is provided below:

### Biology Track

**Required Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>BIOL 102 or BIOL 115</td>
<td>Introduction to Ecology and Evolution</td>
</tr>
<tr>
<td>BIOL 107B or BIOL 110</td>
<td>Advanced Organismal Biology</td>
</tr>
<tr>
<td>BIOL 168, BIOL 185 (E-Z)</td>
<td>Population and Community Dynamics</td>
</tr>
<tr>
<td>BIOL 191, ENTX 150/150B</td>
<td>Animal Behavior</td>
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### Statistics/Computer Science Requirement

- **Statistics**
- **Computer Science**

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<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>CS 010, CS 012, CS 054, CS 061, CS 079A/EE 120A, CS 145/EE 143</td>
<td>Statistics for Biological Sciences</td>
</tr>
<tr>
<td>STAT 100A, STAT 100B, STAT 120A, STAT 120B</td>
<td>Computer Science for Biological Sciences</td>
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</tbody>
</table>

### Additional Courses

- **Eco/Evolution/Behavior**
- **Additional Electives**

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<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B</td>
<td>Introduction to Ecology and Evolution</td>
</tr>
<tr>
<td>BIOL 121C/MCBL 121C</td>
<td>Advanced Ecological Techniques</td>
</tr>
<tr>
<td>BIOL 134, PLPA 134L/BIOL 134L</td>
<td>Ecology and Conservation</td>
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<tr>
<td>CBNS 116, CBNS 120/PSYC 120</td>
<td>Behavioral Neuroscience</td>
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<tr>
<td>BIOL 143</td>
<td>Advanced Animal Behavior</td>
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<tr>
<td>BIOL 157</td>
<td>Advanced Animal Physiology</td>
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<tr>
<td>BIOL 167</td>
<td>Advanced Mammalian Anatomy</td>
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<tr>
<td>BIOL 171</td>
<td>Advanced Plant Physiology</td>
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<tr>
<td>BIOL 175</td>
<td>Advanced Animal Physiology</td>
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<tr>
<td>BIOL 177</td>
<td>Advanced Plant Physiology</td>
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<tr>
<td>BIOL 179</td>
<td>Advanced Animal Physiology</td>
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<tr>
<td>BIOL 185</td>
<td>Advanced Plant Physiology</td>
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<tr>
<td>BIOL 191</td>
<td>Animal Behavior</td>
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<tr>
<td>ENTX 150/150B</td>
<td>Animal Behavior</td>
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### Elective Courses

- **Upper-division requirements**
- **Additional Elective Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>36 units from the following, including two upper-division lecture courses with lecture component</td>
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<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>BIOL 102 or BIOL 115</td>
<td>Advanced Animal Physiology</td>
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<tr>
<td>BIOL 107B or BIOL 110</td>
<td>Advanced Plant Physiology</td>
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<tr>
<td>BIOL 119</td>
<td>Advanced Animal Physiology</td>
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<tr>
<td>BIOL 121B/MCBL 121B</td>
<td>Introduction to Ecology and Evolution</td>
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<tr>
<td>BIOL 121C/MCBL 121C</td>
<td>Advanced Ecological Techniques</td>
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<tr>
<td>BIOL 134, PLPA 134L/BIOL 134L</td>
<td>Ecology and Conservation</td>
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<tr>
<td>CBNS 116, CBNS 120/PSYC 120</td>
<td>Behavioral Neuroscience</td>
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<tr>
<td>BIOL 143</td>
<td>Advanced Animal Behavior</td>
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<td>BIOL 157</td>
<td>Advanced Animal Physiology</td>
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<td>BIOL 167</td>
<td>Advanced Mammalian Anatomy</td>
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<td>BIOL 171</td>
<td>Advanced Plant Physiology</td>
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<td>BIOL 175</td>
<td>Advanced Animal Physiology</td>
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<td>BIOL 177</td>
<td>Advanced Plant Physiology</td>
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<td>BIOL 179</td>
<td>Advanced Animal Physiology</td>
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<td>BIOL 185</td>
<td>Advanced Plant Physiology</td>
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<td>BIOL 191</td>
<td>Animal Behavior</td>
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<tr>
<td>ENTX 150/150B</td>
<td>Animal Behavior</td>
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</table>

**Note**: Independent study or research in the field of bioinformatics or genomics is recommended.
2. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52. Must include at least 8 units not listed above.

**Conservation Biology Track**

Conservation biology is a new scientific discipline that 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 under 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, soil science, geography, and other disciplines, will be prepared for careers in conservation science, education, preserve management, policy making, consultancy, science writing, and others. The Conservation Biology track prepares students for not only careers in the public (local, state, and federal governments) and private conservation industry but also graduate studies in conservation science.

1. **Additional lower-division requirements**
   a) ENSC 006/ECON 006  
   b) GEO 002  

2. **Upper-division requirements**
   a) BIOL 102  
   b) ENSC 172  
   c) Breadth Electives: Courses in the disciplines important in Conservation Biology (one course from each of the following areas)
      1. Evolution  
         BIOL 105, BIOL 108  
      2. Ecology  
         BIOL 117, BIOL 127/ENTM 127,  
         BPSC 146  
      3. Systematics  
         ENTM 112/BIOL 112/BPSC 112,  
         BPSC 144  
      4. Biodiversity  
         BIOL 151, BIOL 163,  
         BPSC 104/BIOL 104, ENTM 100/  
         BIOL 100, ENTM 109,  
         PLPA 134/BIOL 134 and  
         PLPA 134L/BIOL 134L, or other  
         appropriate course that includes a  
         laboratory and is approved by a fac-  
         ulty advisor  
      5. Abiotic and Landscape Studies  
         ENSC 100, GEO 160, GEO 162,  
         GEO 168A  
      6. Applications  
         BPSC 165/BIOL 165, ENTM 124,  
         ENTM 129, GEO 167  
      7. Human Issues  
         ANTH 110, ANTH 129, ANTH 132,  
         ANTH 134, ECON 143A/ENSC 143A,  
         ECON 143B/ENSC 143B, PHIL 117,  
         SOC 184  
      d) Specialization: 12 units of upper-division and/or substantive courses in an area of specialization chosen by the student in consultation with a faculty advisor.  
      e) Conservation Internship Program (minimum of 2 units): BLCN 198-I  
      f) Conservation Biology Seminar: BLCN 195 must be taken once.

**Entomology Track**

Entomology is an independent scientific discipline strongly rooted in the biological sciences. It is the study of insects, involving their ecology, physiology, behavior, and often their control in relation to their environment and to man. Since insects are human’s greatest competitors for natural resources, applied scientists with an entomology background are involved in reducing harmful species of insects that destroy food, housing, plants, clothing, or cause disease to humans and livestock. Others may develop methods to increase the number and spread of insects that provide food, pollinate crops, or control harmful insects. Entomologists also are able to use insects to answer basic research questions in the fields of behavior, ecology, toxicology, genetics, evolution, physiology, and molecular biology, just to name a few. Students earning a bachelor’s degree in Biological Sciences under the Entomology track will be trained and prepared for several technical career options including pest control advisors and consultants, survey entomologists, laboratory and field biological technicians and consultants, and agricultural inspectors within both the public (local, state, and federal governments) and private sectors. Additionally, students specializing in the Entomology track will be prepared to continue their studies at the graduate level, teach (for secondary level see Biology track) or in a professional school (medicine, dentistry, veterinary medicine, optometry).

1. **Upper-division required courses**
   a) BCH 100  
   b) BIOL 102, BIOL 151  
   c) BPSC 104/BIOL 104  
   d) ENTM 100/BIOL 100,  
      ENTM 112/BIOL 112/BPSC 112,  
      ENTM 127/BIOL 127,  
      ENTM 173/BIOL 173  

2. **Additional upper-division requirements**
   (at least 6 units from the following)
   
   ENTM 109, ENTM 114, ENTM 124,  
   ENTM 126, ENTM 126L, ENTM 128,  
   ENTM 129, ENTM 129L, ENTM 132,  
   ENTM 133, ENTM 162/BIOL 162,  
   ENTM 190, ENTM 197 [no more than three units of ENTM 190 and ENTM 197 (in combination) may be taken toward fulfilling this requirement]  

3. **Related areas**
   (at least 7 units from the following)
   
   a) Agriculture  
      BPSC 143/BIOL 143, BPSC 150,  
      BPSC 158, BPSC 166, ENSC 100,  
      ENSC 131, NEM 120, NEM 159/  
      BIOL 159, PLPA 120/BIOL 120/  
      MCBL 120, PLPA 134/BIOL 134,  
      PLPA 134L/BIOL 134L  
   b) Evolution, Ecology, Behavior, Genetics  
      BIOL 105, BIOL 108, BIOL 118,  
      BIOL 157, BIOL 160, BPSC 144,  
      BPSC 146, BPSC 148, GEO 167,  
      GEO 168A, GEO 168B  
   c) Cell, Molecular, and Organismal Biology  
      BIOL 107A, BIOL 107B, BIOL 109,  
      BIOL 113, BIOL 114, BIOL 121A/  
      MCBL 121A, BIOL 121B/MCBL 121B,  
      BIOL 121L/MCBL 121L, BIOL 174,  
      BIOL 175, BIOL 175L, BIOL 176,  
      BIOL 176L, BIOL 178, CBNS 101
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. These concerns have led to a greater appreciation of the scientific approaches used to understand and address these problems. 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 are required to complete a series of courses designed to provide a broad, fundamental understanding of environmental toxicology. This curriculum design reflects the academic needs of the field, as well as a commitment to broad-based undergraduate training so that students will retain a number of academic and career options. 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

   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 117
   c) ENSC 101 or ENSC 136/ENTX 136/ CHEM 136, ENSC 102
   d) ENTX 101, ENTX 150/CBNS 150, 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 150A, CHEM 150B, ENSC 100, ENSC 100L/ENTX 100L, ENSC 135/ENTX 135, ENSC 140/SWSC 140, ENSC 141, ENSC 142, ENSC 142L, ENSC 144/ ENVE 144, ENSC 155, ENSC 163, ENSC 172, ENSC 174, ENSC 176/ SWSC 176, SWSC 176A/CBNS 176A, SWSC 107/ENTX 107, SWSC 111
   b) Health/Ecology

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 perhaps the most important central unifying concept linking all areas of the Biological Sciences. Ecology is the study of the inter-relationships and interactions between organisms and their environment.

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.

Besides a solid background in Evolution and Ecology, due to the flexible nature of the Biological Sciences degree, students can focus their training within the track such that they may 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 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 117, BIOL 160, ENTM 112/BPSC 112/ BIOL 112. 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)
      (1) Biological Diversity
         BIOL 151*, BIOL 157*, ENTM 100/ BIOL 100**, ENTM 114*, PLPA 134/L* BIOL 134, PLPA 134L/Biol 134L*
      (2) Functional Biology and Behavior
      (3) Ecology and Evolution

2. Statistics requirement (minimum of one course)

   STAT 100A, STAT 100B, STAT 120A, STAT 120B

3. Additional courses in biological sciences (upper division) and related areas from the approved list to bring total units to 52.

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. The importance of microorganisms in public health and in their application to beneficial uses has been recognized since the establishment of the discipline by its two co-founders Robert Koch and Louis Pasteur.

Students earning a B.S. degree in Biological Sciences under the Microbiology track will be trained for technical careers in a broad spectrum of the medicinal, agricultural, and environmental fields as consultants and technicians. Newly established industries in biotechnology will also be an outlet for their talents.

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

   a) BCH 110A, BCH 110B, BCH 110C or BIOL 107A
   b) BIOL 102 or BIOL 115, BIOL 121A/MCB 121A, BIOL 121B/MCB 121B, BIOL 157
   c) PLPA 123/BIO 123/MCB 123, PLPA 134/BIO 134

2. Additional upper-division requirements (at least three courses from the following)

   BIOL 107B, BIOL 109, BIOL 113, BIOL 114, BIOL 121B/MCB 121B, BIOL 128/CBNS 128, CBNS 101, ENSC 141, ENSC 155, MCB 122/BIOL 122, NEM 159/BIO 159, PLPA 120/ BIOL 120/MCB 120, PLPA 134/L/ BIOL 134L, SWSC 111

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 designed to provide students with a basic knowledge in the natural sciences with an emphasis in plant biology and 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.

With guidance from faculty, students choose a selection of classes within the track to prepare themselves for careers in teaching, research and other employment opportunities where training in basic sciences and/or plant biology is an asset. 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, forestry, 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 and STAT 120A are strongly recommended.

1. Upper-division core requirements
   a) BIOL 102
   b) BPSC 104/Biol 104
   c) Three courses from the following:
      BIOL 107A, BPSC 132/Biol 132,
      BPSC 135, BPSC 138/Biol 138,
      BPSC 143/Biol 143, BPSC 146
   d) Pest Management, Plant Pathology, and Nematology

2. Additional upper-division requirements (24 units must come from one of the following four areas of specialization)
   a) Plant Cellular, Molecular, and Developmental Biology (Genetics, Biotechnology)
      BCH 102, BCH 110A, BCH 110B, BCH 110C
      or BIOL 107A, BCH 162, BCH 183, BCH 184,
      BIOL 105, BIOL 107B, BIOL 108, BIOL 115,
      BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B,
      BIOL 121C/L/MCBL 121L, BIOL 128/ENTM 128,
      BPSC 135, BPSC 144, BPSC 150, BPSC 153/BCH 153
      or BIOL 109, BPSC 155/BIO 155, BPSC 157/BIO 157,
      BPSC 185/BCH 185, CBS 101, CHEM 109,
      ENSC 100, ENSC 100L, LEM 159/
      BIOL 159, PLPA 120/BIO 120/
      MCBL 120, PLPA 120L/BIO 120L/
      MCBL 120L, PLPA 123/BIO 123/
      MCBL 123, PLPA 154/BIO 154,
      PLPA 154L/BIO 154L, STAT 120A,
      BIOL 118, BPSC 146, BPSC 158,
      BPSC 165/ENTM 125, BPSC 166,
      BPSC 170/ANTH 170, ENTM 112/BIO 112/
      BPSC 112, ENSC 100, ENSC 100L, GEO 151,
      NEM 159/BIO 159, PLPA 120/BIO 120/
      MCBL 120, PLPA 120L/BIO 120L/
      MCBL 120L, PLPA 134/BIO 134,
      PLPA 134L/BIO 134L, STAT 120A,
      STAT 120B, SWSC 100L, SWSC 104/
      ENSC 104, SWSC 111, SWSC 124,
      SWSC 134/PLPA 134/ENSC 134
   d) Pest Management, Plant Pathology, and Nematology
      BCH 183, BIOL 121A/MCBL 121A,
      BIOL 121B/MCBL 121B, BIOL 121L/
      MCBL 121L, BPSC 146, BPSC 150,
      BPSC 158, BPSC 166, ENTM 109/
      BIO 109, ENTM 124, ENTM 127/BIO 127,
      ENTM 129, ENTM 129L, ENSC 100, ENSC 100L,
      NE 120, NE 159/BIO 159,
      PLPA 120/BIO 120/MCBL 120,
      PLPA 120L/BIO 120L/MCBL 120L,
      PLPA 123/BIO 123/MCBL 123,
      PLPA 134/BIO 134, PLPA 134L/
      BIO 134L, STAT 120A, STAT 120B,
      SWSC 100L, SWSC 104/ENSC 104,
      SWSC 111

3. Additional upper-division courses in biological sciences and related areas from any of the above lists, and students may apply a maximum of six units of BPSC 190 and/or BPSC 197 (alone or in combination) to bring total units to 52.
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, considerable latitude is allowed in selecting upper-division biology courses for the 36 units required for the major. Each student can meet with a faculty advisor (see Student Academic Advising below) to plan an academic program and select courses to prepare for postgraduate study or specific career objectives. Recommended programs of specialization are provided below as a guide in course selection.

Ordinarily, the 36 upper-division units required are selected from courses offered by the Department of Biology. A limited number of Biochemistry and Cell Biology and Neuroscience courses also satisfy upper-division unit requirements. The list of acceptable courses is available from the Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North). Qualified undergraduates (GPA 3.0 or above) may participate in graduate-level biology seminar courses by enrolling in BIOL 191. Consent of the instructor is required, and up to 4 units of BIOL 191 (with letter grade) may be included in the major.

Those who choose to obtain a B.S. degree have as a college breadth 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. These courses are selected with the assistance and approval of a faculty advisor. 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., CINS 120/PSYC 120, CHEM 005, STAT 100A, STAT 100B, MATH 009C).

**Degree 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 major in Biology may also fulfill the College’s breadth requirements. Consult with a department advisor for course planning.

1. Biology core curriculum (65–69 units)
   a) BIOL 005A, BIOL 051A, BIOL 005B, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C
   c) CHEM 112A, CHEM 112B, CHEM 112C
   d) MATH 009A, MATH 009B
   e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 021A, PHYS 021B, PHYS 021C
   f) One course from STAT 100A, STAT 105, or STAT 120A
   g) BCH 100 or BCH 110A
   h) Thirty-two (32) additional Biology units to be taken in consultation with a faculty advisor

2. Upper-division requirements (36 units)
   a) BIOL 102
   b) BIOL 102
   c) BIOL 102
   d) BIOL 102
   e) BIOL 102
   f) BIOL 102

3. 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.

**Programs of Specialization**

Suggested programs are described below for students preparing for careers in the medical professions (including dentistry and veterinary medicine), laboratory technology, the allied health professions, and teaching. Additional courses of study are provided for those interested in various biological fields (cell and molecular biology, molecular genetics, organismal genetics, zoology and physiology, and ecology and population biology). These programs meet most of the requirements for admission to corresponding professional schools and graduate programs.

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 other biological specializations such as microbiology, behavior, anatomy or developmental biology.

Students interested in any health related fields should seek information from the Health Professions Advising Office (visit 1114 Pierce Hall or cnas.ucr.edu/~health) and Career Services (Veitch Student Center) before developing a plan of study.

**Medical Professions**

BIOL 102, BIOL 161A, BIOL 161B, BIOL 167

Professional schools for medicine, veterinary medicine, osteopathic medicine, dentistry, podiatry, optometry and pharmacy commonly require for admission one or two years of college-level biology/zoolgy course work without specifying the exact courses. Some schools, however, do require certain courses, and often specific courses are highly recommended. Information about these requirements and required admission tests (MCAT, DAT, VCAT, OAT, PCAT), can be obtained from the Health Professions Advising Office (visit 1114 Pierce Hall or cnas.ucr.edu/~health) and Career Services (Veitch Student Center).

A national organization for each medical profession publishes admissions requirements for each school in that profession. The Medical School Admission Requirements publication is usually available in the UCR Bookstore. Publications that outline requirements for other professional schools may be ordered in the bookstore, and they are available in Career Services (Veitch Student Center).

The most commonly recommended courses for medical school are developmental biology, genetics, cell biology and vertebrate zoology. Most medical, dental and veterinary medical schools require that physics and other science courses be taken with a laboratory. Some dental schools require one or two courses in psychology (e.g., PSYC 001, PSYC 002) and principles of management (e.g., BSAD 010).

UC Davis School of Veterinary Medicine requires a course in statistics (e.g., STAT 100A), genetics (e.g., BIOL 102), and embryology (e.g., BIOL 167). Western University of Health Sciences requires courses in nutrition (e.g., BCH 010), genetics (e.g., BIOL 102), statistics (e.g., STAT 100A), computer skills (e.g., CS 008), technical writing (e.g., ENGL 015C), public speaking (e.g., THEA 050), and macroeconomics (e.g., ECON 002).

Some medical schools recommend that when science or mathematics courses are offered at two different levels, premedical students should take the more rigorous option. On the other hand, it is better to do well in the less rigorous option than to do poorly in the more difficult one. Some medical schools also recommend physical chemistry (e.g., CHEM 105), one year of college-level mathematics (e.g., MATH 005, MATH 009A, MATH 009B or the MATH 009A, MATH 009B, and MATH 009C sequence), biochemistry (e.g., BCH 100) and statistics (e.g., STAT 100A, STAT 100B).

Medical schools usually do not offer substantive instruction in parasitology, so students are advised to consider including BIOL 157 as part of the undergraduate program.

The Medical College Admissions Test (MCAT), Dental Admissions Test (DAT), and tests for other health professions are commonly taken in the spring of the junior year, so chemistry, physics, mathematics and some upper-division biology courses (genetics, anatomy, embryology, cell biology) should usually be completed during the first three years.
Laboratory Technology

Students who plan to apply to a laboratory technology school must obtain a Clinical Laboratory Technology Trainee license, which certifies that they have completed the required courses for admission to a training program. In addition to the lower- and upper-division courses required for the Biology major, the following courses are required by the California State Department of Health for a trainee license in Clinical Laboratory Science:

- BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 121C/MCBL 121C, BIOL 128/CBS 128, BCH 171, BCH 100 or BCH 110A, CHEM 005, and hematology. Students should inquire at the Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North) concerning hematology, since a separate course is not available at UCR. For admission to training laboratories approved by the American Medical Association, there is an additional requirement of one year of organic chemistry. Parasyitology (BIOL 157) and statistics are strongly recommended (e.g., STAT 100A, STAT 100B).

The Department of Biology recommends the following courses to strengthen preparation for a medical technology career: BIOL 107A and CBSN 101.

Career Services staff (Veitch Student Center) 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), the student should call (510) 873-6327, or write: State of California Department of Health, Laboratory Field Services, 2151 Berkeley Way, Annex 12 Berkeley, California 94704.

Allied Health Professions

BIOL 102, BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 161A, BIOL 161B, BCH 100

Students at UCR can take some of the course work preparatory for careers in nursing, physical therapy, dental hygiene, and physician’s assistant. In some programs such as physical therapy, nursing and dental hygiene, the student may complete two or three years here and then transfer to a professional school offering more specialized training and course work for the baccalaureate degree. In dental hygiene, the student may wish to obtain a bachelor’s degree here in Biology and then continue at a professional school for specialized training. For information about these alternatives and the specific requirements of various schools, students should seek information from the Health Professions Advising Office, (visit 1114 Pierce Hall or cnas.ucr.edu/~health) and Career Services (Veitch Student Center).

Physical therapy programs are currently in transition toward becoming graduate programs only. Practical work experience is required for admission to physical therapy and physician’s assistant programs (see Internships below). Most professional schools require that science courses be taken with lab where possible.

The lower-division requirements for the Biology major prepare students to take the specific upper-division courses required for admission to the professional schools in the allied health area. Not all the courses listed above are required by each type of professional school. A course in nutrition is usually required by nursing schools. This can probably be met by BCH 010 (Introduction to Nutrition). Students wishing to obtain their degree in biology at UCR before transferring should select additional upper-division course work in biology and related fields appropriate for the career objective.

Teaching Credential

Teachers in the public schools of California must be certified 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 section, Credential Programs). The latter usually requires three quarters and includes education courses and supervised teaching. 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 in which the candidate will teach. The candidate can demonstrate proficiency either by passing the commission’s subject-matter assessment examination, or, preferably, by completing an undergraduate program that is state approved for teacher preparation.

UCR has an approved undergraduate program for Biology majors who plan to get a Multiple Subjects Credential and teach in the elementary (K-6) grades (See Education section, Bridge to Teaching Program). 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.

UCR does not have a state-approved undergraduate program for Biology majors who wish to teach at the secondary level. The Teaching Credential in Science, biology emphasis, is required for biology 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 biology in depth and general science with introductory, college-level biology, chemistry, physics, and geoscience (geology, meteorology, oceanography, astronomy).

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 (CLAD, 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 (e.g., PED 021), and mainstreaming (EDUC 116/HMDV 116). Further information is provided in orientation meetings, at the Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North) and the Graduate School of Education (1124 Sproul Hall).

Cell and Molecular Biology

BIOL 102, BIOL 105, BIOL 107A, BIOL 107B, BIOL 109, CBSN 101 or BIOL 113 and BIOL 114, BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 128/CBSN 128, BIOL 155/BPSC 155, BCH 100 or the BCH 110A, BCH 110B, and BCH 110C sequence, BCH 102, CBSN 150/ENTX 150, CHEM 005, CHEM 101, STAT 100A and STAT 100B or STAT 120A and STAT 120B

Molecular Genetics

BIOL 102, BIOL 107A, BIOL 107B, BIOL 109, BIOL 115, BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 128/CBSN 128, BIOL 155/BPSC 155, BCH 185/BPSC 185, CBSN 150/ENTX 150, CBSN 169

Organismal Genetics

BIOL 102, BIOL 105, BIOL 107A, BIOL 107B, BIOL 109, BIOL 115, BIOL 155/BPSC 155, BCH 185/BPSC 185, CBSN 150/ENTX 150, CBSN 169

Zoology and Physiology

BIOL 102, BIOL 105, CBSN 101 or BIOL 113 and BIOL 114, BIOL 151, BIOL 160, BIOL 160L, BIOL 161A, BIOL 161B, BIOL 167, BIOL 175, BIOL 176, BCH 100. Students are also encouraged to take laboratory courses (e.g., BCH 102, BIOL 175L, BIOL 176L). Also recommended: BIOL 157, a course in ecology (e.g., BIOL 117 or BIOL 127/ENTX 127), BIOL 100/ENTX 100, BIOL 175/ENTX 175, STAT 100A and STAT 100B

Ecology and Population Biology

BIOL 102, BIOL 104/BPSC 104, BIOL 105, BIOL 108, BIOL 117, BIOL 118, BIOL 160, BIOL 160L, either BIOL 175 and BIOL 175L or BIOL 143/BPSC 143, the MATH 009A, MATH 009B, and MATH 009C sequence, either STAT 120A and STAT 120B or STAT 100A and STAT 100B.

Also recommended: BIOL 151, BIOL 161A, BIOL 165, BPSC 146, MATH 046

Preparation for Graduate School

The specializations presented above are appropriate as preparation for those planning to attend graduate school for advanced degrees. The faculty advisor assists in selecting combinations of courses appropriate for advanced study in the fields listed above and others. Students considering graduate study are encouraged to gain competence in at least one foreign language. Undergraduate research and courses in computer science and statistics should also be considered.
The various campuses and departments of the University of California 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 most programs. Letters of recommendation, undergraduate research and results on the GRE are also considered. A minimum GPA of 2.50 in the last 60 units of undergraduate coursework 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.

**Transfer Students**

Transfer students majoring in Biology need to complete at least three of the following full-year sequences, which must include general chemistry:

1. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C
2. First-year calculus, equivalent to MATH 009A, MATH 009B
3. General biology, equivalent to BIOL 005A, BIOL 051A, and BIOL 005B (and BIOL 005C, if available)
4. General physics with laboratory 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. If time permits, students are strongly encouraged to complete one year of organic chemistry with laboratory (for which a one-year chemistry series is a prerequisite). Partial satisfaction of the breadth requirements (e.g., humanities and social sciences) also accelerates the student's progress.

To integrate transfer credits with a program of study at UCR, it is important that all new transfer students consult with a faculty advisor before or early in their first quarter on campus (see Student Academic Advising below). Prospective UCR students are welcome to discuss their past and future academic program with a faculty advisor. Call the Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North) at (909) 787-3579 to arrange an appointment.

**Grading Basis**

Students are required to enroll for letter grade credit in science and mathematics courses used to satisfy major requirements. Science and mathematics courses counted as electives may be taken on a Satisfactory (S)/No Credit (NC) basis. Non-science courses such as those in humanities and social sciences may also be taken as "SNC". English and foreign language courses may be taken as "SNC", but this is not recommended. English composition is so basic and important that students should aim for excellence rather than a satisfactory level of achievement. 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.

**Student Academic Advising**

Academic advising is available through the Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North), Monday through Friday, 9 a.m. to noon and 1 to 4 p.m., (909) 787-3579.

Policies and other related business requiring an advisor's signature or approval should be routed through the Biological Sciences Undergraduate Advising Center. The Department of Biology requires that each new freshman and transfer student consult with a faculty advisor before or during the first quarter at UCR. After that initial conference to review transfer credits and plan a program of study, the student may visit the advising center to speak with an advisor as needed.

The department recommends that each student meet with a faculty advisor at least once each year to review progress, clarify career objectives and revise the program of study so it is commensurate with the developing interests and objectives of the student.

**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 Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North).

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 Biological Sciences Undergraduate Advising Center by the last day of instruction of the quarter.

BIOL 194, BIOL 197, and BIOL 199 are graded “SNC”, 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.

**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. Those majoring in Biology 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 a tutor or teacher’s assistant in local high schools.

Students majoring in Biology are welcome to participate in the internship program, but they are not paid for this work, and the Department of Biology does not give academic credit for internships. 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.
Natural Reserve System
This system was formed by the University of California 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 twenty-seven reserves, eight of them administered by the UCR Committee of the Natural Reserve System. The reserves administered by the Riverside campus are described in the Special Study Resources and Facilities section of 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. At 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 Spieih Hall, (909) 787-3953, to obtain an application, map and list of rules and regulations.

White Mountain Research Station (WMRS) Supercourse: Environmental Biology
The White Mountain Research Station (WMRS) Supercourse exposes students to and trains them in diverse approaches to solving problems about plant and animal interactions with each other and with their environments, both pristine and human perturbed. In this course, the Owens Valley of eastern California serves as a microcosm of natural resource exploitation, symbolic of many global systems, where a major resource (water, in this instance) is collected and exported, potentially to the detriment of the source ecosystems. Students are in residence at the WMRS in Bishop, California, for the entire spring quarter. Research studies include both traditional natural history-based field methods, and modern laboratory-based techniques. Students enroll in three concurrent courses, worth 4 units each — BIOL 164A (Applied Conservation Biology), BIOL 164B (Field Ecology), and BIOL 164C (Physiological Ecology). In addition, students enroll in BIOL 164D (4 units; Independent Research in Environmental Biology) and give a poster presentation at the annual Physiological Ecology meeting held at WMRs. Contact the Biological Sciences Undergraduate Advising Center at (909) 787-3579 for more information.

GRADUATE PROGRAM
The Department of Biology offers programs leading to the M.S. and Ph.D. degrees in Biology with specializations in Cell and Molecular Biology, Evolutionary Biology, and Physiology. The university requires that domestic applicants to graduate study supply GRE scores for the General Tests (verbal, quantitative and analytical) before they can be admitted. The department also requires submission of the Subject Test score.

All graduate students entering the department meet with a guidance committee during the first quarter of enrollment so that their educational background can be assessed. Considering 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 specialization.

Master’s Degree
To qualify for the M.S. degree in Biology, candidates must meet the minimal requirements of the Thesis Plan and the requirements of the Department of Biology. These requirements are as follows:

Thirty-six (36) quarter units of approved courses in the 100 or 200 series, of which at least 24 units must be in 200 series courses in the biological sciences (students in the Cell and Molecular track must take BIOL 200/CMB 200 and BIOL 201/CMB 201). Not more than 12 units of BIOL 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. Preparation and presentation of an acceptable thesis and a final oral examination in defense of the thesis are required of every candidate for the degree.

Doctoral Degree
In addition to the general requirements of the Graduate Division, students intending to become candidates for the Ph.D. degree in Biology must pass a written examination in their special field of interest not later than the end of the second year of residence. Course requirements are determined by the guidance committee in consultation with the student. Candidates for the Ph.D. are required to have at least one year of approved teaching experience. Normative Time to Degree 18 quarters Opportunities for Graduate Study in Neuroscience
Faculty from the Department of Biology also participate in the graduate program 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 Curricula and Courses section of this catalog.

LOWER-DIVISION COURSES
BIOL 002. Cellular Basis of Life. (4) Lecture, three hours; laboratory, three 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 recommend-ed for natural science majors. Credit is not awarded for BIOL 002 if it has already been awarded for BIOL 005A or BIOL 005A. 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.

BIOL 003. Organisms in Their Environment. (4) Lecture, three hours; laboratory, three 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. Credit is not allowed for both BIOL 003 and BIOL 005B. 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.

BIOL 005A. Introduction to Cell and Molecular Biology. (3) Lecture, three hours. Prerequisite(s): BIOL 05LA (may be taken concurrently); CHEM 001A or CHEM 01HA; 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, three 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, three hours; laboratory, three hours. Prerequisite(s): BIOL 005A and BIOL 005A 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 005 or BIOL 005B.

BIOL 005C. Introductory Evolution and Ecology. (4) Lecture, three hours; laboratory, three 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 009A or equivalent (may be taken concurrently); consent of instructor is required for students repeating the course. An intensive course designed to introduce the student to the subjects of evolution and ecology. Covers population dynamics, community ecology, population genetics, and evolutionary theory. (Required for Biology majors; recommended for science majors desiring an introduction to biology.) Students who take BIOL 002 and BIOL 003 as part of another major, or those 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, three hours; laboratory, three hours. Prerequisite(s): none. Evolution of life beginning with precellular life. Topics include the origin of sex; multicellularity; vertebrate classes; morphological specializations;
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adaptive radiations; extinction dynamics; and the biology
of dinosaurs. Cross-listed with GEO 003.

ing contemporary recombinant DNA technology and applications of molecular cloning procedures.

the cell. Students read original journal articles, an analysis
of which is the focus of the discussion section.

BIOL 030. Human Reproduction and Sexual
Behavior. (4) Lecture, three hours; discussion, one
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 107B.Advanced Molecular Biology. (3)
Lecture, two hours; discussion, one 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 115. Human Genetics. (3) Lecture, three
hours. Prerequisite(s): BCH 110A; BCH 110B; BCH 110C
or BIOL 107A (may be taken concurrently); STATE 105 or
equivalent; BIOL BIOL 121A/MCBL 121A; or third-year
standing in the Biomedical Sciences Program; 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
genemapping, inborn errors in metabolism, human population genetics, polymorphic cell surface antigens, multifactorial inheritance genetics of cancer, prenatal diagnosis,
uses of recombinant DNA in medical genetics.

BIOL 034. Human Heredity and Evolution. (4)
Lecture, three hours; discussion and problem solving, one
hour; audio-visual aids plus discussion, one 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, three hours;
discussion, one hour. Prerequisite(s): none. This lecture
course for nonscience 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, three
hours; laboratory, three 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,
three hours; discussion, one 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, three hours; laboratory, three hours.
Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C,
CHEM 112A, CHEM 112B. 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, three hours; discussion, one 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; or
consent of instructor. 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; natural selection, drift, and other forces of evolution.
BIOL 107A. Molecular Biology. (4) Lecture, three
hours; discussion, one 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, includ-

BIOL 108. Introductory Population Genetics. (4)
Lecture, three hours; discussion and demonstration, one
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
neutralist versus selectionist debate, molecular evolution,
ecological genetics, and quantitative genetics.
BIOL 109. Laboratory in Cell and Molecular
Biology. (5) Lecture, one hour; discussion, one hour;
laboratory, nine hours. Prerequisite(s): BCH 110C or
BIOL 107A; CBNS 101; consent of instructor. An experimental, integrative approach to contemporary cell and
molecular biology techniques. Experiments include
immunolocalization, isolation of cellular proteins and
nucleic acids, electrophoretic analysis and immunoblotting, enzymatic manipulation of DNA in vitro, molecular
cloning, and gene expression. Credit is awarded for only
one of BCH 153/BIOL 153/BPSC 153 or BIOL 109.
BIOL 110. Biology of Human Problems. (4)
Seminar, four 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 112. Systematics. (4) Lecture, three hours; discussion, one 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,
three hours; discussion, one 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) (4) Lecture, three
hours; discussion, one 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

BIOL 117. Introductory Population and Community Ecology. (4) Lecture, three hours; discussion,
one 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
factors governing the distribution and abundance of
organisms. Topics include population dynamics, population interactions, the nature and organization of communities, and the role of biotic interactions in evolutionary
change. Credit is awarded for only one of BIOL 117 or
BIOL 127/ENTM 127.
BIOL 118. Field Course in Evolutionary Ecology. (4) Lecture, one hour; discussion, one hour; field,
eight hours. Prerequisite(s): BIOL 005A, BIOL 005B,
BIOL 005C, BIOL 117 or equivalent, 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; consent of instructor; BIOL 163 recommended.
A series of field exercises related to topics of current
interest in evolutionary ecology. Topics include the effects
of competition, predation, and mutualism on populations
and communities; and theories of optimal behavior, morphology, and life history. Emphasis placed on the design,
execution, and analysis of field experiments. Credit is
awarded for only one of BIOL 118 or BIOL 164B.
BIOL 119. Functional and Evolutionary Bioinformatics. (4) Lecture, three hours; laboratory, three
hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL
005C, BIOL 107A, 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 theory and practice of bioinformatics,
emphasizing database techniques, the interpretation and
analysis of protein and DNA sequence data, and molecular
evolutionary analyses.
BIOL 120. Introduction to Plant Pathology. (3)
Lecture, three 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, four hours. Prerequisite(s): BIOL
005A, BIOL 005B; concurrent enrollment in BIOL 120/
MCBL 120/PLPA 120 or consent of instructor; BIOL 121A/
MCBL 121A and BIOL 121B/MCBL 121B recommended.
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 121A. Microbiology. (4) Lecture, three hours;
discussion, one hour. Prerequisite(s): BIOL 005A, BIOL
05LA, BIOL 005B, BIOL 005C, CHEM 001C or CHEM
01HC, CHEM 112C, MATH 009B or MATH 09HB, PHYS


BIOL 121B. Microbiology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 121A/MCB 121A with a grade of "C-" or better or consent of instructor. An introduction to the fundamental physiology, genetics, 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 MCB 121B.

BIOL 121L. Microbiology Laboratory, (3) Lecture, one hour; laboratory, six hours. Prerequisite(s): BIOL 121A/MCB 121A with a grade of "C-" or better or consent of instructor. 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 MCB 121L.

BIOL 122. Food Microbiology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 121A/MCB 121A with a grade of "C-" or better 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 134. Introduction to Mycology Laboratory. (1) Laboratory, three 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; or consent of instructor. Introduction to the morphology, taxonomy, genetics, physiology, ecology, and economic importance of the major groups of fungi. Cross-listed with PEPA 135.

BIOL 138. Morphology of Vascular Plants. (4) Lecture, two hours; laboratory, six 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); or consent of instructor. Investigates the comparative morphology and evolution of vascular plants from the viewpoint of fossil and living representatives, with a focus on the Angiosperms. Cross-listed with BSC 138.

BIOL 143. Plant Physiology. (4) Lecture, three hours; laboratory, three 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/BSC 104; or consent of instructor. An intensive introduction to the fundamental principles of plant physiology, including photosynthesis, respiration, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BSC 143.

BIOL 151. Invertebrate Zoology. (5) Lecture, three hours; discussion, one hour; laboratory, three 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); 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 BSC 151.

BIOL 153. Plant Genomics and Biotechnology Laboratory. (4) F, Odd Years Lecture, one hour; discussion, one hour; laboratory, six hours. Prerequisite(s): BCH 116G or BIOL 107G, upper-division standing, consent of instructor. A study of modern techniques in plant genome modification. Topics include nuclear 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 BSC 153. Credit is awarded for only one of BCH 153/BIOL 153/BSC 153 or BIOL 109.

BIOL 155. Chromosomes. (4) Lecture, three hours; discussion, one 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 chromosomal structure, and behavior of eukaryotic chromosomes. Cross-listed with BSC 155.

BIOL 157. Parasitology. (5) Lecture, three hours; discussion, one hour; laboratory, three 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 systemsatics, morphology, and identification, and includes field trips to local habitats.

**BIOL 164A. Applied Conservation Biology.** (4) Lecture and discussion, twenty-five hours per quarter; field and laboratory work, forty-five hours per quarter. Prerequisite(s): BIOL 050A, BIOL 050B, BIOL 050C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 099B or MATH 099H, PHYS 002C, PHYS 021C, one course in statistics; concurrent enrollment in BIOL 164A, BIOL 164C, BIOL 164D; consent of instructor. An examination of natural resource conservation with emphasis on habitat and ecosystem management, endangered species, biodiversity maintenance, and the trade-offs between resource exploitation, preservation, and sustainability. The Owens Valley of eastern California serves as a case study. Satisfactory (S) or No Credit (NC) grading is not available.

**BIOL 164B. Field Ecology.** (4) Lecture, twenty hours per quarter; discussion, ten hours per quarter; field and laboratory work, thirty hours per quarter. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 099B or MATH 099H, PHYS 002C, PHYS 021C, one course in statistics; concurrent enrollment in BIOL 164A, BIOL 164C, BIOL 164D; consent of instructor. An examination of factors governing the distribution and abundance of organisms. Emphasizes studies of community structures and their relationships to distribution and abundance of organisms. Emphasizes topics in current developmental research, with an emphasis on the molecular mechanisms of pattern formation and differentiation.

**BIOL 171. Human Anatomy and Physiology.** (5) Lecture, three hours; laboratory, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 112C, MATH 099B or MATH 099H, PHYS 002C, PHYS 021C, one course in statistics; concurrent enrollment in BIOL 164A, BIOL 164B, BIOL 164C, BIOL 164D; consent of instructor. Special study and research in environmental biology. 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 178. Hormones and Behavior.** (3) Lecture, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 099B or MATH 099H, PHYS 002C, PHYS 021C, BCH 100 or BCH 110A, one course in statistics. A survey of the morphological and physiological functions and opportunities for research in endothermy, artificial selection experiments, and phylogenetic research. Topics include sexual differentiation, sex differences in behavior, sexual behavior, parental behavior, song, movement, olfaction, and phylogeny. Satisfactory (S) or No Credit (NC) grading is not available.
BIOL 200. Cell Biology. (4) Lecture, three hours; seminar, one hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 113 or BIOL 114 or GENS 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, three hours; seminar, one hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently). BIOL 102 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 pre-rRNA stability, processing, editing and translation, methods for gene mapping, and positional cloning. Cross-listed with CMDB 201.

BIOL 203. Cellular Biophysics. (3) Lecture, three hours. Prerequisite(s): BIOL 200/CMDB 200; BIOL 201/CMDB 201; CHEM 109 or equivalent; or consent of instructor. Examines the fundamental biophysical 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 ENT 208.

BIOL 210. Developmental Biology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 100/ENTM 100 or BIOL 157 or consent of instructor. Explores the fundamental biophysical 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 CMDB 201.

BIOL 212. Ecological Systems in Space and Time. (4) Lecture, two hours, discussion, one hour. Prerequisite(s): BIOL 160 or consent of instructor. Examines animal behavior in an evolutionary context. Tracks the historical development of the study of behavior, drawing from ethology, comparative psychology, and sociobiology. Topics include evolution of socially, sexual selection, predator-prey behavior, and parental care.

BIOL 214. Population Genetics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 200 or consent of instructor. Traces the historical development of modern ideas in Population 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.

BIOL 216. The Theory of Evolution. (4) Lecture, three hours; discussion, one hour. 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.
BIOL 290. Directed Studies. (1-6) Variable hours. Prerequisite(s): graduate standing and consent of instructor. Individual studies on specially selected topics in biology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BIOL 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. degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BIOL 292. Concurrent Analytical Studies in Biology. (2-4) Research, six to twelve hours. Prerequisite(s): consent of instructor. The course will be elected concurrently with an appropriate undergraduate course, but on an individual basis. It will be devoted to one or more graduate papers based on research or criticism related to the course. Faculty guidance and evaluation will be provided throughout the quarter. May be repeated for credit.

BIOL 297. Directed Research. (1-6) Variable hours. Prerequisite(s): graduate standing and consent of instructor. Directed research in biology. Experimental studies on specially selected topics in biology under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BIOL 299. Research for Thesis or Dissertation. (1-12) Variable hours. Prerequisite(s): graduate standing and consent of instructor. Original research in an area selected for the advanced degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BIOL 301. Teaching of Biology at the College Level. (1) Seminar, one 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).

PROFESSIONAL COURSE

BIOL Biochemical Sciences / 139

Professor Emerita
Mary Ann Baker, Ph.D. Neurosciences

Associate Professors
John Y.-J. Shyu, Ph.D. Pharmacology/Physiology
Christian T. Ytle, Ph.D. Physiology

Assistant Professors
Kathryn DeFea, Ph.D. Physiology
Douglas Ehrell, Ph.D. Neurobiology
Iryna Ehrell, Ph.D. Biology/Biochemistry

Adjunct Professors (City of Hope)
John Rossi, Ph.D. Microbiogenetics
John Shively, Ph.D. Biochemistry
John Zaia, M.D.

Lecturer
James Golgan, Ph.D.

Clinical Professors
Neal S. Bricker, M.D.
Lawrence A. Cone, M.D.
Leon H. Ewin, M.D.
Asma B. Jafari, M.D.
Irvin N. Kuhn, M.D.
Steven E. Larson, M.D., M.P.H.
Lawrence K. Loo, M.D.
Stewart W. Shankel, M.D.
Constance M. Vadem, Ph.D.

Associate Clinical Professors
E. M. Abdulmumin, Ph.D.
Y. Paul Aoyagi, M.D.
Roscoe D. Atkinson, M.D.
Ann E. Bolger, M.D.
William P. Hunt, M.D.
Kenneth G. Jordan, M.D.
William E. Junkert, Jr., M.D.
Rajagopal Krishnan, M.D.
Walker M. Marcus, M.D.
Elizabeth M. Richards, M.D.
Barbara A. Silver, M.D.
C. Paul Sinkhorn, M.D.
Catherine M. Steel, Ph.D.
Paula W. Stoessel, Ph.D.

Assistant Clinical Professors
Adolfo Aguilera, M.D.
Dan L. Andrus, M.D.
Joseph A. Bailey, II, M.D.
Patricia Blakely, M.D.
Suvesh Chandok, M.D.
Walker E. Combs, M.D.
Alan C. Compton, M.D.
Andrew P. Corr, M.D.
Vinod K. Dasika, M.D.
Samuel E. Dey, Jr., M.D.
James T. Evans, M.D.
Frank M. Flowers, M.D.
Donald G. Gates, D.O.
Jonathan R. Greer, M.D., M.P.H.
T. Thomas Haider, M.D.
Laura A. Hammond, Ph.D.
Fred Z. Havens, M.D.
Hal X. Ho, M.D.
Lalima Anwar Hog, M.D.
Jonathan W. Horstmann, M.D.
Galyn C. L. Huang, M.D.
Andrew M. Hubbard, M.D.
Dean N. Huyhn, M.D.
James S. Ilwng, D.O.
Ramesh Karody, M.D.
Daniel Kinn, M.D.
David A. Laman, M.D.
Sharon M. Langhlin, M.D.

Kerry C. Litman, M.D.
Javier I. Machucha, M.D.
Mary M. Marcinko, M.D.
Pranay R. Mehta, M.D.
D. Steven Meyer, M.D.
Kevin J. Mielke, D.O.
Mina N. Mikhail, M.D.
Vinod Mishra, M.D.
Renu Mittal, M.D.
Janis E. Neuman, M.D.
Virgil J. Nielsen, M.D.
Kirk D. Pagel, M.D.
Charles Pai, D.O.
Lien Tran Pham, M.D.
Mevin A. Quan, M.D.
Baldev S. Rai, M.D.
Garry D. Roghair, M.D.
Carollann Rosario, M.D.
Michael T. Saito, M.D.
Robert E. Sallis, M.D.
Graham A. Scott, M.D.
Jeffrey R. Simons, M.D.
Robert B. Summerour, M.D.
Ravi Thiruvengadam, M.D.
Susan R. Van Holten, M.D.
Dorothy E. Vura-Weis, M.D.
Steven Wilson, M.D.
Samuel G. Wiltchik, M.D.
Joanne Wilkowski, M.D.

Steering Committee
Stewart W. Shankel, M.D.
Thomas A. Drake, M.D. (Pathology, UCLA)
Richard A. Ruben, Ph.D.
Richard W. Olsen, Ph.D. (Pharmacology, UCLA)
Michael B. Stemerman, M.D.
Daniel S. Straus, Ph.D.
John McD. Tormey, M.D. (Physiology, UCLA)

UCR/UCLA THOMAS HAIDER PROGRAM IN BIOMEDICAL SCIENCES

The Biomedical Sciences Program is an innovative approach to medical education developed by the University of California, Riverside, the UCLA School of Medicine and the clinically affiliated medical centers in the surrounding communities of Riverside and San Bernardino. It offers highly qualified students the opportunity to earn the M.D. degree in seven years instead of eight. It emphasizes the education of physicians who deal with the entire spectrum of disease diagnosis and treatment. Moreover, it provides a social and cultural background for its participants by including electives in the humanities and in the social and behavioral sciences as part of the curriculum.

Changes to the Biomedical Sciences Program application procedure are being considered for Fall 2003 admission. Check biomedupdate.ucr.edu or contact the program office for current information.

The Biomedical Sciences Program admits freshmen qualified for entrance into the University of California. Admission is granted to high school graduates entering UCR in the fall quarter. In addition, high school applicants to the UCR/UCLA Thomas Haider Program in Biomedical Sciences must have demonstrated a high level of scholarship in...
high school so as to provide a strong foundation for undertaking the rigorous, accelerated, first-year curriculum. Admission is also subject to the following criteria:

1. At least three high school laboratory courses (e.g., biology, chemistry, physics)
2. Mathematics competency so as to qualify for college-level calculus
3. English composition proficiency so as to qualify for placement either in ENGL 001A or BSWT 001 at the time of enrollment at UCR

Test scores from the SAT or American College Test (ACT) and three required College Board Achievement Tests are also used to determine eligibility for admission. Continuation in the program for each succeeding year is decided primarily by a review of academic performance.

UCR students may also transfer into the Biomedical Sciences Program up until the end of their sophomore year if they have

1. Taken all the required courses (see Required Program)
2. Carried an average academic load of approximately 18 quarter units per year
3. Obtained approval from the Premedical Advancement Committee of the Division of Biomedical Sciences.

UCR students interested in transferring into the Biomedical Sciences major are encouraged to contact the Divisional Program Advisor.

**During the first three years,** students complete a core of premedical courses in the biological and physical sciences and introductory courses in biomedical ethics and medical care, as well as electives in the social sciences and humanities.

**At the conclusion of the third undergraduate year,** students are selected for continuation in the medical school phase of the program. The admissions process involves consideration of the student’s record of scholarship, demonstrated aptitude for a commitment to medicine, activities outside of the academic setting, interaction with and compassion for others, leadership qualifications, and general personality traits that best characterize the physician. The admissions committee evaluates academic transcripts, MCAT scores, letters of recommendation, a statement from the student and reports from special faculty interviewers. The total information is reviewed and advancement to the medical phase for each student is determined by vote of all members of the admissions committee.

**Beginning with the fourth year,** those students advanced to the medical school phase of the program are enrolled concurrently at UCR and the UCLA School of Medicine while still in residence at UCR. Students take course work in human anatomy, pathology, physiology, Doctoring I, medical microbiology, and neuroscience. Students continue their fifth year program of clinical studies, pharmacology, and patient relations at UCR. After their fifth year they transfer to the UCLA School of Medicine and complete the last two years of M.D. requirements. They also receive the B.S. degree from UCR after the fourth year in the program.

Those students who do not continue in the accelerated program have additional opportunities to pursue careers in the health sciences. For example, after earning a B.S. degree they would be well qualified for application for admission to any four-year medical school, including the UCLA School of Medicine. The Biomedical Sciences Program also qualifies students for alternate possibilities such as pursuing graduate study for an M.S. or Ph.D. degree in any of the health-related sciences.

**Degree 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 in the B.S. program must satisfy. See the Biomedical Sciences Program office for courses that fulfill the Humanities and Social Sciences breadth requirement.

**Program Requirements**

The required program in Biomedical Sciences shown below meets both college breadth and major requirements.

Special requirements of the program are as follows:

1. The Humanities and Social Sciences portions of the college breadth requirements must be met within the student’s first three years at UCR. To aid in completion of this requirement, the required program contains the following courses that may also be used toward the college breadth requirement. PSYC 001, PSYC 002, PHIL 167, and the course used to fulfill the Behavioral Science requirement (see 3. below).

2. Students must complete two upper-division courses (4 units each) in the Humanities or Social Sciences in addition to those used to satisfy the college requirements. These courses may not be taken S/NC. The course used to fulfill the Behavioral Sciences requirement (see 3. below) and PHIL 167 may not be used to meet this requirement.

3. Students must complete a one-quarter elective course in Behavioral Sciences dealing with the adjustment of the individual to society and/or relationships of science and medicine to society. This requirement can be met by taking one of the following 4-unit courses: ANTH 106, ANTH 133, ANTH 162; ETST 164, ETST 167/PSYC 167, ETST 168/PSYC 168, HMDV 116/EDUC 116, HMDV 117/EDUC 117, HMDV 174/SOC 174, PSYC 140, PSYC 150, PSYC 152, PSYC 153, PSYC 155, PSYC 160A/HMDV 160A, PSYC 160B/HMDV 160B, PSYC 178, SOC 173. This course may not be taken S/NC but may satisfy a portion of the college breadth requirements in Humanities and Social Sciences.

4. With respect to elective courses, Biomedical Sciences majors should not duplicate any subject material, which is covered in the medical phase (years 4–7) of the program (e.g., human physiology, immunology, genetics, physiological psychology).

5. Students must maintain at least a 3.00 cumulative grade point average for their freshman year to qualify for advancement into the second year of the program. A minimum grade point average of 3.3 is required to advance into the third year of the program.

6. By the end of year 3 of the program, Biomedical Sciences majors should have accumulated a minimum total of 140 academic units. Students must have completed 44 units toward their graduation requirements prior to the fall quarter of their sophomore year. The following courses or their equivalents should not be taken during the summer sessions: CHEM 001A, CHEM 001B, CHEM 001C, MATH 009A, MATH 009B, BIOL 005A, BIOL 005B, BIOL 005B, ENGL 001A, ENGL 001B. For the sophomore and junior years, students must maintain an average of 16 units per quarter; units taken prior to enrolling at UCR or during summer sessions cannot be included in this total.

7. Courses listed in the required program below are to be taken according to the indicated yearly schedule.

Students not selected for continuation in the medical school phase of the accelerated program change to another major in the College of Natural and Agricultural Sciences and complete the course requirements for that major in the fourth year. Students in the Biomedical Sciences Program are urged to consult periodically with a faculty advisor.

**Required Program**

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<tr>
<th>Course</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tr>
<td>CHEM 001A, CHEM 001B,</td>
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<td>BIOL 005B</td>
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<tr>
<td>English requirement and/or</td>
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<tr>
<td>Humanities/Social Sciences</td>
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Total Units: 12-16* 12-16* 12-16* 12-16*

*Students must have completed 44 units toward their graduation requirements prior to the fall quarter of their sophomore year.
Biomedical Sciences / 141

Junior

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<th>Course Code</th>
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<td>BMSC 115</td>
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<td>BMSC 121A/MCBCL 121A</td>
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Second Year

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Total Units for Junior Year: 15 17 17

Sophomore

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<td>PHYS 002A, PHYS 002B, PHYS 002C</td>
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<td>Humanities/Social Sciences, (PSYC 001, PSYC 002)</td>
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<td>Total Units</td>
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Additional information may be requested by writing to the program counselor or by calling (909) 787-4353.

LOWER-DIVISION COURSE

BMSC 097. Research Tutorial in Biomedical Sciences. (1-2) Laboratory, three to six 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


BIOL 115. Human Genetics. (3) S Description under Biology.

BIOL 121A/MCBCL 121A. General Bacteriology and Microbiology. (4) F Description under Biology.


CHEM 112A, CHEM 112B, CHEM 112C. Organic Chemistry. (4, 4, 4) Description under Chemistry.

PHIL 167. Biomedical Ethics. (4) W Description under Philosophy.

STAT 105. Statistics for Biomedical Sciences. (2) F Description under Statistics.

BMSC 100. Introduction to Medical Care. (2) Lecture, one hour; discussion, one hour. Prerequisite(s): third-year standing in the Biomedical Sciences Program. Consideration of the modern health care system. The course will include patient demonstrations and visits to primary care clinics, to operating and emergency rooms, to mental health facilities, and to private physicians’ offices. These will be in small group sessions conducted in local hospital facilities. Graded Satisfactory (S) or No Credit (NC). Johnson

BMSC 103. Behavioral Sciences. (4) Lecture, four hours. Prerequisite(s): BIOL 005A, BIOL 005B, STAT 105; or consent of instructor. Introduction to models of human behavior and the mind, and the application of the scientific method to the study of behavior. Topics covered include cognition, development personality, clinical psychology, social psychology, and research methods including research design and statistical analysis.

BMSC 120. General Biochemistry Related to Biomedical Sciences. (4) Lecture, three hours; discussion, one 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. Although the course is designed specifically for the curriculum of the Biomedical Sciences Program, it may be appropriate for students in other departments. Cross-listed with BCH 120. Henry, Luben, Norman

BMSC 194. Independent Reading. (1-2) Discussion, one hour; research, two to three 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, three to nine 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 200A. Human Gross Anatomy. (5) Lecture, two hours; laboratory, nine hours. Prerequisite(s): fourth-year standing in the Biomedical Sciences Program, or M./Ph.D. status in the Biomedical Sciences Graduate Program, or consent of instructor. A detailed study of the human organ system function. Consists of lectures, discussions, and laboratory exercises dealing with the physiology of the cardiovascular, respiratory, renal, and gastrointestinal systems and with the relationship of normal physiology to disease states. laboratories include case discussions and problem-solving exercises that emphasize clinical connections. Graded In Progress (IP) until BMSC 210A and BMSC 210B are completed, at which time a final, letter grade is assigned. Lytle

BMSC 210B. Human Physiology. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): BMSC 210A; fourth-year standing in the Biomedical Sciences Program, or M./Ph.D. status in the Biomedical Sciences Graduate Program, or consent of instructor. A detailed study of human organ system function. Consists of lectures, discussions, and laboratory exercises dealing with the physiology of the cardiovascular, respiratory, renal, and gastrointestinal systems and with the relationship of normal physiology to disease states. Laboratories include case discussions and problem-solving exercises that emphasize clinical connections. Quinton

BMSC 220. Neurosciences. (5) Lecture, three hours; laboratory, six hours. Prerequisite(s): fourth-year standing in the Biomedical Sciences Program, or M./Ph.D. status in the Biomedical Sciences Graduate Program, or consent of instructor. Structure and function of the nervous system. This course emphasizes the interrelationships between anatomy, physiology, and biochemistry of the nervous system as a basis for understanding its function in health and disease. Colgan, I. Ethell, D. Ethell

BMSC 222. Special Topics in Biomedical Sciences. (2) Lecture, one hour; discussion, one hour. Prerequisite(s): graduate standing or consent of instructor. For BMSC 222A: BMSC 224 or BIOL 120/NRSC 128 or 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 emphasizes recent advances in the specialized topic area and varies accordingly. Course is repeatable.

E. Basic Epitheliology. Lytle, Quinton
G. Regulation of Gene Expression. Strauss
I. Hematopoiesis
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
R. Cerebral Control of Visceral Functions
Curricula and Courses

**BMSC 224. Medical Immunology.** (4) Lecture, three hours; laboratory, four hours. Prerequisite(s): BMSC 224 or equivalent; fourth-year standing in the Biomedical Sciences Program, or M.S./Ph.D. status in the Biomedical Sciences Graduate Program, or consent of instructor. Introduction to the molecular and cellular basis of the human immune system including discussion of antibody structure/function and cell-mediated inflammatory processes. Integration will include consideration of concepts related to the immune system in host defense and various pathological disease conditions, including organ transplantation, autoimmunity, immunodeficiencies, and viral diseases. Laboratory sessions will cover topics in immunochemistry, hematology, and diagnostic assays of immune competence. 

**BMSC 225A. Medical Microbiology.** (3) Lecture, thirty hours per quarter. Prerequisite: BMSC 224 or equivalent; fourth-year standing in the Biomedical Sciences Program, or M.S./Ph.D. status in the Biomedical Sciences Graduate Program, or consent of instructor. Reviews the major bacteria and fungi relevant to humans. Presents the major mechanisms of microbial pathogenesis, the corresponding clinical manifestations, and the principles of prevention, diagnosis, and treatment of bacterial infections. 

**BMSC 225B. Medical Microbiology.** (3) Lecture, three hours; laboratory, twenty hours per quarter. Prerequisite(s): BMSC 224 or equivalent; fourth-year standing in the Biomedical Sciences Program, or M.S./Ph.D. status in the Biomedical Sciences Graduate Program, or consent of instructor. Reviews the major viruses, fungi, and parasites that are pathogenic to humans. Presents the major mechanisms of microbial pathogenesis, the corresponding clinical manifestations, and the principles of prevention, diagnosis, and treatment of infectious diseases. Laboratory exercises emphasize the methodology involved in the isolation and identification of pathogenic bacteria. 

**BMSC 220A. General Pharmacology.** (5) Lecture, forty-nine hours per quarter. Prerequisite(s): fifth-year or M.S. or Ph.D. standing in Biomedical Sciences or consent of instructor. A study of the principles of pharmacology and their relationship to clinical medicine. Considers the major categories of drugs, mechanisms of drug action, toxicology, the pharmacological basis of therapeutic agents, and the effects of drugs on mammalian organ systems. Graded In Progress (IP) until BMSC 230A, BMSC 230B, and BMSC 230C are completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. 

**BMSC 220B. General Pharmacology.** (0.5) Lecture, five hours per quarter. Prerequisite(s): BMSC 220A, fifth-year or M.S. or Ph.D. standing in Biomedical Sciences or consent of instructor. A study of the principles of pharmacology and their relationship to clinical medicine. Considers the major categories of drugs, mechanisms of drug action, toxicology, the pharmacological basis of therapeutic agents, and the effects of drugs on mammalian organ systems. Graded In Progress (IP) until BMSC 230A, BMSC 230B, and BMSC 230C are completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. 

**BMSC 220C. General Pharmacology.** (0.5) Lecture, eight hours per quarter. Prerequisite(s): BMSC 220B; fifth-year or M.S. or Ph.D. standing in Biomedical Sciences or consent of instructor. A study of the principles of pharmacology and their relationship to clinical medicine. Considers the major categories of drugs, mechanisms of drug action, toxicology, the pharmacological basis of therapeutic agents, and the effects of drugs on mammalian organ systems. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 235A. Introduction to Psychiatry.** (2) Lecture, two hours. Prerequisite(s): BMSC 105; fifth-year standing in the Biomedical Sciences Program. A study of fundamental concepts of normal and abnormal sexuality and major psychiatric illnesses. Topics include depression, functional psychoses, organic mental disorders, and anxiety disorders. Graded In Progress (IP) until both BMSC 235A and BMSC 235B are completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. 

**BMSC 235B. Introduction to Psychiatry.** (2) Lecture, two hours. Prerequisite(s): BMSC 235A, fifth-year standing in the Biomedical Sciences Program. A study of fundamental concepts of normal and abnormal sexuality and major psychiatric illnesses. Topics include depression, functional psychoses, organic mental disorders, and anxiety disorders. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 240. General Pathology.** (3) Lecture, two hours; laboratory, three hours. Prerequisite(s): fourth-year standing in the Biomedical Sciences Program or consent of instructor. Human pathology covering basic alterations in cellular function in disease and their biochemical and clinical correlates. 

**BMSC 241. Preventive Medicine and Epidemiology.** (2) Lecture, one hour; seminar, one hour. Prerequisite(s): fifth-year standing in the Biomedical Sciences Program. Essentials of the epidemiological method and uses of epidemiology in medicine. Application of basic demographic and epidemiologic statistics to the measurement of disease processes in populations. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 245A. Pathophysiology of Disease.** (12) Lecture, eight hours; discussion, three hours; laboratory, three hours. Prerequisite(s): BMSC 240, fifth-year standing in the Biomedical Sciences Program or consent of instructor. Covers clinical manifestations and pathophysiology of disease and clinical pharmacology. Topics include cardiovascular, pulmonary, renal, alimentary, endocrine, and immunological systems. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 245B. Pathophysiology of Disease.** (10) Lecture, six hours; discussion, three hours; laboratory, three hours. Prerequisite(s): BMSC 245A, fifth-year standing in the Biomedical Sciences Program or consent of instructor. Covers clinical manifestations and pathophysiology of disease and clinical pharmacology. Topics include cardiovascular, respiratory, endocrine, and musculoskeletal systems. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 251. Colloquium in Biomedical Sciences.** (1) Colloquium, one hour. Prerequisite(s): graduate standing in Biomedical Sciences or consent of instructor. Specialized discussions by faculty and students of current research topics in biomedical sciences. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 252. General Seminar in Biomedical Sciences.** (1) Seminar, one hour. Prerequisite(s): graduate standing. Oral presentations by students on current research topics in biomedical sciences. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 254. Graduate Seminar in Biomedical Sciences.** (1) Seminar, one hour. Prerequisite(s): graduate standing. Oral reports by graduate students on current research topics in biomedical sciences. Letter grades will be assigned to students who present a seminar; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. 

**BMSC 255A. Doctoring I.** (3 1/2) Discussion, thirty-six hours per quarter. Prerequisite(s): fourth-year standing in the Biomedical Sciences Program. Introduction to small-group discussion of clinical cases, using a problem-based learning format. Cases are chosen to introduce basic interviewing skills and performance of a normal physical examination and to reinforce material presented in other courses. Includes sessions in a clinical setting with a community physician preceptor. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 255B. Doctoring II.** (3 1/2) Discussion, three hours per week; clinic, fifteen hours per quarter. Prerequisite(s): BMSC 255A; fourth-year standing in the Biomedical Sciences Program. Introduction to small-group discussion of clinical cases, using a problem-based learning format. Cases are chosen to introduce basic interviewing skills and performance of a normal physical examination and to reinforce material presented in other courses. Includes sessions in a clinical setting with a community physician preceptor. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 256A. Doctoring II.** (5) Discussion, four hours; clinic, three hours. Prerequisite(s): BMSC 255A, BMSC 255B, BMSC 255C; fifth-year standing in the Biomedical Sciences Program. Involves small-group discussion of cases, using a problem-based learning format. Cases are chosen to introduce advanced interviewing skills and to teach differential diagnosis. Includes sessions in a clinical setting with a community physician preceptor. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 256B. Doctoring III.** (5) Discussion, four hours; clinic, three hours. Prerequisite(s): BMSC 255A, BMSC 255B, BMSC 255C, BMSC 256A; fifth-year standing in the Biomedical Sciences Program. Includes small-group discussions of clinical cases, using a problem-based learning format. Cases are chosen to introduce advanced interviewing skills and to teach differential diagnosis. Includes sessions in a clinical setting with a community physician preceptor. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 256C. Doctoring IV.** (2) Discussion, one hour; clinic, three hours. Prerequisite(s): BMSC 255A, BMSC 255B, BMSC 255C, BMSC 256A, BMSC 256B; fifth-year standing in the Biomedical Sciences Program. Includes small-group discussions of clinical cases, using a problem-based learning format. Cases are chosen to introduce advanced interviewing skills and to teach differential diagnosis. Includes sessions in a clinical setting with a community physician preceptor. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 270A. Introduction to Patient Examination.** (2) Seminar, two hours. Prerequisite(s): fifth-year standing in the Biomedical Sciences Program. Introduction to the principles of clinical interviewing and patient examination. Emphasis is placed on the techniques of medical history taking and on developing skills of physical diagnosis. Graded Satisfactory (S) or No Credit (NC). 

**BMSC 270B. Introduction to Patient Examination.** (2) Seminar, two hours. Prerequisite(s): fifth-year standing in the Biomedical Sciences Program. Introduction to the principles of clinical interviewing and patient examination. Emphasis is placed on the techniques of medical history taking and on developing skills of physical diagnosis. Graded Satisfactory (S) or No Credit (NC).
BMSC 280. Biochemistry (1-3) Principles of biochemistry as a foundation of life. Prerequisite(s): BMSC 287 or consent of instructor. Oral reports in biochemistry topics. Cross-listed with CHEM 280.

BMSC 287. Colloquium in Neuroscience. (1) Colloquium, one hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports on current research topics in neuroscience with presentations by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 287, BIOL 289, CHEM 289, NSRC 287, and PSYC 287. Hatton in charge.

BMSC 289. Special Topics in Neuroscience. (2) Seminar, two hours. Prerequisite(s): graduate standing or consent of instructor. An interdisciplinary seminar consisting of student presentations and discussions of selected topics in neuroscience. Content and instructor(s) vary each time course offered. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 289, BIOL 289, CHEM 289, ENTM 289, NSRC 289, and PSYC 289. Hatton in charge.

BMSC 290. Directed Studies. (1-6) Research, three to eighteen 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 297. Directed Research. (1-6) Research, three to eighteen 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) Research, three to thirty-six 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, six 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.

David A. Eastmond, Ph.D. (Cell Biology and Neuroscience)
Andrew J. Grosowsky, Ph.D. (Cell Biology and Neuroscience)
Helen L. Henry, Ph.D. (Biochemistry)
Edward G. Platter, Ph.D. (Biological/Neuroscience)
Paul M. Quinton, Ph.D. (Biomedical Sciences)
Neal L. Schiller, Ph.D. (Biomedical Sciences)
B. Glenn Stanley, Ph.D. (Cell Biology and Neuroscience)
Michael B. Stemerman, M.D. (Biomedical Sciences)
Brian S. Strauss, Ph.D. (Biomedical Sciences/Biology)
Amea M. Walker, Ph.D. (Biomedical Sciences)

Associate Professors

Margarita C. Currás-Collazo, Ph.D. (Cell Biology and Neuroscience)
Scott N. Carrie, Ph.D. (Cell Biology and Neuroscience)
Christian Y. Yule, Ph.D. (Biomedical Sciences)
Manuela M. Martins-Green, Ph.D. (Cell Biology and Neuroscience)
John Y-J. Shyy, Ph.D. (Biomedical Sciences)

Assistant Professors

Kathryn DeFea, Ph.D. (Biomedical Sciences)
Douglas W. Eihell, Ph.D. (Biomedical Sciences)
Iryna M. Ethell, Ph.D. (Biomedical Sciences)
Xuan Liu, M.D., Ph.D. (Biochemistry)
Ernest Martinez, Ph.D. (Biochemistry)

The multidisciplinary interdepartmental graduate program in Biomedical Sciences offers graduate instruction leading to a Ph.D. or combined M.D.—Ph.D.

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 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.

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 mechanisms for carcinogenesis by tumor-promoting phorbol esters.

Neurosciences research areas include studies of the hypothalamic control of homeostatic and sexual function; plasticity in the adult mammalian nervous system; chemical and electrophysiological mechanisms of synaptic transmission; and structure–function studies of ion channels.

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 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. BCH 110A and BCH 110B (General Biochemistry), and BCH 110C or BIOI 107A are considered prerequisites to the core curriculum. Students who perform well on a biochemistry placement examination at the time of matriculation are not required to enroll in the BCH 110A, BCH 110B, and BCH 110C sequence.
Core requirements include:

1. BMSC 202
2. Three special topics courses (selected from BMSC 222, BCH 230, BIOL 281 (E-Z)/CMDB 281 (E-Z), or NRSC 289/BCH 289/BIOL 289/BMSC 289/CHM 289/ENTM 289/PSYC 289)
3. BMSC 252 (enrollment required each quarter)
4. BMSC 254 (enrollment required each quarter and presentation of at least one seminar per year)
5. BMSC 302 (two-quarter requirement, not required of M.D.–Ph.D. students)

Elective requirements require completion of any four courses from the following list:

- BMSC 120/BCH 120, BMSC 200A and BMSC 200B (counts as two), BMSC 201, BMSC 205, BMSC 210A and BMSC 210B (counts as two), BMSC 220, BMSC 224, BMSC 225A and BMSC 225B (counts as one), BMSC 230A, BMSC 230B, BMSC 230C, BCH 210, BCH 211, BCH 212, BIOL 115, BIOL 200/CMDB 200, BIOL 201/CMDB 201, CMDB 202, ENTX 211, NRSC 200A/PSYC 200A, NRSC 200B/PSYC 200B, NRSC 200C/PSYC 200C, NRSC 201, NRSC 211

Under normal circumstances, each student should complete course work requirements some time during the second 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.

**Qualifying Examination** 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 that covered 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. After successful completion of the qualifying exam and advancement to candidacy, the student complete a comprehensive examination, 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**

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. For students in the Biomedical Sciences Program, this track allows them to complete a B.S., M.D., and Ph.D. degree in 10 years. 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 GRE is accepted in lieu of the MCAT.

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 a master’s degree program. 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.
Cooperating Faculty
Richard J. Debus, Ph.D. (Biochemistry)
Daniel R. Galie, Ph.D. (Biochemistry)
Bradley C. Hyman, Ph.D. (Biology)
Igoshi Kaloshian, Ph.D. (Nematology)
Paul B. Larsen, Ph.D. (Biochemistry)
Justin K.M. Roberts, Ph.D. (Biochemistry)

MAJOR
The Departments of Botany and Plant Sciences, Plant Pathology, and Nematology participate in an interdepartmental program leading to either a B.A. or B.S. degree in Botany and Plant Sciences. In addition, these departments and others participate in the Plant Biology Track within the interdisciplinary Biological Sciences major. In this program, students earn a B.S. degree in Biological Sciences. Course requirements for the Plant Biology Track are listed under the Biological Sciences major in this catalog.

Both majors are designed to provide students with basic knowledge in the natural sciences and in their chosen field 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 Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North, Monday through Friday, 9 a.m. to noon and 1 to 4 p.m., [909] 787-4186).

Career Opportunities
Appropriate selection of courses within either major prepares students for employment and graduate training in a variety of fields including botany, ecology, genetics, nematology, plant breeding, plant pathology, plant physiology, and plant sciences.

These specialties can prepare students for teaching, research and other career opportunities in basic and applied botany and plant ecology; medical fields; biotechnology; agricultural extension, consultation or management; botanic garden, nursery, landscape and turfgrass management; crop production and protection; and many related botanical and agricultural industries.

Transfer Students
Transfer students majoring in Botany and Plant Sciences should make every effort to complete the following full-year sequences:

1. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C
2. Organic chemistry, equivalent to CHEM 112A, CHEM 112B, CHEM 112C
3. First-year calculus, equivalent to MATH 009A, MATH 009B

Degree 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.

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 Botany and Plant Sciences are as follows:

1. Life Sciences core requirements (65–68 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 051A, BIOL 005B, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 112A, CHEM112B, CHEM 112C
   c) MATH 009A, MATH 009B (MATH 009C recommended)
   d) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 021A, PHYS 021B, PHYS 021C
   e) STAT 100A or STAT 105 or STAT 120A (STAT 120A is strongly recommended)
   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 24 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 16 units required from an area of specialization.

2. Upper-division requirements (36–52 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/BPLL 104
   c) Three courses from the following:
      BIOL 107A, BPSC 152/BPLL 152, BPSC 153, BPSC 138/BPLL 138, BPSC 143/BPLL 143, BPSC 146
   d) For the B.S. 24 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 BPLL 190 and/or BPSC 197 (alone or in combination) to bring total units to 52.
   e) For the B.A. 16 units from one of the four areas of specialization (consult with a faculty advisor) and 2 units of BPSC 197.

   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 (Genetics, Biotechnology)

   a) BIOL 102, BIOL 110A, BIOL 110B, BIOL 110C or BIOL 107A, BIOL 162, BIOL 184, BIOL 105, BIOL 107B, BIOL 108, BIOL 115, BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 121C/MCBL 121C, BPSC 135, BPSC 144, BPSC 148, BPSC 150, BPSC 153/BPLL 153 or BIOL 109, BPSC 155/BPLL 155, BPSC 185/BPLL 185, CBNS 101, CBNS 128/BPLL 128, CBNS 150/ENTX 150, CHEM 109, ENTX 100/BPLL 100, ENTX 112/BPLL 112, ENSC 100, ENSC 100E, NEM 105/BIOL 105, NEM 159/BIOL 159, NEM 185/BPLL 185, NEM 186/BPLL 186, STAT 120A, STAT 120B, SWSC 100L

2. Organismal Botany and Plant Sciences (Anatomy, Biochemistry, Development, Morphology, Physiology, Horticulture, Agronomy, Botany)

   a) BIOL 102, BIOL 183, BIOL 107A, BIOL 107B, BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 121L/MCBL 121L, BPSC 135, BPSC 144, BPSC 153/BPLL 153 or BIOL 109, BPSC 155/BPLL 155, BPSC 158, BPSC 166, BPSC 185/BPLL 185, CBNS 101,

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CHEM 109, ENSC 100, ENSC 100L, NEM 159/BIOL 159, PLPA 120/BIOL 120/MCBL 120, PLPA 120/BIOL 120/MCBL 120L, PLPA 123/BIOL 123/MCBL 123, PLPA 134/BIOL 134, PLPA 134/BIOL 134L, STAT 120A, STAT 120B, SWSC 100L, SWSC 104/ENSC 104, SWSC 111, SWSC 124, SWSC 154/BPSC 154/ENSC 134


ANTH 110, ANTH 111, ANTH 129, BCH 102, BCH 183, BIOL 105, BIOL 108, BIOL 117 or ENTM 127/BIOL 127, BIOL 118, BPSC 144, BPSC 146, BPSC 158, BPSC 165/BIOL 165, BPSC 166, BPSC 170/ANTH 170, ENTM 112/BPSC 112, ENSC 100, ENSC 100L, GEO 151, NEM 159/BIOL 159, PLPA 120/BIOL 120/MCBL 120, PLPA 120L/BIOL 120L/MCBL 120L, PLPA 134/BIOL 134, PLPA 134L/BIOL 134L, STAT 120A, STAT 120B, SWSC 100L, SWSC 104/ENSC 104, SWSC 111, SWSC 124, SWSC 154/BPSC 154/ENSC 134

4. Pest Management, Plant Pathology, and Nematology

BCH 183, BIOL 121A/MCBL 121A, BIOL 121B/MCBL 121B, BIOL 121L/MCBL 121L, BPSC 146, BPSC 150, BPSC 158, BPSC 166, ENTM 100/BIOL 100, ENTM 109, ENTM 124, ENTM 127/BIOL 127, ENTM 129, ENTM 129L, ENSC 100, ENSC 100L, NEM 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, STAT 120A, STAT 120B, SWSC 100L, SWSC 104/ENSC 104, SWSC 111

Minor

The Minor in Botany and Plant Sciences allows students majoring in other departments to obtain in-depth training in Botany and Plant Sciences.

Requirements for the Minor in Botany and Plant Sciences are as follows:

1. BIOL 104/BPSC 104 (4 units)
2. One course (4 units) from the following:
   BIOL 132/BPSC 132, BIOL 138/BPSC 158, BIOL 143/BPSC 143
3. Twelve (12) to 20 units from the following:
   ANTH 170/BPSC 170, BCH 153/BIOL 153/BPSC 153, BCH 185/BPSC 185, BIOL 132/BPSC 132, BIOL 138/BPSC 138, BIOL 143/BPSC 143, BIOL 155/BPSC 155, BIOL 165/BPSC 165, BPSC 135, BPSC 144, BPSC 146, BPSC 148, BPSC 150, BPSC 158, BPSC 166, BPSC 190, BPSC 197, BPSC 199

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 Undergraduate Studies 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 Botany or Plant Science, and to the Ph.D. degree in Plant Biology or Plant Science (Plant Genetics).

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. Graduate Record Examination scores (verbal, quantitative, and analytical) must be submitted for the department for admission to the Ph.D. program; also, domestic applicants to the M.S. programs are required to submit these scores.

Regardless of the area of their major for the baccalaureate degree, students are expected to have had, or complete soon after entering graduate school, a year course in general biology, general chemistry, organic chemistry, and physics; mathematics through integral calculus; and a course in genetics, biochemistry, and statistics. Credit from these courses does not count toward the graduate degree. See additional requirements in doctoral degree section.

Each student should consult with the graduate advisor regarding educational goals and scheduling. When an area of specialization has been determined, a faculty advisor who provides further counsel in outlining the student’s program may be assigned.

Master's Degree

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 or the Plant Science 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 towards fulfilling the Section II requirement, the same course may not be used towards fulfilling the Plan I or Plan II requirements.
3. At least 6 units from Section III of either the Botany or the Plant Science 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 or Plant Science 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 towards fulfilling the Section II requirement, the same course may not be used towards fulfilling the Plan I or Plan II requirements.
3. At least 12 units from Section III of either the Botany or Plant Science 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 in residence in the M.S. program must enroll in the BPSC 250 and BPSC 260 seminars during each quarter in which they are offered. Part-time students must take one BPSC 250 and one BPSC 260 seminar for every 12 units of courses. Students may enroll in an equivalent seminar course as a replacement for the BPSC 260 seminar. All students must present at least one BPSC 250 seminar and complete at least two quarters of BPSC 240 (or equivalent) during the master’s program.
Courses available for fulfilling the requirement for the M.S. degree:

Section I — Upper-division undergraduate courses:

Botany M.S.

ANTH 170/BPS 170, BCH 153/
BIOL 153/BPS 153, BCH 185/BPS 185,
BIOL 104/BPS 104, BIOL 120/MCB 120/
PLPA 120, BIOL 152/BPS 152, BIOL 158/
BPSC 158, BIOL 145/BPS 145, BIOL 155/
BPSC 155, BIOL 165/BPS 165, BPSC 135,
BPSC 144, BPSC 146, BPSC 148, CENS 111

Plant Science M.S.

BIOL 104/BPS 104, BIOL 143/BPS 143,
BPSC 148, BPSC 150, 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 M.S.

BCH 231/BPS 231, BIOL 232/BPS 232,
BPSC 201 (E-Z) (for a maximum of 2
units), BPSC 230L, BPSC 233, BPSC 237,
BPSC 239, BPSC 240 (only if taken in addition

to the required seminar units; see

Seminar requirement), BPSC 245

Plant Science M.S.

BCH 231/BPS 231, BIOL 232/BPS 232,
BPSC 201 (E-Z) (for a maximum of 2
units), BPSC 220, BPSC 221, BPSC 222,
BPSC 230L, BPSC 233, BPSC 237,
BPSC 239, BPSC 240 (only if taken in addition

to the required seminar units; see

Seminar requirement), BPSC 245

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 student must meet the general requirements of the Graduate Division. 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 145, BPSC 146). Course requirements for each student are determined by individual guidance committees and by the educational advisory committee. During the first quarter in residence, students meet with a guidance committee to choose an area of specialization in Plant Biology or Plant Biology (Plant Genetics) 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. Students are required to take a minimum of three graduate-level courses 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.

Ph.D. in Plant Biology

(Concentration in Plant Cell, Molecular, and Developmental Biology)

In addition to all other department requirements, students must complete the following to earn the concentration in Plant Cell, Molecular, and Developmental Biology (appears on the transcript only):

1. BPSC 231, BPSC 232, BPSC 237
2. One 240 course related to the concentration

Qualifying Examination

Advancement to candidacy depends on the student passing a written and oral qualifying examination. The qualifying examination covers the student’s area of specialization and two minor areas.

Qualifying Examination

Advancement to candidacy depends on the student passing a written and oral qualifying examination. The qualifying examination covers the student’s area of specialization and two minor areas. Grading 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 and BPSC 260 seminars during each quarter in which they are offered. Students may enroll in an equivalent seminar course as a replacement for BPSC 260. Also, students must present at least one BPSC 250 seminar in addition to the defense of the dissertation. The dissertation defense is normally presented in the BPSC 250 seminar series; however, if necessary, a special seminar may be scheduled for the defense. All students must complete at least two quarters 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

UPPER-DIVISION COURSES

BPSC 031. Spring Wildflowers. (4) S Lecture, three hours; discussion, one hour. 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. Kim

BPSC 104. Foundations of Plant Biology. (4) F,S Lecture, three hours; laboratory, three 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. Kim

BPSC 112. Systematics. (4) F Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005C or equivalent. Principles and philosophy of classification. Topics include phylogenetic and phenetic methods, species concepts, taxonomic characters, evolution, hierarchical categories, and nomenclature. Cross-listed with BIOL 112 and ENTM 112. Heraty, Kim

BPSC 132. Plant Anatomy. (5) F Lecture, three hours; laboratory, six 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. (4) Lecture, two hours; laboratory, three hours; three one-day Saturday field trips. Prerequisite(s): BIOL 005A, BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 011C, MATH 010B or MATH 010B, PHYS 002C, PHYS 012C, BCH 100 and BCH 110A (BCH 100 or BCH 110A may be taken concurrently), BIOL 104/BPSC 104, or consent of instructor. Introduces the principles and methods of identifying, naming, and classifying flowering plants. Surveys selected flowering plant families in California and shows their interrelationships. Kim

BPSC 134. Soil Conditions and Plant Growth. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 104/BPSC 104, ENSC 100; 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 WSC 134. Parker

BPSC 135. Plant Cell Biology. (3) W Lecture, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, BCH 100 or BCH 110C, 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. Morphology of Vascular Plants. (4) S Lecture, two hours; laboratory, six hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 011C, MATH 009B or MATH 010B, PHYS 002C, PHYS 012C, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), BIOL 104/BPSC 104, or consent of instructor. Investigates the comparative morphology and evolution of vascular plants from the viewpoint of fossil and living representatives, with a focus on the Angiosperms. Cross-listed with BIOL 138. Lord
BPSC 143. Plant Physiology. (4) W Lecture, three hours; laboratory, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 011C, CHEM 112C, MATH 009B or MATH 091B, PHYS 002C, PHYS 002C1, PHYS 100B, 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 processes underlying crop physiology, including photosynthesis, water relations, mineral nutrition, growth, morphogenesis, plant hormones, dormancy, and senescence. Cross-listed with BIOL 143.

BPSC 144. Biosystematics. (4) S, Even Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005C or consent of instructor. Discussion of the nature and causes of plant variation within and among species and the use of various methods used to gather such information. Topics include the integration of data with evolutionary hypotheses to determine taxonomic and evolutionary relationships among plant species.

BPSC 146. Plant Ecology. (4) S, Even Years Lecture, three hours; laboratory, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 011C, CHEM 112C, MATH 009B or MATH 091B, PHYS 002C, PHYS 002C1, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently), BIOL 104/BPSC 104 or consent of instructor. A study of the fundamentals of plant ecology emphasizing community ecology, environ- ment, life history, population dynamics, species interactions, succession, disturbance, and special topics in applied ecology. Cross-listed with BIOL 146.

BPSC 148. Quantitative Genetics. (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 102; STAT 100B or STAT 120A; or consent of instructor. Examines approaches to studying the genetic basis of polygenic traits. Topics include 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.

BPSC 150. Principles of Plant Breeding. (4) W, Even Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 102; STAT 100B or STAT 120A recommended. Application of the principles of classical, quantitative, and molecular genetics to the development of improved cultivars of crop plants. Cross-listed with BIOL 150.

BPSC 153. Plant Genomics and Biotechnology Laboratory. (4) F, Odd Years Lecture, one hour; discussion, one hour; laboratory, six hours. Prerequisite(s): BCH 110C or BIOL 107A; upper-division standing; consent of instructor. 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, nutrition- al, medicinal, and societal relevance; and regulatory issues. Cross-listed with BCH 153 and BIOL 153. Credit is awarded for only one of BCH 153/BIOL 153/BPSC 153 or BIOL 109. Cross-listed with BIOL 155.

BPSC 155. Chromosomes. (4) F Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 011C, CHEM 112C, MATH 009B or MATH 091B, PHYS 002C, PHYS 002C1, 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.

BPSC 158. Subtropical and Tropical Horticulture. (4) F, Even Years Lecture; four hours; occasional field trips. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, BIOL 104/BPSC 104, CHEM 001C or CHEM 011C, CHEM 112C, MATH 009B or MATH 091B, PHYS 002C, PHYS 002C1; or consent of instructor. Studies the important subtropical and tropical crops of the world, emphasizing plants, including citrus and avocado, with special reference to their botany, germplasm resources, climatic adaptation, and culture. Cross-listed with BIOL 158.

BPSC 165. Restoration Ecology. (4) W Lecture, three hours; two one-day field trips; three half-day field trips. Prerequisite(s): BIOL 005C, BIOL 117, CHEM 112C, STAT 020 or STAT 100A (STAT 020 or STAT 100A may be taken concurrently); or consent of instructor. BIOL 102 is recommended. An examination of the basic ecological principles related to land restoration. Topics include enhanced succession, plant establishment, plant adaptations, ecosystem colonization, 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.

BPSC 166. Environmental Plant Physiology. (4) Lecture, three hours, discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, BIOL 104/BPSC 104, CHEM 001C or CHEM 011H, CHEM 112C, MATH 009B or MATH 091B, PHYS 002C, PHYS 002C1; or consent of instructor. Topics include plant responses to light, temperature, evaporative demand, and water relations, and plant-temperature relationships. Gives attention to plant adaptation to climates with varying aridity and temperature extremes.

BPSC 170. Ethnobotany. (4) S Lecture, two hours; seminar, one hour; discussion, one hour. Prerequisite(s): BIOL 104/BPSC 104 or consent of instructor. Introduces students to the field of ethnobotany through 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 guest and enrolled students present selected topics in ethnobotany. Cross-listed with ANTH 170.

BPSC 185. Molecular Evolution. (4) S, Odd Years Lecture, two hours; discussion, two hours. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 108 recommended. Explores the evolution of genes, proteins, and genomes at the molecular level. Focuses on the processes that drive molecular evolution. Attention also given to the analysis of molecular data within the framework of evolutionary theory. Cross-listed with BCH 185.

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 197. Research for Undergraduates. (1-4) F,W,S Individual research, three to twelve 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 199. Senior Research. (2-4) F,W,S Laboratory, six to twelve hours. Prerequisite(s): senior status; a GPA of 3.2 or better in upper-division courses in Botany and Plant Science; 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.

BPSC 201 (E-Z). Methods in Plant Biology. (1-2) F,S Laboratory, three to six hours. Prerequisite(s): consent of instructor. 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.

BPSC 210. Methods In Arabidopsis Research. (4) F, Even Years Lecture, one hour; discussion, one hour; laboratory, six 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 andinsertional mutagenesis, genetic mapping techniques, nucleic acid isolation and manipulation, transformation, and internet resources. Cross-listed with BIOL 210.

BPSC 211. Advanced Plant Breeding. (4) S, Even Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 150 and either BPSC 148 or consent of instructor. 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, disease and stress resistance; and use of biotechnology. Cross-listed with BIOL 211.

BPSC 212. Origins of Agriculture and Crop Evolution. (3) W, Odd Years Lecture, three hours; discussion, one hour. 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. Cross-listed with BIOL 212.

BPSC 223. Applied Evolutionary Genetics. (4) W, Odd Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 105, BIOL 108; or consent of instructor. An in-depth exploration of evolutionary changes resulting from anthropogenic activities, focusing on genetic changes in populations that affect human well-being. Examines current topics such as conservative genetics, evolution of resistance, and evolutionary impacts of changing technology. Readings in primary literature and popular media interpretations of that literature. Cross-listed with BIOL 223.

BPSC 230L. Cytogenetics Laboratory. (3) S, Odd Years Laboratory, nine hours. Prerequisite(s): BIOL 155/BPSC 155 or equivalent. An advanced laboratory course in cytogenetics covering current methods of fixation, staining, and observation of chromosomes in eukaryotic organisms. Topics include methods for observation of polyene chromosomes of Drosophila, chromosome banding techniques, and in situ hybridization. Cross-listed with BIOL 230.

BPSC 231L. The Plant Genome. (4) W Lecture, three hours; discussion, one 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 and regulation, expression, transposons, and methods of gene introduction are also emphasized. Cross-listed with BCH 231.

Bailey-Serres, Walling
BPSC 232. Plant Development. (4) S, Odd Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 107A or BIOL 143/BPSC 143; or consent of instructor. An examination of plant development, with emphasis on the genetic mechanism used in patterning plant form. Topics are taken from current literature and focus on molecular and cellular mechanisms. Cross-listed with BIOL 232. Springer.

BPSC 233. Molecular Responses of Plants to the Environment. (4) S, Even Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 107A, BIOL BIOL 143/BPSC 143; or consent of instructor. Molecular-level responses to the environment; mechanisms of gene regulation, including those involving plant hormones; and inheritance of these responses and regulatory mechanisms will be discussed. Environmental factors discussed will include light, nutrients, abiotic and biotic stress, and herbicides. Bray, Close.

BPSC 234. Statistical Genomics. (4) F, Even Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 102, STAT 120A, STAT 120B; 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. Statistical techniques include analysis of least squares and maximum likelihood, Bayesian analysis, and Markov chain Monte Carlo algorithm. Xu.

BPSC 237. Plant Cell Biology. (4) F, Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 107A or BIOL 143/BPSC 143 or BCH 100 or CNS 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. Nothnagel, Yang.

BPSC 239. Plant Metabolism. (3) W, Lecture, three hours. Prerequisite(s): consent of instructor. Recent and important advances in plant metabolism related to organelle physiology and carbon assimilation.

BPSC 240. Special Topics in Plant Biology. (2-6) F, W, S, Seminar, two 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. Environmental Plant Physiology. (4) S, Odd Years Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 107A or BIOL 143/BPSC 143 or BCH 100 or CNS 101 or their equivalents, or consent of instructor. Explores the fundamental ecological concepts, theoretical developments, quantitative methods, and experimental results involved in multi-scale 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 245. Advanced Plant Ecology. (4) F, Even Years Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 090C or MATH 09HC, STAT 100B or STAT 100A 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 multi-scale 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 250. Seminar in Plant Biology. (1-5) S, Seminar, one hour. Prerequisite(s): graduate standing or consent of instructor. Intensive study of selected topics in plant biology. Letter grades are assigned to students who present formal seminars; other students receive Satisfactory (S) or No Credit (NC) grades. Course is repeatable.

BPSC 252. Special Topics in Botany/Plant Science. (1-5) F, W, Seminar, one 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 260. Seminar in Plant Physiology, Botany, or Genetics. (1) W, Seminar, one hour. Prerequisite(s): graduate standing or consent of instructor. Lectures, discussions, and demonstrations by students, faculty, and invited scholars on selected topics concerned with the principles of plant physiology, botany, or genetics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

BPSC 261. Colloquium in Recombinant DNA. (1) WS, Seminar, one hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports by visiting scholars, faculty, and students on current research topics in recombinant DNA. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, ENTM 261, and PLPA 261.

BPSC 280. Maya Subsistence and Biodiversity. (2-12) Lecture, ten hours per quarter; discussion, ten hours per quarter. Prerequisite(s): graduate standing or consent of instructor. A field course based on an interdisciplinary research program on the biodiversity of the Maya region of Mexico and the subsistence systems of the present and ancient Maya people. Includes independent research, lecture, readings, discussions, and visits to different field projects, research institutions, protected areas, and agroecosystems in the region. There is a fee associated with this course; fellowships may be available. See instructor for details. Graded Satisfactory (S) or No Credit (NC). Gómez-Pompa.

BPSC 290. Directed Studies. (1-6) F, W, S, Individual study, two to eighteen 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. (1-4) 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 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, three to twelve 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, three to eighteen 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.

BPSC 302. Teaching Practicum. (1-4) F, W, 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: BSAD

Bajs M. Dodin, Ph.D., Chair
Committee Office, 158 Anderson Hall
(909) 787-4551; agsm.ucr.edu

**Committee in Charge**

Susan Carter, Ph.D. (Economics)
Bajs M. Dodin, Ph.D. (Management)
John Hiskay, Ph.D. (Political Science)
Herbert Johnson, Ph.D. (Management)
Kathleen Montgomery, Ph.D. (Management)
Raymond L. Russell, III, Ph.D. (Sociology)
Patricia O’Brien, Ph.D.
Dean, College of Humanities, Arts, and Social Sciences, ex officio

Y. Peter Chung, Ph.D.
Interim Dean, The A. Gary Anderson Graduate School of Management, ex officio

**Faculty**

(See Management Faculty)

**MAJORS**

The B.S. in Business Administration is designed to educate students in the art and science of management. The program prepares graduates to become tomorrow’s business leaders by equipping them with the ability to identify, analyze, and solve complex business problems. Thus, the curriculum is built on strong business fundamentals with a foundation of course work in the humanities, social, and natural sciences. The B.S. in Business Administration is a two-year upper-division major offered jointly by The A. Gary Anderson Graduate School of Management (AGSM) and the College of Humanities, Arts, and Social Sciences (CHASS). 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 AGSM. The B.S. degree in Business Administration is conferred by CHASS. 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 less than 75 and not more than 120 quarter units of college work. Final acceptance into the major is based on completion of all prerequisites and breadth requirements within a 120 quarter unit limit, a GPA above 2.00 in prerequisites, and a cumulative GPA of at least 2.50. (Students who have not completed the
foreign language requirement may be accept- ed into the program, but they must complete the requirement before graduation.) Exceptions to the 120 quarter unit maximum must be requested by petition.

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.

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, and the Deloitte and Touche Scholarship.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

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 University of California. See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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 (41–44 units)
   a) General prerequisites (may be used to satisfy breadth requirements of the College of Humanities, Arts, and Social Sciences)
      (1) ECON 002, ECON 003
      (2) CS 008
      (3) STAT 048 or PSYC 011 (or equivalent)
      (4) SOC 110A or PSYC 012 or ANTH 175B or ECON 111 (or equivalent)
      (5) MATH 022, MATH 023 (or equivalents)
   b) Major prerequisites (may not be used to satisfy breadth requirements)
      (1) BSAD 010
      (2) BSAD 020A, BSAD 020B

The major requirements for the B.S. in Business Administration are as follows:

2. Upper-division major requirements (72 units)
   a) BSAD 110, BSAD 126, BSAD 163, BSAD 170, BSAD 184
   b) BSAD 121/STAT 121
   c) BSAD 134/ECON 134
   d) Two courses from
      (1) PSYC 142
      (2) SOC 150, SOC 151
      e) ECON 102A, ECON 103A
      f) PHIL 116
      g) POSC 182 or POSC 186
   h) An additional 20 units of Business Administration elective courses excluding BSAD 190. See department for a list of approved Business Administration elective courses.

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.

1. All requirements of the College of Humanities, Arts, and Social Sciences
2. Specified requirements of the relevant department, to include at least 36 upper-division units in that discipline
3. Administrative Studies requirements (37 units)
   a) Four lower-division courses (17 units)
      (1) BSAD 010, BSAD 020A
      (2) STAT 048 or equivalent (may be used to satisfy breadth requirements)
      (3) CS 008 (may be used to satisfy breadth requirements)
   b) Two upper-division courses (8 units) from the list below:
      (1) ECON 102A or ECON 130 or ECON 162/BSAD 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 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:
      (1) Organizations (General): BSAD 105/ANTH 105, BSAD 176/SOC 176, SOC 150, SOC 151
      (2) Human Resources Management/Labor Relations: BSAD 152/ECON 152, BSAD 153/ECON 153, BSAD 155, BSAD 157, PSYC 142
      (3) Business and Society: BSAD 161, PHIL 116, POSC 182, POSC 186
      (4) Marketing: BSAD 110, and two from BSAD 112, BSAD 113, BSAD 114 or BSAD 117
      (5) Managerial Accounting/Taxation: BSAD 163, and two from BSAD 166, BSAD 168A, or BSAD 168B
      (6) Financial Accounting: BSAD 165, BSAD 165A, BSAD 165B
      (7) Finance: BSAD 134/ECON 134 and two from BSAD 135A, BSAD 136, BSAD 137, BSAD 138, BSAD 139
      (8) Management Information Systems: BSAD 170, BSAD 171, BSAD 173
      (9) Production Management: BSAD 121/STAT 121, and two from BSAD 122, BSAD 126, BSAD 127/STAT 127

Minor

Prerequisites for the minor in Business Administration are as follows:

1. Three lower-division courses (13 units)
   (must be completed with no grade lower than “C”): BSAD 020A, ECON 003, STAT 048

Requirements for the minor in Business Administration are as follows:

2. Six upper-division courses (24 units): a) Four courses from the following:
   BSAD 110, BSAD 121/STAT 121, BSAD 126, BSAD 134/ECON 134, BSAD 163, BSAD 170, PHIL 116
   b) Two additional upper-division Business Administration courses.

LOWER-DIVISION COURSES

BSAD 010. Introduction to Business. (4) Lecture, three hours; discussion, one 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.

BSAD 020A. Principles of Accounting I. (4) Lecture, three hours; discussion, one hour. Study of the concepts and techniques for measurement and communication of financial information. An introduction to accounting theory and practice as related to the single proprietorship, with emphasis on service and merchandising transaction analysis, and recording and summarizing procedures used in preparing various financial statements.
BSAD 020B. Principles of Accounting II. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BSAD 020A or equivalent. Continuation of study of accounting principles with emphasis on partnerships and corporations. Topics include stock and bond issuances, present value concept as related to accounting, introduction to consolidation and intercompany investments, special financial statements and financial statement analysis, and partnership formation and liquidation.

BSAD 105. Organizations as Cultural Systems. (4) Lecture, three hours; outside reading, three hours. 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. Cross-listed with ANTH 105.

BSAD 110. Introduction to Marketing. (4) Lecture, three hours; discussion, one 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.

BSAD 111. Services Marketing. (4) Lecture, three hours; outside project, three hours. Prerequisite(s): BSAD 110. 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.

BSAD 112. Consumer Behavior. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 110. Provides an 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.

BSAD 113. Marketing Institutions. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 110. Provides an understanding of the marketing environment and examines the development of marketing strategies to maximize growth of global companies.

BSAD 115. Marketing Research. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): BSAD 110. The concepts and strategies relating to the delivery of consumer goods and services. The management of marketing activities within the channels of distribution will be the main topic of study with emphasis upon retail and wholesale institutions.

BSAD 114. Marketing in a Global Environment. (4) Lecture, three hours; outside research, two hours; term paper, one hour. Prerequisite(s): BSAD 110. 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.

BSAD 116. Advertising. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 110. Covers the application of traditional marketing principles to an electronic commerce environment and new marketing techniques made possible by this environment.

BSAD 121. Introduction to Management Science. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 0102 and GS 008, or their equivalent. Focuses on decision making. Survey of deterministic and probabilistic models for decision making. Topics include linear programming and extensions, networks, dynamic programming, decision trees, queuing models, and simulation. Use of these models in decision making are discussed. Use of the computer is emphasized. Cross-listed with STAT 121.

BSAD 122. Linear Programming with Applications. (4) Lecture, three hours; homework problems and projects, three hours. Prerequisite(s): BSAD 121/STAT 121 or equivalent. Many real-life decision problems give rise to linear programs with special structures, network flow problems, integer programs, and large-scale programs. Theory and algorithms of these models are presented and applied to various decision problems in management. Use of computer packages is emphasized.

BSAD 126. Production and Operations Management. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BSAD 121/STAT 121 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.

BSAD 127. Introduction to Quality Improvements. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): STAT 048 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, accelerated life testing. Cross-listed with STAT 127.

BSAD 128. Project Planning and Control. (4) Lecture, three hours; assigned problems and field project, three hours. Prerequisite(s): BSAD 121/STAT 121. 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.

BSAD 129. Supply Chain Management. (4) Lecture, three hours; assigned problems, three hours. Prerequisite(s): BSAD 126 or consent of instructor. 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.

BSAD 134. Corporate Finance and Investment. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 005; upper-division standing. BSAD 020A and BSAD 020B recommended. Covers the foundations of corporate financial decision making, risk measurement, and investment and portfolio analysis. Topics include time value of money, capital budgeting, capital structure, dividend policy, portfolio theory, CAPM, and market efficiency. Cross-listed with ECON 134.

BSAD 135A. Corporate Finance: Theory and Cases I. (4) Lecture, three hours; extra reading, one hour; term paper, two hours. Prerequisite(s): BSAD 134A/ ECON 134. The course is the first part of intermediate corporate finance. It covers the optimal corporate financial decisions, including capital budgeting, capital structure decisions and dividend policy. Cases as well as theory will be used to study these topics.

BSAD 135B. Corporate Finance: Theory and Cases II. (4) Lecture, three hours; extra reading, one hour; term paper, two hours. Prerequisite(s): BSAD 135A. The course is the second part of intermediate corporate financial management. It covers the analysis of different financing instruments, including lease financing, the application of option pricing theory, risks of financial planning, working capital management, and mergers and acquisitions. Cases as well as theory will be used to study these topics.

BSAD 136. Investments: Security Analysis and Portfolio Management. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 134/ECON 134. Examines the determination of investment policies and procedures of security analysis with reference to risk and return. Emphasis on the stock market.

BSAD 137. Investments: Speculative Markets. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 136. Analysis of advanced topics in finance, including options, commodity futures, financial futures, and mutual fund performance evaluation.

BSAD 138. International Finance. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 134/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.

BSAD 143. Judgment and Decision Making. (4) Lecture, three hours; written work and group presentation, three hours. Prerequisite(s): senior standing. Focuses on decision making. Topics include 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.

BSAD 144. Negotiation Fundamentals. (4) Lecture, three hours; outside projects, three 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.

BSAD 152. Economics of Labor Relations. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 002, ECON 003. An analysis of the history of labor and industrial relations in the U.S. with emphasis on problems of collective action, long-run effects of economic growth, income inequality, and the role of government. Cross-listed with ECON 152.

BSAD 153. Labor Economics. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102A. An analysis of labor demand, labor supply, and the structure of wages. Neoclassical, institutional, and radical perspectives emphasized. Cross-listed with ECON 153.

BSAD 154A. Business Law. (4) Lecture, three hours; extra reading and project, three hours. Prerequisite(s): upper-division standing or consent of instructor. Law studied 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.

BSAD 154B. International Business Law. (4) Lecture, three hours; outside research project, three hours. Prerequisite(s): BSAD 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 compu-
BSAD 155. Managing Human Resources. (4) Lecture, three hours: extra reading and project, three hours. Prerequisite(s): BSAD 020B or equivalent. Upper-division standing. Details of personnel management, emphasis on the role of human resources in management. Includes processes of forecasting and job analysis, environmental scanning, recruitment and selection, evaluation and compensation, and dispute resolution.

BSAD 156. Leadership Development. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): BSAD 020B or equivalent. Upper-division standing. Details of leadership theory and practice through lectures, self-analysis instruments, and discussions of independent field experiences. A survey of areas pertaining to leadership, such as leadership theory, leadership style, oral and written communication, ethical leadership, interpersonal conflict management, the dynamics of culture, and gender in organization leadership.

BSAD 157. Managing Work Force Diversity. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): BSAD 020B or equivalent. Upper-division standing. Details of leadership theory and practice through lectures, self-analysis instruments, and discussions of independent field experiences. A survey of areas pertaining to leadership, such as leadership theory, leadership style, oral and written communication, ethical leadership, interpersonal conflict management, the dynamics of culture, and gender in organization leadership.

BSAD 158. Accounting for Nonprofit Entities. (4) Lecture, three hours; case problems, three hours. Prerequisite(s): BSAD 020B or equivalent. Upper-division standing. Details of accounting for nonprofit institutions. Focuses on accounting for state and local governments, hospitals, schools, nonprofit health and welfare organizations, and colleges and universities.

BSAD 160. Industrial Organization. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102A. A study of the organization and structure of the American industrial system with emphasis on its profitability and variance analysis, as well as budgeting. Emphasis on production economics and cost analysis. Cross-listed with ECON 178.

BSAD 161. Business in Society. (4) Lecture, three hours; extra reading and projects, three hours. Prerequisite(s): BSAD 160. 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.

BSAD 162. Managerial Economics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 003, ECON 102A recommended. Applications of economic analysis to problems of management, especially of capital. Emphasis on production economics and cost analysis. Cross-listed with ECON 162.

BSAD 163. Cost and Management Accounting. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BSAD 020B 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 cost, standard costing and variance analysis, as well as budgets in Europe, Asia, and Latin America. Focuses on accounting issues of particular relevance to multinational corporations.

BSAD 165A. Intermediate Financial Accounting I. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): BSAD 020B 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.

BSAD 165B. Intermediate Financial Accounting II. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): BSAD 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 long-term investments.

BSAD 165C. Intermediate Financial Accounting III. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): BSAD 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 and reporting practices promulgated by practitioners in industry and public accountants.

BSAD 166. Accounting Information Systems. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 163 and BSAD 170 or their equivalent. Study of the role of the computer in the design and implementation of accounting information systems within companies’ operating environments. The emphasis will be on the effects of the computer on these systems.

BSAD 167. Advanced Financial Accounting. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): BSAD 165C (may be taken concurrently). Covers advanced accounting topics such as consolidated financial statements, accounting for multinational corporations, partnerships, accounting, and accounting for nonprofit organizations.

BSAD 168A. Individual Taxation. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 169A and BSAD 170 or their 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.

BSAD 168B. Federal Taxation for Corporations, Partnerships, Estates and Trusts. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): BSAD 168A. Reviews corporate taxation, partnerships taxation, the wealth transfer taxes, income taxation of estates and trusts, international taxation, and tax administration.

BSAD 169A. Auditing. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): BSAD 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.

BSAD 169B. Quality Assurance in Auditing. (4) Lecture, three hours; case analyses, three hours. Prerequisite(s): BSAD 169A. Examines 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.

BSAD 170. Introduction to Management of Information Systems. (4) Lecture, three hours; discussion, one 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.

BSAD 171. Systems Analysis and Design. (4) Lecture, three hours: outside readings and projects, three hours. Prerequisite(s): BSAD 170 or equivalent. Detailed analysis, specification, design, and implementation of computer-based information systems. Includes economic analyses, evaluation of alternatives, analysis/design tools, and systems project management and planning. Case studies are used.

BSAD 172. Information Economics. (4) Lecture, three hours; assigned cases and project, three hours. Prerequisite(s): BSAD 110, ECON 063 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.

BSAD 173. Introduction to Databases for Management. (4) Lecture, three hours; outside readings and projects, three hours. Prerequisite(s): BSAD 170 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.

BSAD 174. Electronic Commerce. (4) Lecture, three hours; extra reading and project, three hours. Prerequisite(s): BSAD 170. 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.

BSAD 175. Business Data Communications. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): BSAD 170. 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.

BSAD 176. The Sociology of Work in Organizations. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): SOC 001 or consent of instructor. Examines 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.

BSAD 177. Strategies in Information Systems. (4) Lecture, three hours: term project, three hours. Prerequisite(s): BSAD 170. Reviews techniques and methodologies for strategic planning and management. Explores how corporate or strategic planning must be revisited 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.

BSAD 178. International Trade. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 003. A study of the pure theory of trade; trade policy, and international factor movements including illustrative application to current issues and problems. Cross-listed with ECON 178.

BSAD 179. Business Information Systems Development. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BSAD 170. Introduces concepts and
programming techniques for building successful interactive business systems. Students use systems development tools to study event-driven programs with graphical user interfaces.

BSAD 184. Management Strategy and Policy. (4) Lecture, three hours; discussion, one 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.

BSAD 185. International Strategy and Management. (4) Lecture, three hours; outside project, three hours. Prerequisite(s): senior standing; BSAD 184 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.

BSAD 190. Special Studies. (1-5) Individual study, three to fifteen 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.

BSAD 198-I. Individual Internship in Business Administration. (1-12) Seminar, one hour; internship, three to thirty-six hours; term paper, one to eleven 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. Course is repeatable to a maximum of 16 units. A maximum of 4 quarter units may be counted toward the degree requirements for Business Administration.

BSAD 199H. Senior Honors Research. (1-5) Seminar, one hour; extra reading, two to twelve hours; term paper, two to twelve hours. Prerequisite(s): senior standing with major in Business Administration; admission to the University Honors Program or consent of instructor. Research in business administration under faculty supervision. The student will submit a written report. Total credit may not exceed 12 quarter units.

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 Biological Sciences with a specialization 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.

UPPER-DIVISION COURSES

CBNS 101. Fundamentals of Cell Biology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 011C, MATH 009B or MATH 011B, PHYS 002C, PHYS 012C, BCH 100 or BCH 110A (BCH 100 or BCH 110A may be taken concurrently). Introduces the principles of eukaryotic cell biology. Includes 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, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, 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 sexual behavior; biorehythms, learning, memory, and psychoses.

CBNS 116. Cellular Neuroscience: Structure-Function Relationships. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CBNS 106 or consent of instructor. Examination of structures comprising nervous systems and the functional principles around which these structures are organized. Topics range from whole brain anatomy to the cellular units (neurons and glia) that constitute nervous systems, and to subcellular elements important in neural functioning.

CBNS 120. Cellular Neuroscience: Membrane and Synaptic Phenomena. (4) Lecture, three hours; discussion, one 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, one hour; laboratory, three hours. Prerequisite(s): CBNS 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.

CBNS 121. Developmental Neuroscience. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CBNS 106 or consent of instructor. A study of the development of nervous systems and 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.

CBNS 124. Systems Neuroscience. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CBNS 106 or consent of instructor. Study of the structure and function of motor, sensory, and motivational systems in vertebrate and invertebrate nervous systems. Cross-listed with PSYC 124.

CBNS 125. Neuropsychopharmacology. (4) Lecture, three hours; discussion, one 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. Neurobiology of Learning and Memory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CBNS 120/PSYC 120 or consent of instructor. Covers recent research advances in the understanding of the physiological, anatomical, and biochemical basis of information acquisition and retention in nonhuman and human brain. Cross-listed with PSYC 126.

CBNS 127. Behavioral Control Systems. (4) Lecture, three hours; discussion, one hour. Prerequi-
CROSS-LISTED WITH BIOL 128.

The origin, development, and treatment of cancer are covered. Topics such as oncogenes, tumor suppressors, cell cycle differentiation, AIDS, and hereditary and environmental factors in the development of cancer are covered. Cross-listed with BIOL 128.

CBNS 150. Cancer Biology. (4) Lecture; three hours; discussion; one hour. Prerequisite(s): BIOL 107A or BIOL 107B. CBNS 101 is recommended (may be taken concurrently). The origin, development, and treatment of cancer are explored. The course focuses on molecular mechanisms responsible for cancer progression, as well as the role of environmental factors and genetic predisposition. Topics include the genetic basis of cancer, the role of the immune system in cancer surveillance, and the therapeutic strategies used to treat cancer.

CBNS 169. Human Embryology. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, or BIOL 005D. CBNS 005 or BIOL 005D is recommended. This course provides an in-depth study of normal human development from conception through the early postnatal period. It covers the mechanisms of fertilization, early development, and the processes of organ formation. Demonstrations use microscopic and other materials specifically adapted for the course. Some consideration is given to abnormal development.

CBNS 191. Seminar in Neuroscience. (3) Seminar; three hours. Prerequisite(s): CBNS 120/PSYC 120 and one or two additional courses among cell, molecular, or developmental biology. Consent of instructor is required. The seminar focuses on current research in neuroscience and the topic varies. Written assignments are required. Course is repeatable to a maximum of 6 units.

CBNS 194. Independent Reading (1-2) Individual study, three to six 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, three to twelve hours. Prerequisite(s): CBNS 120/PSYC 120 (or concurrent enrollment). Consent of instructor. An introduction to laboratory research under the supervision of a faculty member. Course is repeatable.

CBNS 199. Senior Research. (1-4) Outside research, three to twelve hours. Prerequisite(s): open to seniors by invitation of faculty. Course is repeatable.

Subject abbreviation: CMDB

Cell, Molecular, and Developmental Biology

Prudence Talbot, Ph.D., Chair
Graduate Program, 1151 Batchelor Hall
(800) 735-0717 or (909) 787-5913
www.cell.ucr.edu

Professors

Michael Adams, Ph.D.
(Cell Biology and Neuroscience/Entomology)

John Ashe, Ph.D.
(Cell Biology and Neuroscience/Psychology)

Julia Bailey-Serres, Ph.D.
(Botany and Plant Sciences)

James Baldwin, Ph.D. (Nematology)

Nancy Berke, Ph.D.
(Entomology/Cell Biology and Neuroscience)

Richard Cardullo, Ph.D. (Biology)

Darleen DeMason, Ph.D.

David Edmondson, Ph.D.

Brian Federici, Ph.D. (Entomology)

Dennis Focht, Ph.D. (Plant Pathology)

Daniel Galie, Ph.D. (Biochemistry)

M. Ellis, Ph.D.

Glenn Hatton, Ph.D.

Helen Henry, Ph.D. (Biochemistry)

Anthony H.C. Huang, Ph.D.

Richard Luben, Ph.D. (Biomedical Sciences)

Thomas Miller, Ph.D. (Entomology)

Anthony Norman, Ph.D.

Eugene Nothnagel, Ph.D.

Gladis Owen-Schaub, Ph.D.

Douglas Ethell, Ph.D. (Biomedical Sciences)

Iryna Ethell, Ph.D. (Biomedical Sciences)

Ivyon Kaloshian, Ph.D. (Nematology)

Paul Larsen, Ph.D. (Biochemistry)

Sally C. Lillard, Ph.D. (Chemistry)

Xuan Liu, Ph.D. (Biochemistry)

Ernest Martinez, Ph.D. (Biochemistry)

Dmitri Maslov, Ph.D. (Biological Sciences)

Constance Ingram, Ph.D. (Cell Biology and Neuroscience)

Mihrizi Ozkan, Ph.D. (Electrical Engineering/Chemical and Environmental Engineering)

Vladimir Parpura, M.D., Ph.D. (Cell Biology and Neuroscience)

A.L.N. Rao, Ph.D. (Plant Pathology)

Patricia S. Springer, Ph.D. (Botany and Plant Sciences)

Willie James Swanson, Ph.D. (Biochemistry)

John P. Vogel, Ph.D. (Plant Pathology)

Stephan Wilmens, Ph.D. (Biochemistry)

Zhenbiao Yang, Ph.D. (Botany and Plant Sciences)

The Cell, Molecular, and Developmental Biology Graduate Program is an interdisciplinary 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 span biological 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. 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 need to rectify undergraduate deficiencies early in the first two years of residence.

Associate Professors

Peter W. Atkinson, Ph.D. (Entomology)

Elizabeth Bray, Ph.D. (Botany and Plant Sciences)

Margaretta Currais-Gallazo, Ph.D.

(Chemistry and Neuroscience)

Scott N. Currie, Ph.D.

(Cell Biology and Neuroscience)

Howard Judelson, Ph.D. (Plant Pathology)

Christian Iyer, Ph.D. (Biomedical Sciences)

Manuela Martins-Green, Ph.D.

(Cell Biology and Neuroscience)

Frances Sladek, Ph.D.

(Cell Biology and Neuroscience)

Assistant Professors

Jeffrey B. Bachant, Ph.D. (Cell Biology and Neuroscience)

Katherine Borkovich, Ph.D. (Plant Pathology)

Kathryn Debra, Ph.D. (Biomedical Sciences)

Shou-Wei Ding, Ph.D. (Plant Pathology)

Douglas Ethell, Ph.D. (Biomedical Sciences)

Iryna Ethell, Ph.D. (Biomedical Sciences)

Ivyon Kaloshian, Ph.D. (Nematology)

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John P. Vogel, Ph.D. (Plant Pathology)

Stephan Wilmens, Ph.D. (Biochemistry)

Zhenbiao Yang, Ph.D. (Botany and Plant Sciences)
Applicants must submit GRE General Test scores (verbal, quantitative and analytical).

**GRADUATE PROGRAM**

The program offers an M.S. degree, Plan I (Thesis), and a Ph.D. degree. Students enrolled in either degree program are expected to complete the following core of course work in cell, molecular, and developmental biology:

1. One graduate-level course in cell biology (BIOL 200/CMDB 200, BPSG 237, or NRSC 200A/PSYC 200A)
2. One graduate-level course in molecular biology (BIOL 201/CMDB 201, BCH 211, BPSG 231/BCH 231, BMSC 202, or NRSC 208B/PSYC 208B)
3. One graduate-level course in developmental biology (BIOL 222, BPSG 232/BIOI 232, or ENTM 226)

Each student enrolls in the interdepartmental colloquium series in Cell, Molecular, and Developmental Biology (CMDB 257). 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**

Master’s students complete core course work in cell, molecular, and developmental biology; enroll in at least one graduate seminar course in a specialized area in one of these fields; enroll in the interdepartmental colloquium series in Cell, Molecular, and Developmental Biology; and undertake a research project leading to a thesis. Each student must complete 36 units of course work, which of at least 24 units must be in the graduate series (200 level) in the biological sciences. No more than 12 units in the 290 series can be taken to fulfill the 24-unit requirement. Candidates for the M.S. degree must defend their thesis at a public oral presentation.

**Doctoral Degree**

Students enroll in one graduate course in cell, molecular, and developmental biology, in addition to the three core courses indicated in the description for the graduate program. Students enroll in graduate seminar courses in at least two areas among cell, molecular, or developmental biology and in the interdepartmental colloquium series in Cell, Molecular, and Developmental Biology. Each candidate undertakes a research project leading to a dissertation, and fulfills a two-quarter teaching requirement. Thirty-six units of 100- or 200-series courses must be taken, of which at least 24 units must be in the graduate series (200 level) in the biological sciences. A minimum of 16 units of course work not in the 290 series must be completed to fulfill the requirements for 24 units of graduate course work. 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. Ph.D. candidates must successfully defend their dissertation research in a public oral presentation.

**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 M.S.** Two years

**Normative Time to Ph.D.** Five years

### GRADUATE COURSES

**CMDB 200. Cell Biology. (4)** Lecture, three hours; seminar, one hour. Prerequisite(s): BCH 110A or BCH 110B or equivalent (may be taken concurrently); BIOL 102 or equivalent; BIOL 113 or BIOL 114 or CRNS 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 BIOI 200.

**CMDB 201. Molecular Biology. (4)** Lecture, three hours; seminar, one 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 BIOI 201.

**CMDB 202. Developmental Biology. (4)** Lecture, three hours; discussion, one hour. Prerequisite(s): CRNS 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 250. Special Topics in Cell, Molecular, and Developmental Biology. (1-2)** Seminar, one to two 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 257. Seminar in Cell, Molecular, and Developmental Biology. (1)** Seminar, one hour. Prerequisite(s): graduate standing. Lectures by visiting scholars on current research in cell, molecular, and developmental biology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CMDB 258. Graduate Student Seminar in Cell, Molecular, and Developmental Biology. (1)** One one-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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**CMDB 281 (E-Z). Seminar in Cell Development, Structure, and Function. (2)** Seminar, two 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 BIOI 201.

**CMDB 290. Directed Studies. (1-4)** Individual study, three to eighteen 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, six to twelve 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 299. Research for the Thesis or Dissertation. (1-12)** Outside research, three to thirty-six 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, one 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).

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**CHEMICAL AND ENVIRONMENTAL ENGINEERING**

Subject abbreviations: CEE, CHE, and ENVE

Ashok Mulchandani, Ph.D., Chair
Department Office, A242 Bourns Hall
(909) 787-2423; engucr.edu/chemical

**Professors**

Robert Haddon, Ph.D. (Chemistry/Chemical and Environmental Engineering)
Mark R. Matsumoto, Ph.D.
Ashok K. Mulchandani, Ph.D.
Joseph M. Norbeck, Ph.D.

**Associate Professors**

Wilfred Chen, Ph.D.
Marc Deshusses, Ph.D.

**Assistant Professors**

David R. Cocker, Ph.D.
Eric M.V. Hock, Ph.D.
Mihr Ozkan, Ph.D. (Electrical Engineering/Chemical and Environmental Engineering)
Anders O. Wistrom, Ph.D.
Jianzhong Wu, Ph.D.
Yushan Yan, Ph.D.

Adjunct Professor
James Lents, Ph.D.

Cooperating Faculty
Christopher Amrhein, Ph.D. (Environmental Sciences)
Michael A. Anderson, Ph.D. (Environmental Sciences)
Janet T. Arey, Ph.D. (Environmental Sciences)
Matthew J. Barth, Ph.D. (Electrical Engineering)
Andrew Chia-Shing Chang, Ph.D. (Environmental Sciences)
David M. Crohn, Ph.D. (Environmental Sciences)
David E. Crowley, Ph.D. (Environmental Sciences)
William T. Frankenberger, Jr., Ph.D. (Environmental Sciences)
William A. Jury, Ph.D. (Environmental Sciences)
Thomas Meixner, Ph.D. (Environmental Sciences)
John Y.-J. Shyu, Ph.D. (Biomedical Sciences)
Asuka Venkatram, Ph.D. (Mechanical Engineering)
Marylyn V. Yates, Ph.D. (Environmental 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 engr.ucr.edu/chemical.

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, and nuclear and electronic industries. At UCR, the B.S. degree in Chemical Engineering offers students the option of focusing on biochemical processes in the Biochemical Engineering option or emphasizing traditional chemical engineering issues in the Chemical Engineering option. The goals of the major are to instill graduates with principles that will enable them to analyze and solve a wide range of problems and situations facing chemical engineers today and in the future, to provide students with the skills necessary to meet the challenges of modern engineering practice, and to provide a high-quality undergraduate education necessary for a student to advance to the M.S. and Ph.D. degree level. The Chemical Engineering 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, and hazardous waste management. At UCR, the B.S. degree in Environmental Engineering allows students to concentrate on air and/or water quality. The goals of the major are to instill graduates with principles that will enable them to analyze and solve a wide range of problems and situations facing environmental engineers today and in the future, to provide students with the skills necessary to meet the challenges of modern engineering practice, and to provide a high-quality undergraduate education necessary for a student to advance to the M.S. and Ph.D. degree level. The Environmental Engineering 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.

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. See engr.ucr.edu/studentaffairs/registration.htm for details.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, The Marlan and Rosemary Bourns College of Engineering, in the Undergraduate Studies section, for requirements that students must satisfy.

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 051A
2. CHEM 001A, CHEM 001B, CHEM 001C
3. MATH 009A

Major Requirements

Chemical Engineering

Students must choose either a Biochemical Engineering or a Chemical Engineering option.

1. Lower-division requirements (61 units)
   a) BIOL 005A, BIOL 051A
   b) CEE 010
   c) CHEM 001A, CHEM 001B, CHEM 001C
   d) CS 010
   e) MATH 009A, MATH 009B, MATH 009C,
      MATH 010A, MATH 010B, MATH 046
   f) PHYS 040A, PHYS 040B, PHYS 040C

2. Upper-division requirements (71 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 (18 units)
      (1) BCH 110A
      (2) BIOL 121A/MCBL 121A
      (3) CHE 124, CHE 124L
      (4) Four (4) units of technical electives chosen from CEE 132, CEE 135, CHE 140, CHE 150,
      CHE 171, ENVE 121
   b) Chemical Engineering option (16 units)
      (1) 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

Sample Program — Chemical Engineering

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Biochemical Engineering Option

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Chemical Engineering Option

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<td>Total Units</td>
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Environmental Engineering

Students must choose either an Air Pollution Control Technology or a Water Pollution Control Technology option.

1. Lower-division requirements (65 units)
   - a) BIOL 005A, BIOL 051A
   - b) CEE 010
   - c) CHEM 001A, CHEM 001B, CHEM 001C
   - d) CS 010
   - e) 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 (74 units)
   - a) CEE 158
   - b) CHEM 112A, CHEM 112B
   - c) CHE 100, CHE 114, CHE 120
   - d) ENGR 118
   - e) ENSC 100, ENSC 100L
   - 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/ENVT 135, ENV 14A/ENSC 14, ENV 138, ENV 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, ENVE 140
     (3) Choose one from CEE 132, ENSC 155, ENVE 144/ENSC 14, ENV 145

Sample Program — Environmental Engineering

<table>
<thead>
<tr>
<th>Fresmen Year</th>
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<td>Technical Electives</td>
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<td>Humanities/Social Sciences</td>
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<td>CHE 120, ENV 135, ENV 160B, ENV 160C, ENV 175A, ENV 175B</td>
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<td>Technical Electives</td>
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<tr>
<td>Total Units</td>
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GRADUATE PROGRAM

The Graduate Program in Chemical and Environmental Engineering offers training leading to the degrees of M.S. and Ph.D. Fields of specialization include biochemical engineering, environmental biotechnology, air quality systems engineering, and water quality systems engineering.

Admission

Applicants to the graduate program should have a degree in engineering, 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 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 are required to complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550.

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. students must participate in the core course program. Ph.D. students are required to take the core courses if they have not been completed elsewhere.

Competency in these areas will be tested as part of the comprehensive exam for M.S. students and in the written qualifying 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. engineering degree must demonstrate competency in these areas at the undergraduate level or by taking a comprehensive exam. The required courses are CHE 100, ENV 171, CHE 114, CHE 116, CHE 120, CHE 130, and ENGR 118.

Master's Degree

The M.S. degree in Chemical and Environmental Engineering can be earned by completing a thesis (Plan I), which reports an original investigation of a defined problem, or by passing a comprehensive examination (Plan II).

Plan I (Thesis) requires completion of a minimum of 36 units of approved course work and submission of an acceptable M.S. thesis. At least 24 of these units must be in graduate courses (200 series courses). The other 12 units may be in 100- or 200-level course work. No more than 4 units of CEE 290 or CEE 297 and 6 units of CEE 286 or CEE 250 may apply towards the 36 units.
Plan II (Comprehensive Examination) requires completion of a minimum of 36 units of approved course work 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 290, 297, or 299. 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 University of California 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 with the concurrence of the graduate advisor. 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, who is from off-campus, or who is 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 Ph.D. degree provides an opportunity for students to pursue a program of in-depth research in a specialized area. The procedure for satisfying the requirements for the Ph.D. degree in Chemical and Environmental Engineering at UCR consists of four parts:

1. Successful completion of an approved program of course work
2. Passing a written qualifying examination
3. Approval of a dissertation proposal
4. Defense and approval of the dissertation

Thesis Committee 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. Twenty-four units of regular lecture graduate courses in the major area and
2. Eight units of graduate and/or upper-division work approved by the advisory committee

None of these credits may be in courses numbered CEE 250, CEE 290, CEE 297, or CEE 299.

Written Preliminary Examination The purpose of the required written preliminary examination is to test students’ understanding of basic scientific and engineering principles and their application to their research interests. Each student desiring the Ph.D. degree must take this examination. Students must complete the examination near the end of their first year in the program. The examination consists of an eight-hour written comprehensive examination with a selection of problems designed to test understanding of basic concepts and principles. On the basis of the results of the preliminary examination, the examination committee (consisting of all faculty) recommends that the student be allowed to prepare a dissertation proposal, granted a second and final attempt at one or more parts of the examination, or requested to withdraw from the program.

Teaching Requirement All students must be employed as teaching assistants for at least three quarters during their graduate careers. All TAs must take CEE 302 (Teaching Practice) 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.

Qualifying Examination The student and advisor nominate the qualifying committee with the concurrence of the department chair or graduate advisor. 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 qualifying committee chair schedules an oral defense normally within one month of the written proposal submission. 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 Research Following advancement to candidacy, students formally begin 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 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 completion of the dissertation research, a written copy of the dissertation must be submitted to and approved for defense by the student’s dissertation committee. Once a draft has been approved for defense, 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.

For the Ph.D. degree, students must complete at least six quarters in residence in the University of California 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 UC M.S. degree in Chemical and Environmental Engineering (five years for those without an M.S. degree in Chemical and Environmental Engineering)

### CHEMICAL ENGINEERING

#### CHEMICAL ENGINEERING

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<thead>
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<th>Course</th>
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<td>CHE 100.</td>
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<tr>
<td>CHE 110A.</td>
<td>Chemical Process Analysis.</td>
<td>(3)</td>
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<tr>
<td>CHE 110B.</td>
<td>Chemical Process Analysis.</td>
<td>(3)</td>
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<tr>
<td>CHE 116.</td>
<td>Heat Transfer.</td>
<td>(4)</td>
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<td>CHE 117.</td>
<td>Separation Processes.</td>
<td>(4)</td>
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<tr>
<td>CHE 118.</td>
<td>Process Dynamics and Control.</td>
<td>(4)</td>
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<tr>
<td>CHE 120.</td>
<td>Mass Transfer.</td>
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### UPPER-DIVISION COURSES

#### CHEM 100.
Engineering Thermodynamics. (4) Lecture, three hours; discussion, one 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 equilibriums, temperature, and reversibility; the first 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, ENGR 100, or ME 110A.

#### CHEM 102.
Catalytic Reaction Engineering. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 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.

#### CHEM 110A.
Chemical Process Analysis. (3) Lecture, two hours; discussion, one 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.

#### CHEM 110B.
Chemical Process Analysis. (3) Lecture, two hours; discussion, one hour. Prerequisite(s): CHEM 110A 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, and combined mass and energy balances in industrial processes.

#### CHEM 114.
Applied Fluid Mechanics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 010B, ME 010; or consent of instructor. An introduction to fluid statics, fluid flow, flow of compressible and incompressible fluids in conduits and open-channel flow, flow past immersed bodies, transportation and metering of fluids, and agitator and mixing of liquids. Credit is awarded for only one of CHE 114, ENGR 115, or ME 115A.

#### CHEM 116.
Heat Transfer. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 112A, MATH 009B. Focuses on 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.

#### CHEM 136.
Advanced Topics in Heat Transfer. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 110A, MATH 112A, CHEM 118; or consent of instructor. Introduction to analysis of mass transfer in systems of interest to chemical and environmental engineering majors. Topics include design and operation of absorption and desorption systems, biologically mediated reactions, oxygen transfer coefficients, and pollution control of bioreactor design and bioseparations.

#### CHEM 140.
Cell Engineering. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CHEM 124 or consent of instructor. Introduction to genetic and environmental manipulation of cells for production of proteins and for enhanced biocatalytic and biosynthetic activities. Cloning and gene expression in different host systems, posttranslational processing, metabolic controls and kinetics, in vivo NMR spectroscopy, cell modeling, and sensitivity analysis.

#### CHEM 150.
A. Biosensors. (4) Lecture, two hours; laboratory, six hours. Prerequisite(s): CHEM 183 or CHEM 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 biotechnology.

#### CHEM 160A.
A. Chemical and Environmental Engineering Laboratory. (2) Laboratory, six hours. Prerequisite(s): CHEM 114, CHEM 120; or consent of instructor. Laboratory exercises in chemical and environmental engineering. Experiments in physical measurements, fluid mechanics, and mass transfer. Experimental design, analysis of results, and preparation of engineering reports are emphasized. Cross-listed with ENVE 160A.

#### CHEM 160B.
A. Chemical Engineering Laboratory. (2) Laboratory, six hours. Prerequisite(s): CHEM 116, CHEM 122; or consent of instructor. Laboratory exercises in chemical engineering. Experiments in physical measurements, heat
transfer, reactor analysis, and chemical kinetics. Experimental design, analysis of results, and preparation of engineering reports are emphasized.

CHE 160C. Chemical Engineering Laboratory. (2) Laboratory, six hours. Prerequisite(s): CHE 117, CHE 118, CHE 122; or consent of instructor. 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 171. Pollution Control for Chemical Engineers. (4) Lecture, three hours; laboratory, three 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, one hour; laboratory, six hours; consultation, one hour. Prerequisite(s): 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. Concentrates mainly 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, one hour; laboratory, six hours; consultation, one 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 projects begun in CHE 175A. A final report and oral presentation are required.

CHE 190. Special Studies. (1-5) Individual study, three to fifteen 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, three hours; discussion, one hour. Prerequisite(s): ENVE 133, ENVE 142; or consent of instructor. Fundamentals of physicochemical unit processes used in environmental engineering. Coagulation and flocculation, sedimentation, filtration, adsorption, redox processes, and heat and mass transfer processes.

ENVE 121. Biological Unit Processes. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ENVE 120, ENVE 142; or consent of instructor. An introduction to the theory and design of biological unit processes used in environmental engineering. Spent growth processes, attached growth processes, digestion processes, and nutrient removal systems are covered.

ENVE 130. Advanced Engineering Thermodynamics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHE 100, MATH 010B (MATH 010B may be taken concurrently); or consent of instructor. Advanced study of chemical thermodynamics and their applications to chemical and environmental engineering processes. Principles for the thermodynamic behavior of pure solutions and mixtures, phases, and chemical equilibria for homogeneous and heterogeneous systems are applied to a variety of chemical processes and environmental engineering. Cross-listed with CHE 130.

ENVE 133. Fundamentals of Air Pollution Engineering. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHE 114, CHEM 112B, ENVE 171; or consent of instructor. Principles, modeling, and design of systems for atmospheric emission control of pollutants such as photochemical smog and by-products of combustion. Effects of air pollution on health.

ENVE 134. Technology of Air Pollution Control. (4) Lecture, four 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, three hours; discussion, one hour. Prerequisite(s): CHEM 112B, ENVE 120; or consent of instructor. Fate and transport of contaminants in the air, water, and soil environments. Description and modeling of advection, dispersion, phase transfer, and chemical transformation of contaminants.

ENVE 138. Combustion Engineering. (4) Lecture, four hours. Prerequisite(s): ENGR 115, ENVE 153. 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 140. Aquatic Chemistry. (4) Lecture, three hours; one-hour discussion and three-hour laboratory. Alternate weekly. Prerequisite(s): CHEM 110A or ENGR 100; ENVE 142; or consent of instructor. An introduction to the chemical principles and equilibrium models which are used to describe the behavior of natural water systems, water and wastewater treatment processes, and pollutant transformations which occur in the aqueous environment. Topics and laboratory exercises include acid-base chemistry, precipitation, and redox reactions.

ENVE 142. Water Quality Engineering. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHE 114, ENVE 171; or consent of instructor. An introduction to the engineering aspects of water quality management. Water quality characterization and modeling techniques for natural and engineered systems. Application of chemical equilibrium and kinetic models to water quality is discussed.

ENVE 144. Solid Waste Management. (4) Lecture three hours; discussion, one hour. Prerequisite(s): either BIOL 002 or both BIOL 005A and BIOL 05LA; CHEM 001C (or CHEM 010H); or both ENSC 001 (or ENSC 010H) and ENSC 002 (or ENSC 010H); or ENVE 171; MATH 009B (or MATH 09B); 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 processes for recovering or disposing solid waste while protecting public and environmental well-being. Cross-listed with ENSC 144.

ENVE 145. Hazardous Waste Management. (4) Lecture, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): CHE 114, ENVE 142 (ENVE 142 may be taken concurrently); or consent of instructor. An introduction to methods of analysis and hydraulic design of water quality systems. Application of the basic theories of fluid flow to the design of water distribution networks, wastewater and storm water collection systems, structures for flow measurement and control, and pumps and pump stations. Emphasis is given to design projects aimed at developing design process skills, including problem specification, modeling, and analysis.

ENVE 160A. Chemical and Environmental Engineering Laboratory. (2) Laboratory, six hours. Prerequisite(s): CHE 114, CHE 116; or consent of instructor. Laboratory exercises in chemical and environmental engineering. Experiments in physical measurements, fluid mechanics, and mass transfer. Experimental design, analysis of results, and preparation of engineering reports are emphasized. Cross-listed with CHE 160A.

ENVE 160B. Environmental Engineering Laboratory. (2) Laboratory, six hours. Prerequisite(s): CHE 116, ENVE 133; or consent of instructor. Consists of laboratory exercises in environmental engineering. Includes experiments in physical measurements, reaction kinetics, reaction analysis, and air pollution engineering. Emphasis is on experimental design, analysis of results, and preparation of engineering reports.

ENVE 160C. Environmental Engineering Laboratory. (2) Laboratory, six hours. Prerequisite(s): ENVE 120, ENVE 142; or consent of instructor. Laboratory exercises in environmental engineering. Experiments in physical measurements, water quality, and unit operations and processes. Experimental design, analysis of results, and preparation of engineering reports are emphasized.

ENVE 171. Introduction to Environmental Engineering. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001C, MATH 009C, PHYS 040B; or consent of instructor. Introduction to mass and energy balances. Overview of basic principles underlying contamination 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, one hour; laboratory, six hours; consultation, one 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, one hour; laboratory, six hours; consultation, one 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 is not available.

ENVE 190. Special Studies. (1-5) Individual study, three to fifteen 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, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): CHE 120, ENGR 115, ENGR 116, 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, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): CHE 150/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, three hours; laboratory, three 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, three hours; discussion, one 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, two hours; discussion, two hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Examines the 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 225. Physical and Chemical Separation Processes. (4) Lecture, four hours. Prerequisite(s): graduate standing in Chemical and Environmental Engineering or consent of instructor. Examines the 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 233. Advanced Air Pollution Control and Environmental Engineering. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHE 202, CHEM 112A, CHEM 112B, ENVE 135, 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 241. Water Quality. (4) Lecture, three hours; discussion, one 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, one hour; laboratory, nine 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 246. Surface and Interface Phenomena. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHE 100 or ENGR 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 colloidal stability.

CEE 247. Molecular Thermodynamics of Complex Fluids. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHE 200, CHEM 206, or consent of instructor. Introduction to advanced colloid and surface chemistry, Derjaguin-Landau-Verwey-Overbeek (DLVO) theory on colloid stability, colloidal hydrodynamics, and transport in porous media.

CEE 250. Special Topics in Chemical and Environmental Engineering. (1-2) Seminar, one to two hours. Prerequisite(s): graduate standing. Discusses recent developments in the field of environmental engineering such as colloids, polymers, biomacromolecules, and fluids under inhomogeneous conditions.

CEE 251. Microbial Engineering and Environmental Biotechnology. (1-2) Seminar, one to two hours. Discusses the recent development of novel biocatalysts and biological materials for degrading toxic pollutants or synthesizing environmentally friendly chemicals. Students who present a formal seminar receive a satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 252. Introduction to Microfluidics. (4) Lecture, four 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.

CEE 253. Biodegradation and Bioremediation. (1-2) Seminar, one to two 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, one to two 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.

CEE 255. Special Topics in Water Quality Engineering. (1-2) Seminar, one to two hours. Prerequisite(s): graduate standing. Presents topics of current concern in water and wastewater treatment and management. Students who present a formal seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 256. Biological and Biomedical Engineering. (1-2) Seminar, one to two hours. Prerequisite(s): graduate standing. Introduces practical introduction to microfluidics and assembly of components into systems. Emphasizes the considerations underlying the design or operation of devices based on pressure-driven or electrokinetic flow.

CEE 258. Biosensing and Biodetection. (1-2) Seminar, one to two hours. Prerequisite(s): graduate standing. Covers current research topics in water quality engineering. Students who present a formal seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 260. Stochastic Methods in Colloidal Dispersions. (1-2) Seminar, one to two 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 formal 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. (1-2) Seminar, one to two hours. Prerequisite(s): graduate standing. Covers recent developments in the field of zeolites and fuel cells. Emphasizes understanding intercolloid forces and self-assembly of colloidal particles for the fabrication of new materials. Students who present a formal 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, two hours. Prerequisite(s): graduate standing. Discusses recent developments in the field of membrane separations. Topics may include basic membrane transport theory, membrane materials and formation processes, advanced fuel cell membranes and electrode catalysts, and production of hydrogen, and synthesis and manipulation of nanomaterials. Students who present a formal seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CEE 266. Colloquium in Chemical and Environmental Engineering. (1) Colloquium, one hour. Prerequisite(s): graduate standing. Lectures on current research topics 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 280. Directed Studies. (1-6) Individual study, three to eighteen hours. Prerequisite(s): consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in chemical and environmental engineering, and other related fields presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CEE 286. Directed Studies. (1-6) Individual study, three to eighteen hours. Prerequisite(s): consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in chemical and environmental engineering, and other related fields presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

CEE 290. Directed Studies. (1-6) Individual study, three to twelve hours. Prerequisite(s): consent of instructor and graduate advisor. Individual study, directed by a faculty member, of selected topics in chemical and environmental engineering, and other related fields presented by faculty members and visiting scientists. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

CEE 297. Directed Research. (1-6) Outside research, three to eighteen 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.
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, one to twelve hours; internship, two to twenty-four 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, three to thirty-six 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, one to four 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

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Cooperating Faculty
Roger Atkinson, Ph.D. (Environmental Sciences)
Jocelyn G. Miller, Ph.D. (Entomology)
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 premedical, preprofessional, or prepharmaceutical science; education; and administration.

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 postgraduate studies in the health sciences should make it a special point to consult with the Chemistry undergraduate advisor early in their studies at UCR.

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. The latter usually requires three quarters and includes education courses and supervised teaching.

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 in which the candidate will teach. The candidate can demonstrate proficiency either by passing the commission’s subject-matter assessment examination, or preferably, by completing an undergraduate program that is state-approved for teacher preparation.

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 waiver program for the multiple subjects credential, are available in the Liberal Studies and Interdisciplinary Programs office, (909) 787-2743. Details and counseling on other waiver programs are available in the Department of Chemistry or the Graduate School of Education.

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, the Student Affairs Office (1221 Pierce Hall), and the Graduate School of Education (1124 Sproul Hall).

Career Opportunities

Most present-day chemists work in industrial firms, government, and education. Although many chemists eventually leave the research laboratory for positions in management, marketing, or production, the most common professional assignments are in research and development. Chemists are involved in the development, production, testing, control, and sales of products such as medicines, glasses, metals, agrochemicals, paints, rubber, plastics, soaps and detergents, and plant nutrients. An increasing number of chemists are involved in the fields of molecular biology, air and water quality, and the development of new sources of energy and new high-technology materials.

The federal government and nonprofit foundations also employ chemists. Such agencies as
the National Institutes of Health, Department of Energy, the Environmental Protection Agency, National Aeronautics and Space Administration, National Institutes of Science and Technology, and Food and Drug Administration require scientific and technological advice and administration as well as chemical research.

The bachelor’s degree programs in the Department of Chemistry are well suited for preparation for general, technical, professional, and health-science careers. After graduation, UCR students may be professionally employed; go on to graduate work; or enter business, medical, or other professional schools.

Transfer Students

Students transferring to the Chemistry major are required to complete courses comparable to the following one-year sequences before they transfer:

1. General chemistry, equivalent to CHEM 001A, CHEM 001B, CHEM 001C, 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. Second-year calculus, equivalent to MATH 010A, MATH 010B, MATH 046, each course completed with a grade of “C” or better
2. General physics (calculus-based) equivalent to PHYS 040A, PHYS 040B, PHYS 040C, 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.

Degree 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.

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.A. and the B.S. degree in Chemistry are as follows:

Bachelor of Arts

1. Lower-division requirements (48–49 units)
   a) MATH 009A, MATH 009B, MATH 009C, MATH 010A
   b) PHYS 040A, PHYS 040B, PHYS 040C (or PHYS 002A, PHYS 02A, PHYS 02B, PHYS 02C, PHYS 02LC)
   c) CHEM 001A, CHEM 001B, CHEM 001C (or CHEM 01HA, CHEM 01HB, CHEM 01HC), CHEM 005
2. Upper-division requirements (38 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 115, 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 (61–62 units)
   a) CHEM 001A, CHEM 001B, CHEM 001C (or CHEM 01HA, CHEM 01HB, CHEM 01HC), CHEM 005
   b) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   c) PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D
2. Upper-division requirements (50 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) Ten (10) additional upper-division units
   c) Two additional courses from the group CHEM 191, CHEM 112A, CHEM 112B, CHEM 112C, CHEM 113, CHEM 125, CHEM 150A, CHEM 191
   d) One course from CHEM 197, CHEM 199, ENSC 163, ENTX 135

2. Upper-division requirements (74 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-four (24) 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 the undergraduate advisor before electing this option.

1. Lower-division requirements (73–74 units)
   a) CHEM 001A, CHEM 001B, CHEM 001C (or CHEM 01HA, CHEM 01HB, CHEM 01HC), CHEM 005
   b) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   c) PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D
   d) BIOL 005A, BIOL 005B, BIOL 005C
2. Upper-division requirements (64–68 units)
A minimum grade of “C-” for any upper-division course used to fulfill the requirements for the Environmental Chemistry option.
   b) One course from ENSC 104/SWSC 104 or GEO 137
   c) Two additional courses from the group CHEM 150B, CHEM 197, CHEM 199, ENSC 104/SWSC 104, ENSC 140/SWSC 140, ENSC 142, ENSC 155, ENSC 163, ENTX 101, GEO 137, GEO 160 (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 contact individual faculty members concerning areas of interest.

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.
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

All students admitted to regular graduate status as prospective candidates for master’s or doctoral degrees in chemistry are required, at the beginning of their first quarter in residence, to 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 Pierce Hall for this information. Students working toward advanced degrees in chemistry 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

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)

a) 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) must be included. 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.

b) A thesis

c) A final oral examination on the thesis may be required.

Plan II (Comprehensive Examination)

a) 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.

b) Passing at least two cumulative examinations

Doctoral Degree

The requirements are orientation examinations in analytical, inorganic, organic, and physical chemistry; general university requirements; and departmental requirements.

Program of Study

A program of study will be required by the departmental committee on graduate 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)

Cumulative Examinations

To encourage a planned program of study and literature reading carried out concurrently with research, the major written examinations in each subdiscipline offered for the doctor’s degree (namely, analytical, inorganic, organic and physical chemistry) shall consist of cumulative examinations. Nine examinations are given each year, the first in September and the last in June. Students may begin the cumulative examinations at any time during their first year in residence. Once the examination program has been started, students may elect to take the examinations sequentially or skip selected examinations at their discretion. However, no student is given more than the 15 attempts to pass the six examinations needed to satisfy the requirement. In addition, the six examinations must be passed before the end of the second year in residence.

Foreign Language

A reading knowledge of German, French, or Russian is recommended but not required for the doctoral degree in chemistry.

Oral Qualifying Examination

After passing the required number of cumulative exami-
nations, the candidates are given an oral examination by their doctoral committee. 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 Assistant Experience Three quarters of service as a teaching assistant, or equivalent, are normally required.

Normative Time to Degree 15 quarters

LOWER-DIVISION COURSES

CHEM 001A. General Chemistry. (4) F,W, Summer Lecture, three hours; laboratory, three hours. Prerequisite(s): CHEM 001B or MATH 005 or a grade of “C-” or better in an equivalent course or a passing score on the California Chemistry Diagnostic Test. An introduction to the history and theory of chemistry. Credit is awarded for only one of CHEM 001A or CHEM 01HA.

CHEM 001B. General Chemistry. (4) W,S,Summer Lecture, three hours; laboratory, three hours. Prerequisite(s): CHEM 001A with a grade of “C-” or better or CHEM 01HA with a grade of “C-” or better. An introduction to the basic principles of chemistry. Credit is awarded for only one of CHEM 001B or CHEM 01HB.

CHEM 01HC. General Chemistry. (4) F,S,Summer Lecture, three hours; laboratory, three hours. Prerequisite(s): CHEM 001B with a grade of “C-” or better or CHEM 01HB with a grade of “C-” or better. An introduction to the basic principles of chemistry. Credit is awarded for only one of CHEM 01HC or CHEM 01HC.

CHEM 01HA. Honors General Chemistry. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): concurrent enrollment in or completion of MATH 009A or MATH 09HA or equivalent, a score of at least 640 on the quantitative SAT test, high school chemistry; or consent of instructor. 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 01HA and CHEM 01HA.

CHEM 01HB. Honors General Chemistry. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): concurrent enrollment in or completion of MATH 009A or MATH 09HA or equivalent, a score of at least 640 on the quantitative SAT test, high school chemistry; or consent of instructor. 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 01HB and CHEM 01HB.

CHEM 01HC. Honors General Chemistry. (4) Lecture, three hours; discussion, one hour; laboratory, three hours. Prerequisite(s): CHEM 001B with a grade of “B” or better or CHEM 01HB with a grade of “B” or better or consent of instructor. 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 01HC and CHEM 01HC.

CHEM 011W. Preparation for General Chemistry. (3) F Lecture, two hours; workshop, three hours. Prerequisite(s): concurrent enrollment in or completion of MATH 005 or MATH 005. 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.

CHEM 003. Concepts of Chemistry. (4) Lecture, three hours; discussion, one 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 005 may take CHEM 001A or CHEM 01HA for full credit.

CHEM 005. Quantitative Analysis. (5) F,Summer Lecture, three hours; laboratory, eight hours (two four-hour periods). Prerequisite(s): CHEM 001C or CHEM 01HC with a grade of “C-” or better. Stoichiometric calculations and applications of principles of chemical equilibrium to analytical problems. Titrimetric and gravimetric laboratory procedures.

CHEM 091. Freshman Seminar: What Chemists Do. (1) Seminar, one 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, medicine, and neuroscience. Graded Satisfactory (S) or No Credit (NC).

CHEM 097FH. Freshmen Honors Project: Introduction to Research. (1-4) (Outside research, three to twelve 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.

CHEM 109. Survey of Physical Chemistry. (4) F Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001C or CHEM 01HC with a grade of “C-” or better; MATH 009B with a grade of “C-” or better. 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. Not open to students with credit in CHEM 110A, CHEM 110B, and CHEM 113.

CHEM 110A. Physical Chemistry: Chemical Thermodynamics. (4) F Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A with a grade of “C-” or better (or MATH 009C with a grade of “C” or better if MATH 010A is taken concurrently), and either PHYS 002A, PHYS 002B, and PHYS 002C with grades of “C-” or better if MATH 009C is taken concurrently, or consent of instructor. Introduction to thermodynamics with applications to chemical systems.

CHEM 110B. Physical Chemistry: Introduction to Statistical Mechanics and Kinetics. (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 110A with a grade of “C-” or better or consent of instructor; prior or concurrent enrollment in PHYS 004A and PHYS 004B. Statistical mechanics, kinetic molecular theory, and chemical kinetics with applications to chemical systems.

CHEM 111. Physical Chemistry Laboratory. (4) W Lecture, two hours; laboratory, eight hours. Prerequisite(s): CHEM 110A and CHEM 110B with grades of “C-” or better (CHEM 110B may be taken concurrently), or consent of instructor. Theory and application of modern electronic and optical measurement techniques.

CHEM 112A. Organic Chemistry. (4) F,W, Summer Lecture, three hours; laboratory, four hours. Prerequisite(s): CHEM 001C with a grade of “C-” or better or CHEM 01HC 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 112B. Organic Chemistry. (4) W,S,Summer Lecture, three hours; laboratory, four 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, three hours; laboratory, four 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 113. Physical Chemistry: Introduction to Quantum Chemistry. (4) F Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001C with a grade of “C-” or better or CHEM 01HC with a grade of “C-” or better; MATH 009C with a grade of “C-” or better; MATH 046 with a grade of “C-” or better. Introduction to quantum mechanics with application to atomic and molecular structure and spectra.

CHEM 125. Instrumental Methods. (3/5) W Lecture, three hours; laboratory, eight hours. Prerequisite(s): CHEM 005 with a grade of “C-” or better; either PHYS 002A, PHYS 002B, and PHYS 002C or PHYS 040A, PHYS 040B, and PHYS 040C. (PHYS 040C may be taken concurrently) or equivalents or consent of instructor. Chromatographic separations, electrochemistry, and principles of spectroscopic techniques are presented as an introduction to instrumental methods and their use in chemistry. Graduate students charge per lecture for CHEM 125: 3 units for lecture and laboratory (5 units).

CHEM 135. Chemistry of the Clean and Polluted Atmosphere. (4) W Lecture, three hours; laboratory, eight hours. Prerequisite(s): CHEM 112A, CHEM 112B, or consent of instructor; ENSC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric N ox spheres; formation and characteristics of photochemical air pollution; modeling of air pollution and control strategies; stratospheric ozone depletion and global warming. Cross-listed with ENSC 135 and ENXT 135.

CHEM 136. Chemistry of Natural Waters. (4) S Lecture, three hours; discussion, one 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-solution, air-water exchange, and use of equilibrium and kinetic models for describing marine nutrient, trace metal, and sediment chemistry. Cross-listed with ENSC 136, ENXT 136, and SWSC 136.

CHEM 149. Environmental Chemistry Laboratory. (4) S Lecture, two hours; laboratory, eight 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
CHEM 150A. Inorganic Chemistry. (4) W Lecture, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): CHEM 150A 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 transition metal chemistry.

CHEM 166. Advanced Structural and Synthetic Methods. (2-4) S Lecture, two hours; laboratory, eight hours. Prerequisite(s): CHEM 112C with a grade of "C-" or better; CHEM 125 and CHEM 150A recommended. Methods for the characterization of organic and inorganic compounds. Advanced methods of synthesis of organic and inorganic compounds such as vacuum, inert atmosphere, high-pressure, and photochemical techniques. 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 register for lecture (2 units) or for 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, one hour. Prerequisite(s): upper-division standing; consent of instructor. An introduction to 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).

CHEM 197. Research for Undergraduates. (1-4) Outside research, three to twelve hours. Prerequisite(s): sophomore or junior standing; consent of instructor. An introduction to 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 198-199. Individual Internship. (1-9) Internship, three to twelve hours; term paper or presentation for attendance, one to four hours. Prerequisite(s): upper-division standing in chemistry or consent of instructor. Industrial work experience coordinated and supervised by a chemistry faculty member and an off-campus sponsor. A term paper or presentation is required. Course is repeatable to a maximum of 8 units.

CHEM 199. Senior Research. (1-4) Outside research, three to twelve 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 200. Honors Research. (1-5) Outside research, three to fifteen hours. Prerequisite(s): senior standing; consent of instructor; a minimum GPA of 3.00 in chemistry courses and in all university course work. Research 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.

CHEM 201A. Advanced Physical Chemistry: Quantum Mechanics. (3) Lecture, three 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 Schrödinger equation.

CHEM 201B. Advanced Physical Chemistry: Quantum Mechanics and Spectroscopy. (3) Lecture, three hours. Prerequisite(s): CHEM 115 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, three 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, three 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.

CHEM 201E. Advanced Physical Chemistry: Kinetics. (3) Lecture, three 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. Nanoscience and Nanotechnology. (3) Lecture, three hours. Prerequisite(s): graduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. Gives a condensed, interdisciplinary overview of selected fields of nanoscience and emerging nanotechnological applications. Special focus is on applications relevant for the campus research community that are not based on electronic applications of silicon.

CHEM 204. Intermediate Molecular Spectroscopy. (3) Lecture, three hours. Prerequisite(s): CHEM 113 with a grade of "C" or better. Spectroscopic applications of basic quantum chemistry, including selected topics from electronic spectroscopy of atoms and molecules; vibrational, rotational, and Raman spectroscopy; coherent and multi-photon laser spectroscopies; and time-domain spectroscopies.

CHEM 205. Chemical Quantum Mechanics. (3) Lecture, three hours. Prerequisite(s): consent of instructor. The elements of quantum mechanics with particular emphasis on chemical problems.

CHEM 206. Chemical Statistical Mechanics. (3) Lecture, three hours. Prerequisite(s): consent of instructor. The fundamentals of statistical mechanics and selected topics of current physical-chemical interest.

CHEM 207. Chemical Group Theory. (3) Lecture, three 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, three hours. Prerequisite(s): undergraduate standing in Chemistry, Physics, Engineering, or a related subject or consent of instructor. An interdisciplinary overview of the 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.

CHEM 209. Topics in Physical Chemistry. (2) Lecture, two hours (2 units) or three 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, three hours. Prerequisite(s): CHEM 112C. Covers modern organic reactions and reagents and their mechanistic pathways, with emphasis on recent developments.

CHEM 211A. Advanced Organic Chemistry. (3) Lecture, three 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, three hours. Prerequisite(s): CHEM 112C, CHEM 113. Covers structure and bonding in organic compounds, with emphasis on more advanced aspects of the field.

CHEM 215A. Organic Synthesis. (3) Lecture, three 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, three 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. (3) Lecture, three hours. Prerequisite(s): CHEM 211A, CHEM 211B, CHEM 211C. An advanced treatment of physical organic chemistry.

CHEM 216B. Physical Organic Chemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 211A, CHEM 211B, CHEM 211C. An advanced treatment of physical organic chemistry.

CHEM 219 (E-2). Advanced Topics in Organic Chemistry. (2-3) Lecture, two hours (2 units) or three hours (3 units). Prerequisite(s): consent of instructor. Selected advanced topics from modern organic chemistry. The contents of these courses will vary. Course may be repeated with different topic (and different letter).

CHEM 221A. Advanced Analytical Chemistry: Separation Science. (3) Lecture, three 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, three hours. Prerequisite(s): CHEM 125. Provides an overview of modern analytical optical spectroscopic techniques including theory, instrumentation, and applications.

CHEM 221C. Advanced Analytical Chemistry: Chemical Instrumentation. (3) Lecture, three hours. Prerequisite(s): CHEM 125. Provides an overview of modern electrochemical, including analog and digital electronics, as it pertains to the development of modern chemical instrumentation.

CHEM 221D. Advanced Analytical Chemistry: Electrochemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 125. Provides an overview of modern electronic measurements, including voltammetry and amperometry.

CHEM 221E. Advanced Analytical Chemistry: Nuclear Magnetic Resonance and Mass Spectroscopy. (3) Lecture, three hours. Prerequisite(s): CHEM 125. Provides an overview of modern analytical NMR and mass spectroscopy including basic theory, instrumentation, and applications.
CHEM 229 (E-Z). Advanced Topics in Analytical Chemistry. (2-3) Lecture, two hours (2 units) or three hours (3 units). Prerequisite(s): consent of instructor. Selected advanced topics from modern analytical chemistry. The contents of these courses will vary. Course may be repeated with different topic (and different letter).

CHEM 231A. Structure and Bonding in Inorganic Chemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 150A, CHEM 150B. Covers advanced synthesis, structure, and bonding in inorganic, coordination, and organometallic chemistry. Emphasis on the mechanism and design of enantioselective reactions. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. Bartels

CHEM 231B. Reactivity and Mechanism in Inorganic and Organometallic Chemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 231A. Covers advanced synthesis, reactivity, and mechanism in inorganic, coordination, and organometallic chemistry.

CHEM 231C. Solid State and Materials Inorganic Chemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 231A. Covers the advanced synthesis, structure, bonding, and properties of inorganic materials.

CHEM 234. Bioinorganic and Organometallic Chemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 231A. Covers the advanced chemistry of metals in biology and model compounds.

CHEM 235. Main Group Chemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 231A. Covers the synthesis, structure, reactivity, and mechanism in main group chemistry and their relationships to organic chemistry.

CHEM 236. Physical Methods in Inorganic Chemistry. (3) Lecture, three hours. Prerequisite(s): CHEM 231A. Surveys physical methods applied to inorganic chemistry including X-ray structure, infrared (IR), nuclear magnetic resonance (NMR), mass spectroscopy, electron paramagnetic resonance (EPR), Mossbauer, magnetic susceptibility, and theory.

CHEM 239 (E-Z). Advanced Topics in Inorganic Chemistry. (2-3) Lecture, two hours (2 units) or three 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 241. Bioorganic Chemistry. (3) Lecture, three hours. Prerequisite(s): BCH 100 or BCH 110A; BCH 18A or CHEM 110B; CHEM 112A, CHEM 112B, CHEM 112C; graduate standing or consent of instructor. Biochemical reactions discussed from a chemical standpoint, including reactions associated with bioenergetics, biosynthesis, and enzyme catalysis. Emphasis on reaction mechanisms. Cross-listed with BCH 211.

CHEM 244. Airborne Toxic Chemicals. (3) Lecture, three hours. Prerequisite(s): CHEM 109 or CHEM 110A; and CHEM 110B, CHEM 135/ENVS 135/ENTX 135; or consent of instructor. Atmospheric chemistry of airborne chemicals. Intermedia partitioning, Structure of the atmosphere. Gas-particle distributions of chemicals, and wet and dry deposition of gases and particles. Atmospheric reactions of organic compounds, with emphasis on toxics. Theoretical and experimental methods for determination of atmospheric lifetimes and products of chemicals. Cross-listed with ENTS 244.

CHEM 245. Chemistry and Physics of Aerosols. (3) Lecture, three 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 and environmental effects. Cross-listed with ENTS 245 and WSBS 245.

CHEM 246. Fate and Transport of Chemicals in the Environment. (4) Lecture, four hours. Prerequisite(s): CHEM 109 or CHEM 110B; CHEM 112A, CHEM 112B, CHEM 112C; or consent of instructor. Covers the identification of toxics and their sources in the environment; equilibrium partitioning of chemicals in the environment (between air, water, soil, sediment, and biota); and transport 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 ENVS 200 and ENTS 200.

CHEM 250. Graduate Seminar in Chemistry. (1 Seminar, one and a half 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, two 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. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 252. Graduate Seminar in Inorganic Chemistry. (2 Seminar, two hours. Prerequisite(s): graduate student status. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in inorganic chemistry. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 253. Graduate Seminar in Organic Chemistry. (2 Seminar, two hours. Prerequisite(s): graduate student status. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in organic chemistry. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 254. Graduate Seminar in Physical Chemistry. (2 Seminar, two 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. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 257. Environmental Chemistry Seminar. (1 Seminar, one hour. Prerequisite(s): graduate standing in Chemistry or Soil and Water Sciences. Oral presentations by visiting scholars and UCR faculty on current research topics in environmental chemistry, environmental sciences, and environmental toxicology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with WSBS 257.

CHEM 260. Analysis of Single Cells and Subcellular Organelles. (2) F,W,S Seminar, two hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the study of individual biological entities and biochemical processes at the cellular and subcellular levels. Special emphasis is placed on the use of capillary electrophoresis (separation parameters and detectors) for cellular analysis. Other topics include microscopy, cell culture, biochemical and optical, and laser microinjection, as they related to single cells and single organelles. Letter grades are assigned to students who present a seminar or submit a term paper; others are graded Satisfactory (S) or No Credit (NC) based on seminar participation. Lillard

CHEM 261. Scanning Probe Microscopy in Surface Science. (2 Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Focuses on the 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 gate and control elementary steps of surface reactions. Reviews surface crystallography, electronic, and phononic band structure. Letter grades are assigned to students who present a seminar or submit a term paper; others receive Satisfactory (S) or No Credit (NC) grades. Course is repeatable. Bartels

CHEM 262. Ultrafast Dynamics in Condensed Matter. (2) Seminar, two hours. Prerequisite(s): consent of instructor. The extremely fast relaxation and dephasing of nuclear (vibrational) and electronic excitations in condensed matter are studied by making spectroscopic measurements 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). Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Chronister

CHEM 263. Synthesis of Novel Molecules. (2) Seminar, two hours. Prerequisite(s): consent of instructor. Study of the asymmetric synthesis of novel molecules with emphasis on the mechanism and design of enantioselective reactions. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Angle

CHEM 264. Novel Synthesis in Inorganic Chemistry. (2) Seminar, two hours. Prerequisite(s): graduate standing or consent of instructor. Discusses strategies for the synthesis of novel structures in bioinorganic coordination, organometallic, and materials chemistry. Letter grades are assigned to students who present a seminar or submit a term paper; others are graded Satisfactory (S) or No Credit (NC) based on seminar participation. Course is repeatable. Reed

CHEM 265. Raman Spectroscopy of Biological Systems. (2) Seminar, two 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. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. Bocian

CHEM 266. Chemical Microsensors for In Situ Measurements. (2) Seminar, two hours. Prerequisite(s): consent of instructor. The development and characterization of novel chemical microsensors. Analytical properties such as time response selectivity and sensitivity will be investigated and optimized for use in the measurement of dynamic chemical events in situ in the mammalian brain. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. Kahr

CHEM 267. Organic Electronic Materials. (2) Seminar, two 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; others receive Satisfactory (S) or No Credit (NC) grade. Course is repeatable. Cross-listed with CEE 254. Haddon

CHEM 268. Organometallics in Organic Synthesis. (2) Seminar, two hours. Prerequisite(s): consent of instructor. Synthesis and reactions of organometallic compounds with emphasis on development of new organometallics. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Midland
CHEM 269. New Trends in Main Group Chemistry. (2) Seminar, two 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. Synthesis of Molecules of Biological and Theoretical Interest. (2) Lecture, two hours. Prerequisite(s): consent of instructor. Synthesis, reactivities, and properties of molecules of naturally occurring substances (e.g., vitamin D, retinal and related natural products) and molecules of theoretical interest (e.g., nonbenzenoid aromatics, etc.). Discussions of modern synthetic approaches, reaction mechanisms and structure-activity relationships. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Oka

CHEM 271. Design, Synthesis, and Applications of Highly Conjugated Organic Systems. (2) Seminar, two hours. Prerequisite(s): 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. Letter grades are assigned to students who present a seminar or submit a term paper; other students are graded Satisfactory (S) or No Credit (NC). Course is repeatable. Marsella

CHEM 272. Characterization of Atmospheric Aerosol Systems. (2) Seminar, two hours. Prerequisite(s): consent of instructor. Development of instrumentation for the detection of individual atmospheric aerosol particles in situ. Emphasis on characterizing the chemistry of aerosol systems as a function of size and composition. Letter grades will be assigned to students who submit a term paper or present a seminar; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

CHEM 273. Bioanalytical Nuclear Magnetic Resonance Spectroscopy. (2) Seminar, two 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. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Rabenstein

CHEM 274. Metal-Carbon Bond Synthesis. (2) Lecture, one hour; discussion, one hour. Prerequisite(s): consent of instructor. Techniques of metal-carbon bond synthesis. Reactions of metal-carbon systems. Characterization of metal-carbon systems, especially by nuclear magnetic resonance. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Rettig

CHEM 275. Bioorganic Chemistry of Nucleic Acids. (2) Seminar, two hours. Prerequisite(s): consent of instructor. The origin, group chemistry and evaluation of nucleic acids 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. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. Switzer

CHEM 276. Enantioselective Homogeneous Catalysis. (2) Seminar, two hours. Prerequisite(s): graduate standing or consent of instructor. Design and preparation of novel inorganic and organometallic compounds with applications to catalyst development, to novel catalytic processes, and to synthesis of organometallic materials. Discussions of current publications on homogene- ous catalysis and reaction mechanisms. Focus on frontiers in catalysis in the overall context of synthetic method- ologies. Letter grades are assigned to students who present a seminar or submit a term paper; other students are graded Satisfactory (S) or No Credit (NC). Hollis

CHEM 277. Surface Chemistry. (2) Seminar, two 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. Zacs

CHEM 278. Nuclear Magnetic Resonance: Theory, Techniques, and Applications. (2) Seminar, two 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. Letters grades are assigned to students who present a seminar or submit a term paper; other students are graded Satisfactory (S) or No Credit (NC) based on seminar participation. Course is repeatable. Mueller

CHEM 279. Molecular Spectroscopy. (2) Seminar, two hours. Prerequisite(s): consent of instructor. Properties of excited states of molecules. Molecular photophysics and photochemistry. Theory of radiationless tran- sitions. Kinetics and mechanism of excited state decay. Laser spectroscopy. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Scott

CHEM 280. Chemistry and Biochemistry of Gaseous Molecules. (2) Lecture, one hour; discussion, one 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. Letter grades will be assigned to students who present a seminar or submit a term paper; others will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit. Morton

CHEM 282. Elementary Processes in Atmospheric Chemistry. (2) Seminar, two 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 quantita- tive understandings of atmospheric free-radical intermediates, their photophysics, and their reaction mecha- nisms. Letter grades are assigned to students who present a seminar or submit a term paper; other students are graded Satisfactory (S) or No Credit (NC). Course is repeatable. Zhang

CHEM 283. Development of Inorganic Solid State Materials. (2) Seminar, two hours. Prerequisite(s): graduate standing or 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 use of synthetic strategies for the discovery of new functional materials with novel properties. Letter grades are assigned to students who present a seminar or submit a term paper; other students receive Satisfactory (S) or No Credit (NC) based on seminar participation. Course is repeatable. Feng

CHEM 284. Biological Mass Spectrometry. (2) Seminar, two 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, two hours. Prerequisite(s): graduate standing or consent of instructor. A study of biomate- rials and their application in analytical chemistry. Focus is on the design and synthesis of new materials, electro- chemical detection, and the Surface Plasmon Resonance (SPR) technique. Students who present a seminar or sub- mit a term paper receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable.

CHEM 287. Colloquium in Neuroscience. (1) Colloquium, one hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports on current research topics in neuroscience with presentations by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 287, BIOL 287, BMSC 287, NRS 287, and PSY 287. Hatton in charge

CHEM 289. Special Topics in Neuroscience. (2) Seminar, two 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 offered. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 289, BIOL 289, BMSC 289, ENTRM 289, NRS 289, and PSY 289. Hatton in charge

CHEM 297. Directed Research. (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. 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, one 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 Practice. (1-2) Lecture/laboratory, four to eight 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.

CHEM 403. Special Techniques in Chemical Research. (1) Lecture, one hour. Prerequisite(s): graduate status and consent of instructor. The course will cover special techniques in chemical research, such as spectrophotometry, analytical techniques, etc. used in chemical research. The course will be graded Satisfactory (S) or No Credit (NC). May be repeated for credit.
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 student affairs offices in the College of Humanities, Arts, and Social Sciences, the College of Natural and Agricultural Sciences, or the 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.

### COMPARATIVE LITERATURE AND FOREIGN LANGUAGES

**Professors**

- David K. Danow, Ph.D., Russian and Comparative Literature
- Reinhold Grimm, Ph.D., Comparative Literature and German Studies
- Georg M. Gugelberger, Ph.D., Comparative Literature
- Stephanie B. Hammer, Ph.D., Comparative Literature and German Studies
- Lisa A. Raphals, Ph.D., Chinese and Comparative Ancient Civilizations
- Thomas F. Scanlon, Ph.D., Classics and Comparative Ancient Civilizations
- George E. Slussier, Ph.D., Comparative Literature and Civilizations
- Yenna Wu, Ph.D., Asian Languages and Civilizations

**Professors Emeriti**

- Anastasius C. Bandy, Ph.D., Classics
- Sam J. Borg, Ph.D., French
- Donald G. Daviau, Ph.D., Germanic Studies
- Henry W. Decker, Ph.D., French
- Robert B. Griffin, Ph.D., Comparative Literature and French
- Jules E. Levin, Ph.D., Linguistics and Russian
- Keith H. Macfarlane, Ph.D., French
- Eulud Martinez, Ph.D., Comparative Literature (Comparative Literature and Foreign Languages/Creative Writing)
- Louis A. Pedrotti, Ph.D., Russian
- Josef Purkart, Ph.D., Germanic Studies
- Lubomir Radoyce, M.A., Comparative Literature and Russian
- Guenther C. Rimbach, Ph.D., German Studies
- Ben F. Stoltzfus, Ph.D., Litt.D., Comparative Literature and French
- Ivan Strukov, Ph.D., Comparative Literature and Foreign Languages/Creative Writing

**Associate Professors**

- Theda Shapiro, Ph.D., French
- Yang Ye, Ph.D., Asian Languages and Civilizations

**Assistant Professors**

- Michelle E. Bloom, Ph.D., Comparative Literature and French
- Christopher Bolton, Ph.D., Japanese

**Visiting Assistant Professor**

- Simone Yeomans, Ph.D., Germanic Studies

**Lecturers**

- Jingsong Chen, Ph.D., Chinese
- Christine Duverge, M.A., French
- Yoshiko T. Hain, M.A., Japanese

Benjamin King, Ph.D., Classics
Namhee Lee, M.A., Korean
Nicolella Tinozzi Mehrmand, Ph.D., Italian
Valerie Morgan, M.A., French
Sylvia Ochs, M.A., Germanic Studies
Wendy J. Raschke, Ph.D., Classics/Comparative Ancient Civilizations
Kelle Truby, Ph.D., French
Heidi Waltz, Ph.D., Linguistics/Germanic Studies
Helen Xu, M.A., Chinese
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 (including World Literature), in Comparative Ancient Civilizations, and in Linguistics. Its programs encourage a wide variety of both disciplinary and interdisciplinary interests. 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.

Some subject areas, such as Chinese, Classical Studies, French, Germanic Studies, and Russian Studies, offer both a major and a minor. Others do not currently have a major, but a minor is available, as in Italian Studies and Japanese.

The department offers the following majors leading to the B.A. degree.

### Chinese

The B.A. in Chinese is for the student interested in the study of the Chinese language and Chinese culture or literature.

(a) The Chinese Language and Literature Option is designed for students who wish to pursue graduate studies in the field.

(b) The Chinese Language and Culture Option is for students who want to approach Chinese culture and civilization in greater breadth.

### 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.

### 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 con-
structions of civilizations in general.

Comparative Literature
The department offers the B.A. degree in
Comparative Literature and the M.A. and Ph.D.
graduate degrees.

While students majoring in Comparative
Literature must have a knowledge of the lan-
guages involved in the literatures of their
choice, Comparative Literature courses them-
selves are open to all students. All work is
done in translation and the courses are given in
English. Students take both Comparative
Literature and World Literature courses for the
major. World Literature courses do not com-
prise a degree program; the topics are more
general than those in Comparative Literature
and include a whole range of interdisciplinary
studies on the interrelations of literature.

French, Germanic Studies, and
Russian Studies
The B.A. degree is offered in French,
Germanic Studies, and Russian Studies.

Students interested in pursuing graduate stud-
ies in areas not offering the M.A. or Ph.D. may
do so through the graduate program in
Comparative Literature. Requirements for
degrees include proficiency in the language of
the literature.

(a) The Literature Option is available for
majors in French

(b) The Civilization Option is available for
majors in French. Civilization studies are
concerned with the culture of the language
or literature of a student's focus, and with
the people of the country where that lan-
guage or literature exists or existed.

Specific requirements for the various civi-
lization options are listed under French.

Language
The Language Major allows a student to special-
ize in two or three foreign languages through a
knowledge not only of the languages themselves
but also of the bases of language (linguistics),
elements of their creative use (literature), and
the cultures which they reflect (civilization).

Linguistics
A B.A. in Linguistics is available through a pro-
gram 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.

Other Course Work
The department also offers course work in
Asian literature, Chinese (language, literature,
and culture), Civilization, Italian (language
and literature), Japanese (language, literature,
and culture), Korean (language), and World
Literature. Doctoral studies in French and

Comparative Studies
Comparative Literature (interliterary) M.A.
Comparative Literature (interliterary or inter-
disciplinary) Ph.D.

Teaching Assistantships
and Fellowships
Teaching assistantships and fellowships are available. Teaching assistants are normally
held for ITLG 301 (Teaching of Foreign
Language at the College Level). Course work
and/or teaching experience at another college-
level institution may be accepted in fulfillment
of this requirement.

Teaching Credential Waivers
Details and counseling on the Bridge to
Teaching Program, a waiver program for the
multiple subjects teaching credential, are
available in the Liberal Studies and Interdisci-
plinary Programs office, (909) 787-2742.
Details and counseling on other waiver pro-
grams are available in the Graduate School of
Education.

Education Abroad Program
The Comparative Literature and Foreign Lan-
guages department encourages eligible students
to participate in the Education Abroad Pro-
gram (EAP). The EAP is an excellent oppor-
tunity to become deeply familiar with another
country and its culture while earning academic
units towards graduation. In addition to year-
long programs, a wide range of shorter options
is available. While on EAP, students are still eli-
gible for financial assistance. Students are
advised to plan study abroad well in advance to
ensure that the courses taken fit their overall
program at UCR. Consult the departmental
student affairs officer or Professor Shapiro.

See Education Abroad Program under Inter-
national Services Center in the Student Services
section of this catalog. A list of participating
countries is found under Education Abroad
Program in the Curricula and Courses section.

Degree Requirements
University Requirements
See the Undergraduate Studies section for
requirements that all students must satisfy.

College Requirements
See Degree Requirements, College of Human-
ities, Arts, and Social Sciences, in the Under-
graduate Studies Section, for requirements
that students must satisfy.

Major Requirements
Requirements for the majors and courses off-
ered are described in the sections that follow.

Asian Languages and Civilizations
Chinese (Mandarin)
Japanese
Korean

Civilization
Classical Studies
Classics
Greek
Latin

Comparative Studies
Comparative Ancient Civilizations
Comparative and World Literature

Foreign Languages, Language,
and Linguistics
French
Germanic Studies
Italian
Language
Russian Studies
Literatures and Languages
Linguistics

170 / Curricula and Courses
site, at www.ueap.ucsb.edu or contact UC Riverside's International Services Center at (909) 787-4113. See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

MAJOR

The Chinese major is for students interested in the study of the Chinese language and Chinese culture or literature. Students should consult their advisors to design a set of courses on one of the following tracks. Track A is for students who may wish to pursue graduate studies in the field. Track B is for students who may want to approach Chinese culture and civilization in greater breadth.

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 for date and time. Transfer students who have taken college-level language courses cannot take the examination and should consult with their advisors. No college-level credit may be duplicated.

Track A: Chinese Language and Literature

Students who major in Track A are expected to have completed the third-year level of Chinese (CHN 101 series) or else to demonstrate equivalent proficiency. Proficiency can be demonstrated by placement examination, by challenging and testing out of CHN 101 series, or by successful completion of CHN 105, CHN 108, CHN 110 (E-Z), or CHN 115 (E-Z). Students also complete a total number of 48 units, distributed under the following three categories:

1. Twenty (20) units of upper-division courses in Chinese language, taught in Chinese: CHN 105, CHN 108, CHN 110 (E-Z)* (students may take more than one segment), CHN 115 (E-Z)* (students may take more than one segment).

2. Eight (8) units drawn from the following list, or any other course related to China, with advisor's consent:
   - AHS 140/AST 140, AHS 141/AST 141, AHS 143/AST 143, AST 142/CHN 142/RLST 142** (students may take more than one segment), CPT 144/RLST 144/HIST 180, HIST 181, HIST 182, RLST 103

3. Eight (8) units drawn from the following list, or any other course related to China, with advisor's consent:
   - AHS 140/AST 140, AHS 141/AST 141, AHS 143/AST 143, AST 142/CHN 142/RLST 142** (students may take more than one segment), CPT 144/RLST 144/HIST 180, HIST 181, HIST 182, RLST 103

Track B: Chinese Language and Culture

Students who major in Track B are expected to have completed the third-year level of Chinese (CHN 101 series) or else to demonstrate equivalent proficiency. Proficiency can be demonstrated by placement examination, by challenging and testing out of CHN 101 series, or by successful completion of CHN 105, CHN 108, CHN 110 (E-Z), or CHN 115 (E-Z). Students also complete a total number of 48 units, distributed under the following two categories:

1. Twenty (20) units of upper-division courses in Chinese language, taught in Chinese: CHN 105, CHN 108, CHN 110 (E-Z)* (students may take more than one segment), CHN 115 (E-Z)* (students may take more than one segment).

2. Culture and Civilization requirement:
   - Twenty-eight (28) units of upper-division courses from the following courses, or any other course related to China, with advisor's consent:
     - AHS 140/AST 140, AHS 141/AST 141, AHS 143/AST 143
     - CHN 104, CHN 110 (E-Z), CHN 115 (E-Z) (Students may take more than one segment), CHN 190 (may be repeated on different topics)
     - CPT 144/RLST 144/HIST 180, HIST 181, HIST 182, RLST 103

Minor

The Chinese minor provides students the opportunity to complement their majors in different areas, such as Anthropology, Art History, Dance, Economics, History, Liberal Studies, Political Science, Religious Studies, etc., with basic communication skills and understanding of Chinese language and culture.

Students are expected to have completed the third-year level of Chinese (CHN 101 series) or else to demonstrate equivalent proficiency. Proficiency can be demonstrated by placement examination, by challenging and testing out of CHN 101 series, or by successful completion of CHN 105, CHN 108, CHN 110 (E-Z), or CHN 115 (E-Z). Students also complete a total number of 16 upper-division units, distributed as follows:

1. Eight (8) units drawn from the following courses: CHN 105, CHN 108, CHN 110 (E-Z), or CHN 115 (E-Z) (Students may take more than one segment)

2. Eight (8) units drawn from the following courses, or any other course related to China, with advisor's consent:
   - AHS 141/AST 141, AHS 143/AST 143
   - AST 130A/CHN 130A, AST 130B/CHN 130B, AST 135/CHN 135, AST 136/CHN 136, AST 148/CHN 148, AST 185/CHN 185, AST 142/CHN 142/RLST 142
   - CHN 104, CHN 110 (E-Z), CHN 115 (E-Z) (Students may take more than one segment), CHN 190 (may be repeated on different topics)
   - HIST 180, HIST 181, HIST 182
   - RLST 103, RLST 144/CPT 144

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

LOWER-DIVISION COURSES

CHN 001. First-Year Chinese. (4) Lecture, four hours. Prerequisite(s): none. An introduction to the sound system and grammar of Chinese, with attention to the development of the four skills: understanding, speaking, reading and writing. Classes conducted in Chinese as far as possible. Audio-lingual learning materials available in the language laboratory.

CHN 002. First-Year Chinese. (4) Lecture, four hours. Prerequisite(s): CHN 001 or equivalent. An introduction to the sound system and grammar of Chinese, with attention to the development of the four skills: understanding, speaking, reading and writing. Classes conducted in Chinese as far as possible. Audio-lingual learning materials available in the language laboratory.

CHN 003. First-Year Chinese. (4) Lecture, four hours. Prerequisite(s): CHN 002 or equivalent. An introduction to the sound system and grammar of Chinese, with attention to the development of the four skills: understanding, speaking, reading and writing. Classes conducted in Chinese as far as possible. Audio-lingual learning materials available in the language laboratory.

CHN 004. Second-Year Chinese. (4) Lecture, four hours. Prerequisite(s): CHN 003 or equivalent. Covers reading, listening, speaking, and writing. Lectures are conducted primarily in Putonghua (Mandarin) and when necessary in English. The textbooks are in the standardized simplified characters.

CHN 005. Second-Year Chinese. (4) Lecture, four hours. Prerequisite(s): CHN 004 or equivalent. Covers reading, listening, speaking, and writing. Lectures are conducted primarily in Putonghua (Mandarin) and when necessary in English. The textbooks are in the standardized simplified characters.

CHN 006. Second-Year Chinese. (4) Lecture, four hours. Prerequisite(s): CHN 005 or equivalent. Covers reading, listening, speaking, and writing. Lectures are...
conducted primarily in Putonghua (Mandarin) and when necessary in English. The textbooks are in the standardized simplified characters.

CHN 025. Conversation and Composition. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): CHN 003 or equivalent. Practice at the intermediate level in speaking and writing Chinese. Regular discussion and oral presentation of assigned written topics. A review of basic grammar with an aim to active oral and written command. 

CHN 030. Introduction to Chinese Civilization. (4) Lecture, two hours; discussion, one hour; extra reading, three 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. Audiovisual media is used. All work is done in English. Cross-listed with AST 030. Ye

CHN 040. Masterworks of Chinese Literature. (4) Lecture, three hours; outside research, three 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. Ye

CHN 048. Chinese Cinema. (4) Lecture, two hours; discussion, one hour; screening, two hours; outside research, one hour. Prerequisite(s): none. Study of selected films from China and Taiwan with attention to cultural 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, three to fifteen 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, three hours; individual study, three hours. Prerequisite(s): CHN 006 or equivalent or consent of instructor. A continuation of studies in the modern Chinese vernacular. Explores textbook readings and different styles of writing derived from newspaper columns, Marvel comics, and short stories. Involves frequent exercises in English-Chinese translation and free composition.

CHN 101B. Third-Year Chinese. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): CHN 101A or equivalent or consent of instructor. A continuation of studies in the modern Chinese vernacular. Explores textbook readings and different styles of writing derived from newspaper columns, Marvel comics, and short stories. Involves frequent exercises in English-Chinese translation and free composition.

CHN 101C. Third-Year Chinese. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): CHN 101B or equivalent or consent of instructor. A continuation of studies in the modern Chinese vernacular. Explores textbook readings and different styles of writing derived from newspaper columns, Marvel comics, and short stories. Involves frequent exercises in English-Chinese translation and free composition.

CHN 104. Introduction to Classical Chinese Texts. (4) Lecture, three hours; consultation, one 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, three hours; term paper, three hours. Prerequisite(s): CHN 006 or equivalent. Close reading of selected texts from the Han and pre-Han period, chosen to illustrate the main features of the Chinese Ku-xin (classical prose). Ye

CHN 107. Taoist Traditions. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): AST 030/CHN 030 or upper-division standing or consent of instructor. An overview of Taoist history 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, three hours; extra reading, three hours. Prerequisite(s): CHN 101C or equivalent or consent of instructor. Reading and explication of representative texts in various genres and forms, chosen to illustrate the development of classical Chinese poetry from its origin through the premodern age. Classes are conducted primarily in Chinese. Ye

CHN 110 (E-Z). Readings in Twentieth-Century Chinese Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): CHN 101C or equivalent or consent of instructor. Representative works of major authors. Readings and discussions are conducted in Chinese. E. Contemporary Chinese Fiction; M. Modern Chinese Fiction; S. Modern Chinese Poetry; W. Modern Chinese Prose. Wu, Ye

CHN 115 (E-Z). Readings in Thirteenth- to Nineteenth-Century Chinese Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): CHN 101C or equivalent or consent of instructor. Vernacular literature from the Yuan to the Qing dynasties. Readings and discussions are conducted in Chinese. G. Honglou meng; M. Ming Novel; Q. Qing Novel; S. The Short Story; Y. Yuan Drama. Wu

CHN 130A. Chinese Literature in Translation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Knowledge of Chinese not required. Includes lectures and collateral reading of representative works in English and translation. Covers poetry, historical records, essays, drama, and fiction from Earliest Times to the Yuan Dynasty (1368 A.D.).

CHN 130B. Chinese Literature in Translation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Knowledge of Chinese not required. Includes lectures and collateral reading of representative works in English and translation. Covers drama and fiction from the fourteenth century to the end of the Qing Dynasty (1911 A.D.). Can be taken out of sequence. Cross-listed with AST 130A. Wu, Ye

CHN 135. Great Novels of China. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, three 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 142. Chuang-tzu. (4) Lecture, one hour; discussion, two hours; outside research, one hour; extra reading, one hour. Prerequisite(s): AST 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 can 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, two hours; discussion, one hour; extra reading, three 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, two hours; discussion, one hour; screening, two hours; extra reading, one hour. 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; films to be shown from videocassettes are mostly with English subtitles. Cross-listed with AST 185. Ye

CHN 190. Special Studies. (1-5) Individual study, three to fifteen hours. Prerequisite(s): upper-division standing or consent of instructor. Individual research and preparation of a thesis completed under the supervision of a faculty member. Course is repeatable.

CHN 195. Senior Thesis. (2-4) Thesis, six to twelve hours. Prerequisite(s): senior standing; consent of instructor. Individual research and preparation of a thesis. Students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113. See Education Abroad Program under Interna-
tional Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

Enroll in a concentrated beginning or intermediate study program at Fuku-
yama University, located near Hiroshima. Students may earn a year’s worth of university language credit in one month. Contact Karen

JAPANESE

Subject abbreviation: JPN

The Japanese minor allows students to combine offerings from different fields and departments to pursue systematically the study of Japanese language and culture. Students are encouraged to consider opportunities for study in Japan 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 toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113. See Education Abroad Program under Interna-
tional Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.
LOWER-DIVISION COURSES

JPN 001. First-Year Japanese. (4) Lecture, four hours. Prerequisite(s): none. An introduction to the sound system and grammar of Japanese with emphasis on speaking, reading, writing, and understanding. Classes conducted in Japanese insofar as possible.

JPN 002. First-Year Japanese. (4) Lecture, four hours. Prerequisite(s): JPN 001 or equivalent. An introduction to the sound system and grammar of Japanese with emphasis on speaking, reading, writing, and understanding. Classes conducted in Japanese insofar as possible.

JPN 003. First-Year Japanese. (4) Lecture, four hours. Prerequisite(s): JPN 002 or equivalent. An introduction to the sound system and grammar of Japanese with emphasis on speaking, reading, writing, and understanding. Classes conducted in Japanese insofar as possible.

JPN 004. Second-Year Japanese. (4) Lecture, four hours. Prerequisite(s): JPN 003 or equivalent. Introduces levels of speech and emphasizes reading and writing of advanced prose.

JPN 005. Second-Year Japanese. (4) Lecture, four hours. Prerequisite(s): JPN 004 or equivalent. Concentrates on advanced speech levels and their cultural underpinnings.

JPN 006. Second-Year Japanese. (4) Lecture, four hours. Prerequisite(s): JPN 005 or equivalent. Emphasizes the academic style of written and spoken Japanese and academic comprehension of the cultural background.

JPN 022. Introduction to Japanese Film. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. An introduction to Japan's major directors and to watching and writing about Japanese film.

JPN 034. Early Japanese Civilization. (4) Lecture, three hours; term paper, three 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.

JPN 035. Modern Japanese Society. (4) Lecture, three hours; discussion, one 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 090. Special Studies. (1-5) Individual study, three to fifteen 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, three hours; discussion, one 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, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): JPN 101B. Designed to develop students' reading, writing, and speaking abilities in Japanese. The course is conducted in Japanese.

JPN 142. Modern Japanese Literature. (4) Lecture, four hours. Prerequisite(s): upper-division standing or consent of instructor. The course covers major works of modern and contemporary Japanese literature in translation.

JPN 150. In Women's Hands: Reading Japanese Women Writers. (4) Lecture, three hours; term paper, three 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.

KOREAN

Subject abbreviation: KOR

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 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.
LOWER-DIVISION COURSES

KOR 001. First-Year Korean. (4) Lecture, four hours. Prerequisite(s): none. An introduction to the sound system and grammar of Korean with emphasis on reading, writing, understanding, and speaking.

KOR 002. First-Year Korean. (4) Lecture, four hours. Prerequisite(s): KOR 001. An introduction to the sound system and grammar of Korean with emphasis on reading, writing, understanding, and speaking.

KOR 003. First-Year Korean. (4) Lecture, four hours. Prerequisite(s): KOR 002. An introduction to the sound system and grammar of Korean with emphasis on reading, writing, understanding, and speaking.

KOR 004. Second-Year Korean. (4) Lecture, four hours. Prerequisite(s): KOR 003 or equivalent or consent of instructor. Emphasizes reading, writing, grammar, and conversation.

KOR 005. Second-Year Korean. (4) Lecture, four hours. Prerequisite(s): KOR 004 or KOR 025 or consent of instructor. Emphasizes reading, writing, grammar, and conversation. Conducted primarily in Korean.

KOR 025. Conversation and Composition. (4) Lecture, four 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.

CIVILIZATION

Committee in Charge
Sylvia Ochs, M.A. Germanic Studies
Wendy J. Raschke, Ph.D. Classics/Comparative Ancient Civilizations
Theda Shapiro, Ph.D. French
Nicoletta Tinozzi Mehrmand, Ph.D. Italian
Yang Ye, Ph.D. Asian Languages and Civilizations
Patricia O’Brien, 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 025. Introduction to European Culture. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. A study of major characteristics of Western culture and the influence of Western ideas and institutions throughout the world. Emphasis on the ways in which society, economy, ideas, and technology interact to produce change. Audio-visual presentations demonstrate European forms in the arts, private life, and urban and rural environments. All work is done in English.

EUR 030 (E-Z). Themes in French Civilization. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): none. Examines major aspects of French and Francophone cultures, studied through art history, history, literature, and ethnography. E. Françoise and America; W. The Frenchwoman. No knowledge of French is necessary.

EUR 047. Introduction to Russian Culture. (4) Lecture, three hours; consultation, one hour. A multime-dia introduction to Russian culture. Emphasis on Russian masterpiece in art, architecture, dance, theatre, litera-

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EUR 111A. Survey of Russian Civilization. (4) Lecture, three hours; consultation, one hour. Covers pre-twentieth century Russian music, architecture, and art. Any course within the EUR 111A, EUR 111B, EUR 111C, and EUR 111D sequence may be taken independently. No knowledge of Russian is necessary.

EUR 111B. Survey of Russian Civilization. (4) Lecture, three hours; consultation, one hour. Covers Russian philosophy, religion, and science. Any course within the EUR 111A, EUR 111B, EUR 111C, and EUR 111D sequence may be taken independently. No knowledge of Russian is necessary.

EUR 111C. Survey of Russian Civilization. (4) Lecture, three hours; consultation, one hour. Covers Russian civilization and the Great Emigration. Any course within the EUR 111A, EUR 111B, EUR 111C, and EUR 111D sequence may be taken independently. No knowledge of Russian is necessary.

EUR 112A. Survey of Germanic Cultures and Institutions. (4) Lecture, three hours; outside reading, three hours. Prerequisite(s): none. Covers the humanism, baroque, and enlightenment periods to 1750. Any course within the EUR 112A, EUR 112B, and EUR 112C sequence may be taken independently. No knowledge of German is required. Gugelberger

EUR 112B. Survey of Germanic Cultures and Institutions. (4) Lecture, three hours; outside reading, three hours. Prerequisite(s): none. Covers German civilization, 1750 to 1880. Any course within the EUR 112A, EUR 112B, and EUR 112C sequence may be taken independently. No knowledge of German is required. Gugelberger

EUR 112C. Survey of Germanic Cultures and Institutions. (4) Lecture, three hours; outside reading, three hours. Prerequisite(s): none. Covers German civilization, 1880 to the present. Any course within the EUR 112A, EUR 112B, and EUR 112C sequence may be taken independently. No knowledge of German is required. Gugelberger

EUR 113 (E-Z). Special Topics in Russian Civilization. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): upper-division standing or consent of instructor. An in-depth study of selected topics dealing with Russian cultural phenomena, for example, medieval Russian civilization and Moscow versus St. Petersburg/ Leningrad as representatives of two opposing cultural and philosophical worlds. No knowledge of Russian is necessary. Shapiro

EUR 114A. French Civilization: Middle Ages. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Interdisciplinary study of major aspects of French culture. Each course in the EUR 114A, EUR 114B, and EUR 114C sequence may be taken independently of the others. No knowledge of French is necessary. Shapiro

EUR 114B. French Civilization: Renaissance and Ancien Régime. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Interdisciplinary study of major aspects of French culture. Each course in the EUR 114A, EUR 114B, and EUR 114C sequence may be taken independently of the others. No knowledge of French is necessary. Shapiro

EUR 114C. French Civilization: French Revolution to the Belle Epoque. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Interdisciplinary study of major aspects of French culture. Each course in the EUR 114A, EUR 114B, and EUR 114C sequence may be taken independently of the others. No knowledge of French is necessary. Shapiro

EUR 115 (E-Z). French Studies. (4) Lecture, three hours; term paper, three 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 116A. Modern and Contemporary France: 1914-1958. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Interdisciplinary study of French society, culture, politics, and institutions. EUR 116A and EUR 116B may be taken independently of each other. No knowledge of French is necessary. Shapiro

EUR 116B. Modern and Contemporary France: 1958 to the Present. (4) Lecture, three hours, extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Interdisciplinary study of French society, culture, politics, and institutions. EUR 116A and EUR 116B may be taken independently of each other. No knowledge of French is necessary. Shapiro

EUR 116C. Modern and Contemporary France: Pre-Columbian Period to Independence. (4) Lecture, three hours; read and consult, one hour. Covers the pre-Columbian period to independence. No knowledge of Spanish is necessary. Credit is awarded for only one of the LNST 114A and LNST 114B sequence or SPN 102B.

EUR 117B. Survey of Latin American Culture and Civilization: Modern Period. (4) Lecture, three hours; read and consult, one hour. Covers the modern period. No knowledge of Spanish is necessary. Credit is awarded for only one of the LNST 118A and LNST 118B sequence or SPN 102B.

EUR 119 (E-Z). Topics in Italian Culture. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, one hour; written work, two 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 191. Seminar in European Civilization. (4) Seminar, three hours; consultation, one hour. Discussion and research on a selected theme related to European civilizations. Advanced methodological training and comparative approaches will be emphasized. Topics may include: urban and/or rural life, the family, women, education, cultural creativity. Course may be repeated for credit up to 12 units.
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 languages and literature, 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.

1. Language proficiency requirement:
   a) either LATN 001, LATN 002, LATN 003, and LATN 004 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents)
   b) Twelve (12) upper-division units or the equivalent of course work in Latin or Greek

2. Civilization requirement
   a) Either two courses from CLA 010A, CLA 010B, CLA 010C or both CLA 027A and CLA 027B
   b) Lecture, three hours; consultation, one hour.
   c) Greek at or above the 100 level
   d) 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

3. WRLT 015

4. Twenty-four (24) units from the following:
   a) Upper-division Latin or Greek literature courses beyond the language proficiency requirement
   b) AHS 147, AHS 148, CLA 100/HISE 110, CLA 110 (E-Z)/LATN 110 (E-Z), CLA 112/WRLT 112/RSLT 117, CLA 114/WRLT 114, CLA 165, CLA 190, GRK 190, LATN 190, PHIL 121Q, POSC 110, RSLT 136, THEA 125E
   c) Other courses outside the Classics program related to the major with approval of the student's advisor.

Related lower-division courses which are highly recommended are as follows: CLA 022 (Greek and Roman Athletics); CLA 040 (Classical Mythology). In their course selection, students should expose both the Greek and Roman components of the major.

**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 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.

**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, or 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.

1. One course from CLA 010A, CLA 010B, CLA 010C, CLA 027A, or CLA 027B
2. Either LATN 001, LATN 002, LATN 003, and LATN 004 (or equivalents) or GRK 001, GRK 002, and GRK 003 (or equivalents)
3. One upper-division course (4 units) in either Latin or Greek

4. Three courses from among the following (12 units)
   a) Greek at or above the 100 level
   b) Latin at or above the 100 level
   c) AHS 147, AHS 148, CLA 100/HISE 110, CLA 110 (E-Z)/LATN 110 (E-Z), CLA 112/WRLT 112/RSLT 117, CLA 114/WRLT 114, CLA 165, CLA 190, GRK 190, LATN 190, PHIL 121Q, POSC 110, RSLT 136, THEA 125E

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

**CLASSICS**

Subject abbreviation: CLA

**LOWER-DIVISION COURSES**

CLAS 010A. Ancient Civilization: Early Greece and the Mediterranean. (4) Lecture, three hours; term paper, three 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

CLAS 010B. Ancient Civilization: Classical Greece. (4) Lecture, three hours; term paper, three 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

CLAS 010C. Ancient Civilization: Rome. (4) Lecture, three hours; term paper, three 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

CLAS 017. Rome: The Ancient City. (4) Lecture, three hours; extra reading, three 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—the course seeks to introduce students to the Romans and to their importance for later ages. Cross-listed with HIS 030 and HIST 027.

CLAS 020. Word Power from Greek and Latin Roots. (4) Lecture, three hours; consultation, one 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

CLAS 022. Greek and Roman Athletics. (4) Lecture, three hours; consultation, one hour. A study of ancient Greek and Roman athletics and their connections with religion, politics, literature, and art. Primary sources read in translation. Scanlon

CLAS 027A. Classical Literature in Translation: Love and Death. (4) Lecture, three hours; consultation, one hour. Selected readings in Greek-Roman epic, drama, lyric, history, and philosophy.

CLAS 027B. Classical Literature in Translation: Illusion and Reality. (4) Lecture, three hours; consultation, one hour. Selected readings in Greek-Roman epic, drama, lyric, history, and philosophy.

CLAS 030. Scientific Word Power from Latin and Greek Roots. (4) Lecture, three hours; extra reading, three 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

CLAS 040. Classical Mythology. (4) Lecture, three hours; term paper, three hours. 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
UPPER-DIVISION COURSES

CLA 100. Ancient Historians. (4) Lecture, three hours; outside research, two hours; term paper, one 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 110 (E-Z). Latin Literary Genres. (4) Lecture, three hours; term paper, three 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religious views from a variety of theoretical perspectives. Includes material drawn from epic, religious texts, divine hymns, creation myths, heroic legends, and concepts of the afterlife as reflected in literary and nonliterary sources. Cross-listed with RLST 117 and WRIT 112.

CLA 114. The Classical Tradition. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the legacy of Greece and Rome in Western Culture, from the origins of worship in the Greco-Roman world, from Bronze Age sites to the Romans of the late Empire. Lectures, discussion, and time. Transfer students who have taken a college-level language course cannot take the placement examination and should consult the quarterly Schedule of Classes 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.

CLA 120 (E-Z). Themes and Issues of the Classical World. (4) Lecture, three hours; individual study, three 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 165. Greco-Roman Cults and Credence. (4) Lecture, three hours; term paper, three 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.

CPLT 290H. Directed Studies. (1-6) Description under Comparative Literature. 290H: Greek.

GRK 292. Concurrent Analytical Studies. (2) Research, six 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.

LATIN

LATN 301. Teaching of Foreign Language at the College Level. (4) Description under Literature and Languages.

LOWER-DIVISION COURSES

LATN 001. Introduction to Latin. (4) Lecture, four 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, four hours. Prerequisite(s): LATN 001. Intensive study of the fundamentals of the Latin language with practice in reading and writing.

LATN 003. Introduction to Latin. (4) Lecture, four hours. Prerequisite(s): LATN 002. Intensive study of the fundamentals of the Latin language with practice in reading and writing.

LATN 004. Intermediate Latin. (4) Lecture, three hours; three weekly grammar study projects. Prerequisite(s): LATN 003 or equivalent. 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. Raschke

UPPER-DIVISION COURSES

LATN 101 (E-Z). Advanced Latin Reading and Grammar. (4) Lecture; three hours; extra reading, three 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, three hours; term paper, three 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 contemporaneous 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, three hours; extra reading, three hours. Prerequisite(s): LATN 004 or equivalent. Reading and discussion of Latin prose fiction as represented by Petronius’ Satyricon and/or Aulus Pudens’ Metamorphoses. Emphasis given to the development of the romantic novel in Latin. Raschke

LATN 190. Special Studies. (1-5) Individual study, three to fifteen 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 290L. Directed Studies. (1-6) Description under Comparative Literature. 290L: Latin.

LATN 292. Concurrent Analytical Studies. (2) Research, six 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

LTLG 301. Teaching of Foreign Language at the College Level. (4) Description under Literature and Languages.

THE UC TRI-CAMPUS GRADUATE PROGRAM IN CLASSICS

web2.hnet.ucsd.edu/classics/Tricampus
(UC Irvine, UC Riverside, and UC San Diego)

The University of California Tri-Campus Graduate Program in Classics is a joint venture that combines faculty in Classics and related disciplines from the three southernmost University of California 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 are expected to 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 CLASSIC 220) and reading courses (UC Riverside CLA 292/UC Irvine CLASSIC 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

The requirements for the M.A. degree in Classics are two years (six quarters) of coursework, passage of a special set of examinations, and completion of a master’s paper. The expected time for completion of the M.A. degree is two years. The normal course load is three to five levels each quarter. Minimum core requirements are four quarters of CLA 200A, CLA 200B, CLA 200C, and CLA 201; four quarters of UC Riverside CLA 292/UC Irvine CLASSIC 205; and four quarters of UC Riverside CLA 250/UC Irvine CLASSIC 220. (UC Riverside CLA 290/UC Irvine CLASSIC 280 may be substituted for these courses at the discretion of the faculty.) A reading knowledge of either Germanic Studies, French, Italian, or equivalent language, demonstrated by examination or other means, is a also a requirement.

Doctoral Degree

The requirements for the Ph.D. degree in Classics are three years (nine quarters) of coursework. Minimum core requirements are four quarters of CLA 200A, CLA 200B, CLA 200C, and CLA 201; five quarters of UC Riverside CLA 292/UC Irvine CLASSIC 205; and six quarters of UC Riverside CLA 250/UC Irvine CLASSIC 220 or an equivalent course. (UC Riverside CLA 290/UC Irvine CLASSIC 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. At this stage, and during the fourth year of study, students are expected to have read extensively in the primary texts and in literary history and theory and in ancient history. In addition, experience in supervised teaching and/or research activity is normally required. To qualify as a candidate for the Ph.D. 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 expected time for the completion of the Ph.D. is six years.

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.

Faculty

Thomas E. Scanlon, Ph.D.
Professor of Classics, and Program Director, UCR Greek and Roman Historiography, Ancient Athletics

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

Theodore E. Brunner, Ph.D.
Professor Emeritus of Classics, UCI Computer Application to Classical 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 supervisor, UCI Greek prose, Historiography

Walter Donlan, Ph.D.
Professor of Classics, graduate advisor, UCI Early Greek Literature, Greek Social History

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, 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 of History and Classics, UCI Roman history, Latin Elegy and Satire, Classical Tradition

David Glidden, Ph.D.
Professor of Philosophy, UCR Greek and Roman Philosophy

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.
Professor of History, USCD
Early Christian Thought, Greek Chronography, Early Greek History
Sheldon Nodelman, Ph.D.
Associate Professor of Visual Arts, USCD
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
Wendy Raschke, Ph.D.
Lecturer in Classics, UCR
Roman Satire, Greek Art and Archaeology
B. P. Beardon, D.U.
Professor Emeritus of Classics, UCI
Late Greek Literature, Ancient Novel
Michele Salzman, Ph.D.
Professor of History, UCR
Late Antiquity; Roman History and Literature, Religion, Women’s Studies
Gerasimos Santas, Ph.D.
Professor of Philosophy, UCI
Ancient Philosophy, History of Philosophy, Ethics
Gary Shifman, Ph.D.
Assistant Professor of Political Science, USCD
Greek Political Theory
Patrick Sinclair, Ph.D.
Associate Professor of Classics, UCI
Roman Historiography, Latin Lexicography, Rhetoric
Dana F. Sutton, Ph.D.
Professor of Classics, UCI
Greek and Latin drama, Greek poetry, Anglo-Latin Literature
Eliot Wirshbo, Ph.D.
Lecturer in Classics and Comparative Literature, USCD
Greek Epic, Folklore

G R A D U A T E  C O U R S E S
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, three hours; individual study, three 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, three hours; individual study, three 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 and Their Contemporary Cultural Contexts. (4) Lecture, three hours; individual study, three 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. Computing in Classical Studies. (4) Lecture, three hours; individual study, three 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 CLASSIC 201. Course is repeatable.

CLA 210. Computer Assisted Library Research. (1-6) Seminar, three hours; individual study, three 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, three to eighteen hours. Prerequisite(s): consent of instructor and graduate advisor; normally only open 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 Study in Classics. (2) Individual study, six 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 295. Course is repeatable.

CLA 297. Directed Research. (1-6) Outside research, three to eighteen 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, three to thirty-six 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.

D G R A D U A T E  M A J O R

M A J O R

1. Lower-division requirements (8 units): CPAC 001, CPAC 002
2. Upper-division requirements (44 units)
   a) Four (4) units of CPAC 101 (E-Z)
   b) Forty (40) units including:
      (1) At least 12 units from any of CPAC 110 (E-Z), CPAC 120 (E-Z), CPAC 130 (E-Z), CPAC 140 (E-Z)
      (2) The balance from any of the following upper-division courses in

C O M P A R A T I V E  A N C I E N T  C I V I L I Z A T I O N S

Subject abbreviation: CPAC

Committee in Charge
Wendy Ashmore, Ph.D. (Anthropology)
Lucile Chia, Ph.D. (History)

David Gildden, Ph.D. (Philosophy)
John Laursen, Ph.D. (Political Science)
Vivian Nityray, Ph.D. (Religious Studies)
Thomas Patterson, Ph.D. (Anthropology)
Wendy Rashke, Ph.D. (Comparative Literature and Foreign Languages)
Francesca Rochberg, Ph.D. (History)
Thomas F. Scanlon, Ph.D. (Classics and Comparative Ancient Civilizations)
Carl Taube, Ph.D. (Anthropology)
R.E. Taylor, Ph.D. (Anthropology)
Carlos Veléz-Ibáñez, Ph.D. (Anthropology)
Patricia O’Brien, 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.

The career opportunities for majors in this area are the same as those of any high quality liberal arts degree which imparts the skills of communication and analysis; graduate study in History, Art History, Philosophy, Classics, Religious Studies, Political Studies, Comparative Literature, Anthropology, Gender and Women’s Studies, and other humanities and social sciences; professional schools in law or business; careers in areas of international consultation, travel, communications, museums, etc. Career options may of course depend on the individual focus and emphasis within the major course in related disciplines. One consistent advisor for the major is appointed from the Comparative Ancient Civilizations faculty to consult closely with each student and devise an individual curriculum which best fits the student’s interest and career goals.
related disciplines; students are recommended, in consultation with their advisor, to focus on one or two ancient civilizations in related courses in order 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/RLST 117/WRIT 112 (Mythology)
CLA 114/WRIT 114 (The Classical Tradition)
CLA 120 (E-Z) (Themes and Issues of the Classical World)
CLA 165 (Greco-Roman Cult and Credence)

**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) (Special Topics in American Indian History)

**Greek**

GRK 101 (E-Z) (Advanced Greek Reading and Grammar)

**History**

HIST 103 (History of Science from Antiquity to Copernicus)
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)
HISA 144 (E-Z)/ETST 115 (E-Z) (Topics in Native American History)
HISE 150 (Ancient and Medieval England)
HISE 171 (Early Russia)
HIST 180 (Early Traditional China)
HIST 181 (Late Traditional China)

**Japanese**

JPN 151/AST 151 (Early Japanese Literature)

**Latin**

LATN 101 (Advanced Latin Reading and Grammar)
LATN 110 (E-Z)/CLA 110 (E-Z)
LATN 135 (The Roman Novel)

**Latin American Studies**

LNST 118A (Survey of Latin American Culture and Civilization: Pre-Columbian Period to Independence)

**Philosophy**

PHIL 121Q (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 (Religions of China)
RLST 105 (Religions of Japan)
RLST 106 (Buddhism)
RLST 117/CLA 112/WRIT 112
RLST 124E (Early Judaism)
RLST 124H (The Talmudic 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

**Sociology**

SOC 125 (Human Societies)

**World Literature**

WRIT 112/CLA 112/RLST 117
WRIT 114/CLA 114
Comparative Literature: Plan I (Thesis) and Plan II (Comprehensive Examinations)

Plan I (Thesis)

Requirements are as follows:
1. Eight (8) units in masterworks of world literature (CPLT 217A and CPLT 217B);
2. Eight (8) units in method and theory courses (CPLT 214 and CPLT 215A);
3. Eight (8) units in theory and practice of translation (CPLT 223, may be repeated for credit);
4. Eight (8) graduate units in the first literature, and 4 graduate units each in the second and third literatures (the 8 first literature units will be CPLT 290 workshops in translation, 4 from English into a chosen foreign language, and 4 from a chosen foreign language into English);
5. Four (4) elective units in Comparative Literature.

Plan II (Comprehensive Examination)

Requirements are as follows:
1. Eight (8) units in masterworks of world literature (CPLT 217A and CPLT 217B);
2. Eight (8) units in method and theory courses (CPLT 214 and CPLT 215A);
3. Eight (8) graduate units in a first literature (if the first literature is English, only 4 units may be taken in the English Department); 4 graduate units in a second literature; 4 graduate units in a third literature;
4. Twelve (12) elective graduate units in comparative literature (graduate credit, by consent of instructor, may be given for upper-division Comparative Literature courses when these are taken through a combination of CPLT 290/CPLT 292 courses, directed studies, and concurrent enrollment).

After completing their course work candidates must pass a comprehensive examination. The examination is based upon a reading list, which includes works from each of the major historical periods in one literature (the major specialty), and from one period or genre in each of the other two literatures (the comparative specialty). The list is prepared by appropriate members of the faculty in consultation with the candidate. An oral examination follows the written.

Doctoral Degree

Two tracks are available to students in the Ph.D. program in Comparative Literature:
Interliterary Studies; and Interdisciplinary Studies/Cross-Cultural Studies. Areas of particular strength in the Interdisciplinary/Cross-Cultural Studies are: East-West comparative studies; science fiction and the intersection of science with the humanities; and film and visual studies.

Interliterary This program is designed for students wishing to concentrate in Comparative Literature as an interliterary discipline. Students examine the relationships among various national literatures. They are expected to work in three of the following literatures: Chinese, English, French, Germanic Studies, Greek, Italian, Latin, Japanese, Portuguese, Russian, and Spanish. With approval of the program, permission is granted in exceptional cases to work in other literatures related to the Germanic, Romance, or Slavic families, in Hebrew literature, in other Asian literatures, and the literatures of Africa.

Students must obtain an in-depth knowledge of their first literature (the major specialty), historically, philologically, and critically. In their second 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 a M.A. in literature must take CPLT 217A, CPLT 217B, CPLT 214, and CPLT 215A (or demonstrate having taken similar courses). Course requirements are: two graduate courses in a first literature (8 units), one graduate course in a second literature (4 units), one graduate course in a third literature (4 units), and 12 additional elective units. Students entering the interliterary Ph.D. program with an M.A. in another discipline are required to do course work equivalent to the M.A. degree in Comparative Literature while proceeding with course work for the Ph.D. program.

Interdisciplinary/Cross-Cultural Studies This program is designed for students with interests in interdisciplinary or cross-cultural studies. Students examine relationships between literature and other disciplines (such as art, ethnic studies, film, history, law, music, philosophy, political science, psychology, religious studies, science, sociology, theater), or pursue cross-cultural studies (such as East-West, Judaic, or Third World Studies). Students in this program complete the literary requirements of the program, but substitute an appropriate discipline for one of the secondary literatures. This option is recommended to students who enter Comparative Literature with an M.A. in a non-literary discipline.

Students entering the interdisciplinary/cross-cultural studies Ph.D. program with an M.A. in any discipline must take CPLT 217A, CPLT 217B, CPLT 214, and CPLT 215A. In addition, course requirements are: one graduate course in each of two literatures (8 units); 8 units in another discipline or area of cross-cultural studies; CPLT 286 (for interdisciplinary specialties) or CPLT 276 (for cross-cultural specialties); and 8 elective units. The graduate advisor may require appropriate courses on an individual basis.

Whatever the combination of literatures, or literatures and interdisciplinary field, students are required to study a number of masterworks of world literature to be determined in consultation with the graduate advisor and other faculty. Translations may be used for works in literatures outside the student's specialties.

The Comparative Literature program offers, in conjunction with the Center for Bibliographic Studies, an interdisciplinary option in Science Fiction and Fantasy Studies, which allows students to make use of the large body of primary research materials in the Eaton Collection housed on the UCR campus.

Normally some teaching experience is required for the Ph.D. in Comparative Literature; such experience is obtained through a teaching assistantship whereby a student is assigned either to Comparative or World Literature or to another program.

The written qualifying examination for the Ph.D. in Comparative Literature consists of the following sections:

1. Examinations in the field of the candidate's major specialty (historical, philological, and critical), including a comparative perspective. There is a Specific Reading List drawn up by the student in consultation with his or her committee, reflecting the comparative specialty. This list is in addition to the Basic Reading List in the national literature.

2. Examinations in the field of the candidate's comparative specialty, interliterary or interdisciplinary, based on reading lists drawn up specially for the candidate by designated members of the committee.

The written examinations are followed by an oral qualifying examination. Candidates for the Ph.D. are required to write a dissertation on a topic approved by the dissertation committee, and to sustain an oral examination on the dissertation.

Normative Time to Degree 18 quarters

No “S/N/C”-graded courses may be applied toward the minimum unit requirement for the graduate degree(s).

WRIT 015. Language, Literature, and Culture. (4) Lecture, three hours; individual study, three 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. Danow

WRIT 017A. Masterworks of World Literature. (4) Lecture, three hours; consultation, one hour. Reading and discussion of selected great works from around the world in historical and cultural contexts. Covers antiquity through the enlightenment, stressing textual analysis.

WRIT 017B. Masterworks of World Literature. (4) Lecture, three hours; consultation, one hour. Reading and discussion of selected great works from around the world in historical and cultural contexts. Covers antiquity through the enlightenment, stressing textual analysis.

WRIT 017C. Masterworks of World Literature. (4) Lecture, three hours; consultation, one hour. Reading and discussion of selected great works from around the world in historical and cultural contexts. Covers the modern period, stressing critical methods and approaches to comparative literature.

WRIT 018. The Nature of Narrative. (4) Lecture, three hours; individual study; three 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 including the anecdote, story, tale, novella, and novel. Banow

WRIT 021. Introduction to Film, Literature, and Culture. (4) Lecture, three hours; screening, three 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 FVC 021.

WRIT 022. Introduction to Japanese Film. (4) Lecture, three hours; screening, three 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 JST 022, FVC 022, and JPN 022.

WRIT 025. The Sciences and Humanities through Science Fiction. (4) Lecture, three hours; outside research, three hours. An interdisciplinary course that considers science fiction as an interface between today's scientific and humanistic disciplines. Using books, films, and works of art the course examines the interplay of these disciplines in science fiction's treatment of such "big" themes: time, space, God, nature, mind, and the future. Slusser

WRIT 029. The Arts: Approach, Comparison, and Culture. (4) Lecture, three hours; extra reading, three 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? Raphals

UPPER-DIVISION COURSES

WRIT 110. Literary Analysis and Criticism. (4) Lecture, three hours; extra reading, three 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 specifically on those texts. Reading and discussions cover different genres and traditions as well as different critical approaches. Bloom, Hammer

WRIT 112. Mythology. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religious visions from a variety of theoretical perspectives. Includes material drawn from epics, religious texts, divine hymns, creation myths, heroic legends, and concepts of
CPLT 140: The Development of Classical Modern Drama. (4) Lecture, three hours; written work, three hours. Prerequisite(s): upper-division standing or consent of instructor. Consisting of readings, discussions, and lectures, this course treats plays and theories from the German, Scandinavian, Russian, and French repertoire among others. Covers Naturalism to Expressionism (1880-1918).

CPLT 143. France and Asia in Literature and the Arts. (4) Lecture, three hours; screening, twenty hours per quarter; term paper, one 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, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): RSLT 005 or RSLT 005H or RSLT 101 or RSLT 105 or RSLT 106 or consent of instructor. Readings in canonical Buddhist narratives and examination of the themes of emptiness and impermanence in Buddhist-inspired literature. Examples are drawn from classical and modern Asian prose and poetry as well as from the work of contemporary American authors. Cross-listed with RSLT 144.

CPLT 146. Comedy and Satire. (4) Lecture, three hours; outside reading, three 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. Hammer

CPLT 147 (E-Z). The Novel. (4) Lecture, three hours; term paper, three 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 Essential Novel; E. The Carnivalesque. Credit is awarded for only one of CPLT 147F or HNPG 037J.

CPLT 148. Short Narrative. (4) Lecture, three hours; extra reading, three 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. Danow

CPLT 149A. The Development of Classical Modern Drama. (4) Lecture, three hours; written work, three hours. Prerequisite(s): upper-division standing or consent of instructor. Consisting of readings, discussions, and lectures, this course treats plays and theories from the German, Scandinavian, Russian, and French repertoire among others. Covers Naturalism to Expressionism (1880-1918).

CPLT 149B. The Development of Classical Modern Drama. (4) Lecture, three hours; written work, three hours. Prerequisite(s): upper-division standing or consent of instructor. Consisting of readings, discussions, and lectures, this course treats plays and theories from the German, Scandinavian, Russian, and French repertoire among others. Covers the Theatre of the Grotesque to the Theatre of the Absurd.

CPLT 150 (E-Z). Comparative Cultural Studies: From the Middle Ages to Postmodernism. (4) Lecture, three hours; extra reading, three 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; M. Millenium and Apocalypse; Bloom, Danow, Hammer, Shapiro, Slusser

WRLT 170. Third World Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the many other cultural media through which the comic and temporary Western culture’s two most popular genres. Consisting in some major works associated with Third World literature and film. Emphasis on African, Latin American, Caribbean, African-American, and Chicano literature. Cross-listed with EST 170. Gugelberger

WRLT 171 (E-Z). Auteur and Auteur Theory. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. Considers non-Hollywood cinema in the national, historical, political, and cultural contexts which produced them. E. Experimental and Avant-Garde Film; G. New German Cinema; I. Italian Neorealism; T. Third World Cinema. Cross-listed with FCC 173 (E-Z).

CPLT 173 (E-Z). International Cinemas. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. Considers film in the context of the other arts. Reviews the origins and historical development of cinematic, political, and cultural contexts which produced them. E. Experimental and Avant-Garde Film; G. New German Cinema; I. Italian Neorealism; T. Third World Cinema. Cross-listed with FCC 173 (E-Z).

CPLT 174 (E-Z). Comparative Studies in Film. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates the historical and cultural contexts which produced them. E. The Essential Novel; E. The Carnivalesque. Credit is awarded for only one of CPLT 147F or HNPG 037J.

CPLT 177. Religious Biography. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins and historical development of the comic and temporary Western culture’s two most popular genres. Consisting in some major works associated with Third World literature and film. Emphasis on African, Latin American, Caribbean, African-American, and Chicano literature. Cross-listed with FCC 173 (E-Z).

WRLT 178. Religious Biography. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins and historical development of the comic and temporary Western culture’s two most popular genres. Consisting in some major works associated with Third World literature and film. Emphasis on African, Latin American, Caribbean, African-American, and Chicano literature. Cross-listed with FCC 173 (E-Z).

WRLT 180 (E-Z). Literature and Related Fields. (4) Lecture, three hours; extra reading, three 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. Examples may be drawn from fields such as political science, law, music, psychology, theatre, sociology, history, science, and philosophy. E. Literature and History; I. Literature and Institutions; L. Prewar Readings in Literature; M. Literature and Music; P. Literature and Psychology; S. Science and Literature; V. Literature and the Visual Arts; X. Literature and Marxism; Z. Literature and Fiction/Fantasy.

WRLT 181. Existentialism in Literature, Film, and Culture. (4) Lecture, three hours; scheduled screening, two hours; research paper, one-half hour; term paper, one-half hour. Prerequisite(s): upper-division standing or consent of instructor. Explores 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 FVC 181.

CPLT 184. Japanese Film and Visual Culture. (4) Lecture, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates popular visual culture in Japan primarily through film, from the early masters to contemporary directors. Additional material may be drawn from fields such as theatre, television, visual art, architecture, and illustrated fiction. All materials read or viewed in English. Course is repeatable to a maximum of 12 units. Cross-listed with AST 184, FVC 184, JPN 184.

WRLT 185. Modern and Contemporary Italian Literature in Translation. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Consideration of 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. Cross-listed with ITAL 185. Shapiro

WRLT 187. Metafiction. (4) Lecture, three hours; creative writing or term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the related functions of irony, laughter, violence, and sexuality. Hammer

CPLT 188 (E-Z). Studies in Comparative Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Studies of authors, literary works, and critical methodologies of importance. G. Genre: Confession and Autobiography.

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 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 212. Introduction to Graduate Studies in Comparative Literature. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing. 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. Hammer

CPLT 213. Rhetoric and Argument in Ancient China and Greece. (4) Seminar, three hours; outside research, three 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. Hammer

CPLT 214. History of Criticism. (4) Lecture, three hours; individual study, three 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. Hammer

WRLT 215. The Classical Tradition. (4) Lecture, three hours; reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the history of literature and film. Emphasis on African, Latin American, and European cultures from the Renaissance to the present. Topics include literature, art, architecture, and politics. Cross-listed with CLA 114. Scanlon
LTLG 250. Colloquium in Literatures and Languages. (1-2) Description under Literatures and Languages.

CPLT 270. Poetics. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing. By considering the idea of "literature" in terms of "dis-course," an "archi-text" that includes not only formal structures but modes of usage and cultural codes, this course examines the concept most associated with the literary genre. Investigates ways and means by which genres, within different national cultural systems, produce meaning within the special norms and constraints that define them. Danow, Slussner

CPLT 271. Narratology and Comparative Stylistics. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing. Considers the development of a modern "rhetic" 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. Slussner

CPLT 272. Influence and Intertextuality. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing. Examines the genealogy of various narratives or structures that, through networks of textual influence, occur in different literary traditions. Course is repeatable as content changes.

CPLT 273. Literary Hermeneutics. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing; seniors may be admitted by consent of instructor. Discusses a wide variety of issues related to the understanding of language and literature, the exegesis of canonical texts, and the relationship between interpretation and ideology. Theoretical works on hermeneutics, literary works that present or theorize exegetical problems, are also included.

CPLT 274. Representation of Science in Literature. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing. Examines the interscience relations 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. Raphals, Slussner

CPLT 277. Seminar in Comparative Literature. (4) Seminar, three hours; consultation, one 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 285. Popular and Mass Cultures. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing. Examines, in a historically and culturally contextualized, the idea of "popular" and mass culture problems considered are audience and marketplace; technologies of production; "canons" and contexts of authority; "minor" artists and standards of literary value. Hamner, Slussner

CPLT 286. Interdisciplinary Studies. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing. Examines the idea of academic discipline. 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 trans-national and multi-disciplinary context. Course is repeatable as content changes. Hamner, Slussner

CPLT 290. Directed Studies. (1-6) Graduated Satisfactory (S) or No Credit (NC). Course is repeatable.


ITAL 139. The Divine Comedy. (4) Description under Italian.

RLST 120. The Bible, from Egypt to Exile. (4) Description under Religious Studies.


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. Graduated Satisfactory (S) or No Credit (NC). May be repeated quarterly until the qualifying examinations are completed.

CPLT 292. Concurrent Analytical Studies. (2) Research, six 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 topics.

CPLT 299. Research for Thesis or Dissertation. (1-12) Graduated Satisfactory (S) or No Credit (NC). Course is repeatable.

RELATED COURSES


ITAL 139. The Divine Comedy. (4) Description under Italian.

RLST 120. The Bible, from Egypt to Exile. (4) Description under Religious Studies.


FOREIGN LANGUAGES, LANGUAGE, AND LINGUISTICS

FRENCH

Subject abbreviation: FREN

Committee in Charge

Michelle E. Bloom, Ph.D. Comparative Literature and French
1. Language proficiency: FREN 101A, French Civilization Option or contact UCR's International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

French Literature Option
1. Language proficiency — 16 upper-division units of work in the French language distributed as follows:
   b) Eight (8) units of work in French literature
   c) Four (4) units in EUR 191
   d) Four (4) units from FREN 100 or FREN 104
   e) Twelve (12) units of electives, either in French civilization and French literature, or, with approval of the student's advisor, in courses outside the French program relating to French civilization (Related history courses are strongly recommended.)

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 for date and time. Transfer students who have taken college-level language courses cannot take the placement examination and should consult with their advisors. No college-level credit may be duplicated.

Minor
The department offers a 24-unit disciplinary minor in French.

Requirements for the minor are as follows:
1. FREN 101A, FREN 101B, FREN 101C
2. FREN 100

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies 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 coursework should apply to the department.

GRADUATE PROGRAMS
Master's Degree
The Master's program in French is 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, three hours; discussion, one hour. Prerequisite(s): none. 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. Truby

FREN 002. Elementary French. (4) F/W/S Lecture, three hours; discussion, one hour. Prerequisite(s): FREN 001. 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. Truby

FREN 003. Elementary French. (4) F/W/S Lecture, three hours; discussion, one hour. Prerequisite(s): FREN 002. 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. Truby

FREN 004. Intermediate French. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): FREN 003 or equivalent. Continued study of the grammatical structures of French; vocabulary building; development of reading and compositional skills. Classes conducted in French. Truby

FREN 009A. French for Reading Knowledge. (4) Lecture, three 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) Prerequisite(s): FREN 009A. Lecture, three hours. A specialized course developing the skill to translate from French into English. No previous knowledge of French is required.

FREN 010A. Accelerated French. (6) Lecture, four hours; discussion, two hours. Prerequisite(s): none. Accelerated study of French. FREN 010A and FREN 010B provide the equivalent to FREN 001, FREN 002, and FREN 003 including the four basic skills: listening, speaking, reading, and writing. Credit is awarded for only one of the FREN 001, FREN 002, and FREN 003 or FREN 010A and FREN 010B sequences.

FREN 010B. Accelerated French. (6) Lecture, four hours; discussion, two hours. Prerequisite(s): FREN 010A or equivalent. Accelerated study of French. FREN 010A and FREN 010B provide the equivalent to FREN 001, FREN 002, and FREN 003 including the four basic skills: listening, speaking, reading, and writing. Credit is awarded for only one of the FREN 001, FREN 002, and FREN 003 or FREN 010A and FREN 010B sequences.

FREN 010C. Accelerated French. (6) Lecture, four hours; discussion, two hours. Prerequisite(s): FREN 010B or FREN 003 or equivalent. Accelerated study of French. Focuses on reading and translation of academic materials in various disciplines. Credit is awarded for only one of FREN 010A or FREN 010C.

FREN 015A. Intermediate Conversation and Composition. (4) F/W/S Lecture; three hours; individual study, three 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. Truby

FREN 015B. Intermediate Conversation and Composition. (4) F/W/S Lecture; three hours; individual study, three 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. Truby

FREN 025. Conversation. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): FREN 004 or equivalent. Practice at the intermediate level in understanding and speaking everyday French.
FREN 030 (E-Z). Masterworks of French Literature in English Translation. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): none. Introduces students to major authors, works, and movements of French literature. French works are read in English translation; no knowledge of French is required. E. From the Eighteenth Century through the Twentieth Century: The Enlightenment to Existentialism. S. Short Fiction. Bloom

FREN 040 (E-Z). Themes in French Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): none. Detailed study of major themes in French literature of various periods. Lectures, readings, and papers will be in English. E. Crime and Transgression. Bloom

FREN 045. French Cinema. (4) Lecture, three hours; individual study, three hours; screening, two hours. Prerequisite(s): none. Masterpieces of French cinema. The historical evolution of French Cinema as an art form with emphasis on major themes and directors. Bloom

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, three hours; individual study, three 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. Truby

FREN 101A. Advanced Grammar and Stylistics. (4) F,W,S Lecture, three hours; individual study, three 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. Bloom, Shapiro, Truby

FREN 101B. Advanced Grammar and Stylistics. (4) F,W,S Lecture, three hours; individual study, three 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, and concession, and restriction. Bloom, Shapiro, Truby

FREN 101C. Advanced Grammar and Stylistics. (4) F,W,S Lecture, three hours; individual study, three hours. Prerequisite(s): FREN 101B. Designed to make students aware of the differences between English and French through translation. Topics include tense use, prepositions, word use, and syntax. Bloom, Shapiro, Truby

FREN 104. Phonetics. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): FREN 015A. A descriptive, normative, and contrastive analysis of the Phonetics of French. Emphasis on the learning of a good French pronunciation. Truby

FREN 109A. Main Currents in French Literature: Middle Ages and Renaissance. (4) Lecture, three hours; consultation, one 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. Bloom, Shapiro, Truby

FREN 109B. Main Currents in French Literature: Sixteenth and Eighteenth Centuries. (4) Lecture, three hours; consultation, one 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. Bloom, Shapiro, Truby

FREN 109C. Main Currents in French Literature: Nineteenth Century. (4) Lecture, three hours; consultation, one 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. Bloom, Shapiro, Truby

FREN 109D. Main Currents in French Literature: Twentieth Century. (4) Lecture, three hours; consultation, one 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. Bloom, Shapiro, Truby

FREN 109E. Main Currents in French Literature: Twentieth Century: 2. (4) Lecture, three hours; consultation, one 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. Bloom, Shapiro, Truby


FREN 122 (E-Z). Gender in French Studies. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): comprehension of written and spoken French or consent of instructor. Examination of questions of gender in French culture and literature: the ways in which sexual difference affects such matters as writing style, the depiction of characters in literature and film, cultural behavior, and accomplishments in the arts. E. French Feminist Studies. G. Men Writing Women and Women Writing Men.

FREN 143. France and Asia in Literature and the Arts. (4) Lecture, three hours; screening, twenty hours per quarter; term paper, one 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 CPT 143.

FREN 145. Survey of Medieval Literature. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): comprehension of written and spoken French. An overview of medieval French literature through the reading of representative texts in the epic, romance, lyric, and dramatic tradition.

FREN 150 (E-Z). Francophone Studies. (4) Lecture, three hours; screening, one hour; term paper, one hour; outside research, one 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. W. Writing by and about Women.

FREN 155. Studies in the Renaissance: Baroque Art and Culture. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): comprehension of written and spoken French. The changing perception of the world, from the Renaissance to Classicism, as seen in art and literature of the baroque period. Poetry, drama, Montaigne’s Essays and French and Italian art will all provide material for the course.


FREN 181. Existentialism in Literature, Film, and Culture. (4) Lecture, three hours; scheduled screening, two hours; research paper, one-half hour; term paper, one-half hour. 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 FVC 181 and WRIT 181.

FREN 182. Francophone Literature in Translation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines major postcolonial literary works of the “Francophone.” Emphasis on the relation to the metropolis, immigration issues, polyglotism, race, class, and gender issues. Gugelberger, Shapiro

FREN 183. North African Fiction in French in Translation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines major works of Maghrebian and Bear writers using the French texts in translation. Emphasis on colonialism, postcolonialism, Islam, bilin-gualism, and gender issues. No knowledge of French is required. Gugelberger, Shapiro

FREN 184. Twentieth Century French Novel in Translation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Major works of twentieth-century French novelists including Proust, Gide, Sartre, Camus, Robbe-Grillet, Sarraste, Duras, and others. Emphasis on modernism, existentialism, and the French New Novel. Bloom, Shapiro

FREN 185. The Twentieth Century Novel. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): upper-division standing. From Proust to the present, including Existentialism and the New Novel. Texts in French for French majors, translated in English for non-French readers. Bloom, Shapiro

FREN 187. Theatre of the Twentieth Century. (4) Lecture, three hours; consultation, one 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. Bloom, Shapiro

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, one hour; individual study, three to nine 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. Bloom, Shapiro

GRADUATE COURSES

LTLG 250. Colloquium in Literatures and Languages. (1-2) Description under Literatures and Languages.

FREN 260. Seminar in French Civilization. (4) Seminar, three hours; outside reading, three hours. Prerequisite(s): graduate standing. Focus is on methodological and cultural history. Topics may vary. May be repeated for credit. Shapiro

FREN 263. Seminar in the Seventeenth Century. (4) Seminar, three hours; outside reading, three hours. Prerequisite(s): graduate standing. Intensive study of special topics in seventeenth-century literature and civilization. May be repeated for credit.
186 / Curricula and Courses

GERMANIC STUDIES

Subject abbreviation: GER

Committee in Charge

Reinhold Grimm, Ph.D. Comparative Literature and Germanic Studies
Georg M. Gugelberger, Ph.D. Comparative Literature
Stephanie B. Hammer, Ph.D. Comparative Literature and Germanic Studies
Sylvia Ochs, M.A. Germanic Studies
Heidi Waltz, Ph.D. Linguistics/Germanic Studies
Simone Yeomans, Ph.D. Germanic Studies
Patricia O’Brien, Ph.D. Dean, College of Humanities, Arts, and Social Sciences, ex officio

The Department of Comparative Literature and Languages offers a B.A. major and a minor in Germanic Studies.

Whether one thinks of philosophy, music, art, religion, or political and social history, Germanic culture has exercised a profound and often decisive influence on Europe. To aid students’ appreciation of these achievements, knowledge of German is a valuable asset.

In light of the role that Germany and all other German-speaking countries play within the European Union and worldwide, anyone interested in the study of art, literature, philosophy, history, and the sciences would profit from the Germanic Studies program. Apart from acquiring a reading, speaking, and writing knowledge of the German language, students of this program become familiarized with the great contributions of German poets and thinkers as they manifest themselves in the Germanic literatures and scientific research and are exposed to a wide range of customs in Germany, Austria, and Switzerland.

The Germanic Studies major and minor offer a diverse curriculum ranging from beginning language classes to advanced study of sophisticated literary and cultural topics.

The minor naturally complements liberal arts degrees in many areas, including History, Art History, Philosophy, Music, English, Business, and any area studies involving European aspects.

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 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.

Students are encouraged to consider opportunities for study in China or Taiwan 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. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

MAJOR

1. Lower-division requirements (16 units)

GER 001, GER 002, GER 003, GER 004, or equivalents

2. Upper-division requirements (44 units)

a) Sixteen (16) units from the following: GER 100, GER 101, GER 103A, GER 103B, GER 108

b) Twenty-eight (28) units as follows:

(1) Sixteen (16) upper-division units in German literature beyond the language proficiency requirement
(2) Four (4) units from GER 118 (E-Z)
(3) LING 111
(4) Four (4) units outside the Germanic Studies program but related to the major from the following: PHIL 121S, PHIL 1220, PHIL 122N, HISE 141, HISE 142, HISE 145, HISE 146, HISE 161, HISE 162 (or any other course related to the major, with approval of the student’s advisor)

Minor

1. Lower-division requirements (16 units)

GER 001, GER 002, GER 003, GER 004, or equivalents

2. Upper-division requirements (28 units)

a) Sixteen (16) units from the following: GER 100, GER 101, GER 103A, GER 103B, GER 108

b) 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 Undergraduate Studies section of this catalog for additional information on minors.

Honor’s 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 are expected to demonstrate superior capacity for independent study and during the senior year are required write an individually directed senior thesis.

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 for date and time. Transfer students who have taken college-level language courses cannot take the examination and should consult with their advisors. No college-level credit may be duplicated.

GRADUATE PROGRAMS

Master’s Degree

The Master’s program in German Studies is not currently accepting new students.

PROFESSIONAL COURSES

LTLG 301. Teaching of Foreign Language at the College Level. (4) Description under Literatures and Languages.

FREN 302. Teaching Practicum. (1-4) Practicum, four to eight hours; discussion, one hour. Prerequisite(s): consent of instructor; concurrent enrollment in FREN 100-series course. To be taken on an individual basis. Student will complete a graduate paper based on research related to the French 100-series course. May be repeated with different topic. FREN 100, FREN 104, 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.
Comparative Literature and Foreign Languages — Germanic Studies / 187

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, four hours. Prerequisite(s): none. An introduction to the sound system and grammar of German with attention to the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Audio-lingual materials available in the Media Study Center.

GER 001R. German for Reading Knowledge. (4) Lecture, four 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, four hours. Prerequisite(s): GER 001 or equivalent. An introduction to the sound system and grammar of German with attention to the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Audio-lingual materials available in the Media Study Center.

GER 002R. German for Reading Knowledge. (4) Lecture, four hours. Prerequisite(s): GER 001R or equivalent or consent of instructor. Second 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 required.

GER 003. Elementary German. (4) Lecture, four hours. Prerequisite(s): GER 002 or equivalent. An introduction to the sound system and grammar of German with attention to the development of the four skills: listening, speaking, reading, and writing. Classes conducted in German as much as possible. Audio-lingual materials available in the Media Study Center.

GER 004. Intermediate German. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): GER 003 or equivalent. Involves a grammar review combined with introductory readings of contemporary authors. Develops active language skills through readings, audiovisual media, and field trips. Credit is awarded for only one of GER 004 or GER 010C.

GER 010A. Accelerated German. (6) Lecture, four hours; discussion, two 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, four hours; discussion, two hours. Prerequisite(s): GER 010A or equivalent or consent of instructor. 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 010C. Accelerated German. (6) Lecture, four hours; discussion, two hours. Prerequisite(s): GER 010B or GER 003 or consent of instructor. Accelerated study of German. Focuses on academic materials in various disciplines and is equivalent to GER 004. Credit is awarded for only one of GER 004 or GER 010C.

GER 045. Introduction to German Cinema. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): none. Introduction to the history of German cinema from the advent of the studio system to the present. Film in Germany, Switzerland, and Austria is examined. Attention is also given to the work of German-speaking filmmakers living in other parts of the world. Given in English; all films are subtitled.

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

Course GER 100, its equivalent, or the consent of the instructor is the prerequisite for all upper-division courses, except GER 101, GER 103A, GER 103B, GER 121 (E-Z), and EUR 112A, EUR 112B, EUR 112C.

GER 100. Introduction to German Literature. (4) Lecture, three hours; consultation, one 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, four 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 with an emphasis on conversation. Ochs

GER 101A. Advanced Composition and Conversation. (4) Lecture, four hours. Prerequisite(s): GER 101 or consent of instructor. Ochs

GER 101B. Advanced Composition and Conversation. (4) Lecture, four hours. Prerequisite(s): GER 101 or consent of instructor. Ochs

GER 108. The Art of Translation. (4) Lecture, one hour; discussion, three hours. Prerequisite(s): GER 103B or equivalent. The examination of theories of translation including recognized examples of good and bad translations. Provides opportunity to put theory into practice. Grimm

GER 109A. Masterworks of German Literature in Translation: Middle Ages to the Age of Goethe. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing. Provides an introduction to the great contribution of German letters to world literature. Ochs

GER 109B. Masterworks of German Literature in Translation: Plays, Nineteenth Century Realism to the 1960s. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing. Provides an introduction to the great contribution of German letters to world literature. EUR 112A, EUR 112B, EUR 112C. Survey of Germanic Cultures and Institutions. (4, 4, 4) Description under Civilization.

GER 118 (E-Z). Topics in German Cinema. (4) Lecture, two hours; screening, one hour; other out-of-class preparation, four hours. Prerequisite(s): upper-division standing or consent of instructor. Study of selected films, directors, and/or movements in German film. Films are in German with English subtitles. No knowledge of German is required. Gugelberger

GER 121 (E-Z). Germanic Literature in Translation. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, one hour; written work, two 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 130. History of the German Language. (4) Lecture, three hours. Structural history from primitive Germanic to New High German.

GER 173. The Age of Goethe. (4) Lecture, three hours; outside research, three 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 181. Nineteenth-Century German Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. The development of German drama and literature from the Jungen Deutschland movement through Realism. Hammer

GER 185. Currents in Modern German Literature. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. Analysis and interpretation of such major modern writers as Brecht, Mann, and Kafka. Grimn

GER 190. Special Studies. (1-5) Tutorial, one to four 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, three hours. Prerequisite(s): upper-division standing. The topic varies from quarter to quarter. Course is repeatable to a maximum of 12 units.

GRADUATE COURSES

LTLG 250. Colloquium in Literatures and Languages. (1-2) Description under Literatures and Languages.

GER 268. Seminar in Twentieth-Century Literature. (4) Seminar, three hours. Special topics in twentieth-century literature. Topics may vary. Course is repeatable.

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) Graded Satisfactory (S) or No Credit (NC). 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) Research, six 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

LTG 301. Teaching of Foreign Language at the College Level. (4) Description under Literatures and Languages.

GER 302. Teaching Practicum. (1-4) Practicum, four to eight hours; discussion, one hour. Prerequisite(s): LTG 301 or equivalent; graduate standing; employment as Teaching Assistant or Associate. Supervised teaching in lower-division courses. Required of all teaching assistants in German. Graded Satisfactory (S) or No Credit (NC). May be repeated.

ITALIAN STUDIES

Subject abbreviation: ITAL

Committee in Charge
Steven E. Ostrow, Ph.D. (Art History)
Theda Shapiro, Ph.D. (French)
Nicoletta Tinozi Mehrmand, Ph.D. (Italian Studies)
Marguerite R. Waller, Ph.D. (English/Women's Studies)
Patricia O'Brien, Ph.D. (Dean, College of Humanities, Arts, and Social Sciences, ex officio)

Students are encouraged to consider opportunities for study in China or Taiwan 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. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California's EAP Web site at www.ucmse.ucsb.edu or contact UCR's International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

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 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.

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 Eastern or European studies, including art history, history, philosophy, political science, and religious studies.

In addition to the requirements listed below, students must fulfill all minor requirements for the College of Humanities, Arts, and Social Sciences. See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog.

Requirements for the minor consist of 20 units, distributed as follows:
1. Eight (8) units of ITAL 101A and ITAL 101B
2. Eight (8) units chosen from among the following courses:
   a. EUR 119 (E-Z), ITAL 125 (E-Z), ITAL 139, ITAL 162, ITAL 185/WRT 185
   b. Four (4) units chosen from among the following courses:
      a) AHS 161, AHS 162, AHS 163, or AHS 172, FVC 173-L/CPLT 173-L, HISE 131
      b) Music: relevant courses with consent of advisor

With the consent of the advisor, another course may be substituted for this requirement as long as its content and the student's work have a suitable concentration on Italian themes.

LOWER-DIVISION COURSES

ITAL 001. Elementary Italian. (4) Lecture, three hours; discussion, one hour; laboratory, one 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. Mehrmand

ITAL 002. Elementary Italian. (4) Lecture, three hours; discussion, one hour; laboratory, one hour. Prerequisite(s): ITAL 001 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. Mehrmand

ITAL 003. Elementary Italian. (4) Lecture, three hours; discussion, one hour; laboratory, one hour. Prerequisite(s): ITAL 002 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. Mehrmand

ITAL 004. Intermediate Italian. (4) Lecture, three hours; discussion, one hour; laboratory, one hour. Prerequisite(s): ITAL 003 or equivalent. Continued study of the basic grammatical structures of Italian, with emphasis on competency in reading, writing, and speaking. Reading of varied materials, both literary and journalistic, dealing with contemporary Italy. Mehrmand

ITAL 045. Italian Cinema. (4) Lecture, one and one half hours; discussion, one and one half hours; screening, three hours. Prerequisite(s): none. Major works of the Italian cinema from Neo-Realism to the present, with emphasis on their historical evolution and their representation of major elements of Italian culture. No knowledge of Italian is required. Mehrmand

ITAL 047. Italian American: Voices and Visions. (4) Lecture, one and one half hours; discussion, one and one half hours; screening, two hours; written work, one hour. Prerequisite(s): none. An introduction to the American experience as seen through major works of both Italian American and Italian writers and filmmakers from the 1950s to the present. No knowledge of Italian is required. Mehrmand

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, three hours; laboratory, one hour; individual study, three hours. Prerequisite(s): ITAL 004 or equivalent. Advanced Italian grammar and conversation. Emphasis is on mastery of the subtleties of the language in conversation, reading, and writing.

ITAL 101B. Advanced Italian. (4) Lecture, three hours; laboratory, one hour; individual study, three 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 125 (E-Z). Studies in Italian Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ITAL 101A or consent of instructor. Selected topics in Italian literature, providing detailed study of subjects and periods which are especially important in Italian culture. Students must have good reading and comprehension ability in Italian. E. Postwar and Contemporary.

ITAL 139. The Divine Comedy. (4) Lecture, three hours; consultation, one 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 162. Contemporary Italian Women Writers in Translation. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ITAL 101A or consent of instructor. Study of works by contemporary Italian women writers from critical, cultural, and historical perspectives. No knowledge of Italian is required. Mehrmand, Shapiro

ITAL 185. Modern and Contemporary Italian Literature in Translation. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Considered 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. Cross-listed with WRT 185. Mehrmand, Shapiro

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-I. Directed Studies. (1-6) Description under Comparative Literature. 290-I. Italian

ITAL 292. Concurrent Analytical Studies. (2) Research, six hours. Prerequisite(s): consent of instruc-
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: WRIT 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, RUSN 124, RUSN 181 (E-Z)
3. Civilization requirements: 12 units from EUR 111A, EUR 111B, EUR 111C, EUR 111D, RUSN 150

In addition, 24 units are selected from RUSN 110 (E-Z), RUSN 140, RUSN 182 (E-Z), EUR 113 (E-Z), or appropriate courses in other programs, including linguistics, comparative literature, Russian history, economics, and political science. 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 150

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

LOWER-DIVISION COURSES

RUSN 001. Elementary Russian (Part I). (4) Lecture, four hours. Prerequisite(s): none. Part I of the Elementary Russian series. 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 001R. Elementary Russian for Reading Knowledge. (6) Lecture, four hours; discussion, one hour; outside research, three hours. Prerequisite(s): none. The first of an intensive two-quarter sequence in reading Russian expository prose in professional, scholarly, and scientific fields. The RUSN 001R and RUSN 002R sequence is equivalent to the RUSN 001, RUSN 002, and RUSN 003 sequence and qualifies the student for RUSN 004.

RUSN 002. Elementary Russian (Part II). (4) Lecture, four hours. Prerequisite(s): RUSN 001 or consent of instructor. Part II of the Elementary Russian series. See course description under RUSN 001.

RUSN 002R. Elementary Russian for Reading Knowledge. (6) Lecture, four hours; discussion, one hour; outside research, three hours. Prerequisite(s): RUSN 001R or consent of instructor. The second of an intensive two-quarter sequence in reading Russian expository prose in professional, scholarly, and scientific fields. The RUSN 001R and RUSN 002R sequence is equivalent to the RUSN 001, RUSN 002, and RUSN 003 sequence and qualifies the student for RUSN 004.

RUSN 003. Elementary Russian (Part III). (4) Lecture, four hours. Prerequisite(s): RUSN 002 or consent of instructor. Part III of the Elementary Russian series. See course description under RUSN 001.

RUSN 004. Intermediate Russian (Part I). (4) Lecture, four hours. Prerequisite(s): RUSN 003, RUSN 002R or consent of instructor. Part I of the Intermediate Russian series. A comprehensive review of the basic grammatical structures of Russian, as well as a study of irregular and idiomatic forms, vocabulary building, development of conversation and composition skills.

RUSN 005. Intermediate Russian (Part II). (4) Lecture, four hours. Prerequisite(s): RUSN 004 or consent of instructor. Part II of the Intermediate Russian series. See course description under RUSN 004.

RUSN 006. Intermediate Russian (Part III). (4) Lecture, four hours. Prerequisite(s): RUSN 005 or consent of instructor. Part III of the Intermediate Russian series. See course description under RUSN 004.

RUSN 027. Russian Conversation. (1) Discussion, one hour. Prerequisite(s): RUSN 001. Weekly discussion of topics of current interest, intended to develop and maintain basic conversational skills. To be taken on a Satisfactory (S) or No Credit (NC) basis only. May be repeated for a total of 6 units.

RUSN 045. Soviet Cinema. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. A survey of the Soviet cinema, beginning with the film innovations of the 1920’s and continuing with representative films from each of the ensuing periods of Soviet culture. All work done in English.

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, three hours; extra reading, three hours. Prerequisite(s): RUSN 006 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, two hours. Prerequisite(s): RUSN 006 or consent of instructor. Each segment will deal with a specific topic in Russian grammar at an advanced level. Tests 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, two hours. Prerequisite(s):
RUSN 005 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 12 units. Levin

RUSN 109A. Survey of Soviet Literature in Translation. (4) F Lecture, three hours; outside research, three 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. Danow

RUSN 109B. Survey of Russian Literature in Translation. (4) W Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative masterpieces of the late nineteenth 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, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to major literary figures and representative masterpieces of the Soviet period (1917-1991). Any course in the RUSN 109A, RUSN 109B, and RUSN 109C sequence may be taken independently. Danow

RUSN 110 (E-Z). Masters of Russian Literature. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Readings and discussion of the works of major Russian writers. Topic varies from quarter to quarter. Readings in Russian recommended for Russian majors; other students may read either in Russian or in translation. G. Gogol; N. Gnedich; I. Dostoevsky; J. Tolstoy; F. Pushkin.

EUR 113 (E-Z). Special Topics in Russian Civilization. (4) Description under Russian Civilization.

RUSN 120 (E-Z). Studies in Russian Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): RUSN 005 or consent of instructor. Analysis and discussion of representative works of Russian literature. Readings will be in Russian and will vary from quarter to quarter. F. Readings in Twentieth Century; G. Readings in Nineteenth Century.

RUSN 124. Great Russian Short Stories. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the Russian short story as refined and developed by Russia's greatest practitioners of this highly important literary form. Danow

RUSN 140. Soviet Science Fiction. (4) Lecture, three hours. Emphasis will be placed on the relationship of Soviet science fiction themes to the literature of Socialist Realism and as a means of expressing criticism of Soviet society. No knowledge of Russian is necessary.

RUSN 150. Introduction to Slavic Languages. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): LING 020 or RUSN 004 or consent of instructor. Survey of the principal stages and primary influences in the development of the Slavic languages. Levin

RUSN 181 (E-Z). Studies in Literature and Criticism. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. In-depth studies of specialized topics in Russian literature and Slavic literary theory. F. Contemporary Russian Literary Figures.

RUSN 182 (E-Z). Studies in Russian Grammar. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): RUSN 101 (E-Z) (8 units), LING 020 or RUSN 150, or consent of instructor. Topic, varying from quarter to quarter, in the field of history or grammar of Russian. E. Aspect Levin

RUSN 190. Special Studies. (1-5) To be taken with the consent of the chairmen of the department as a means of meeting special curricular problems. Course is repeatable.

RUSN 195. Senior Thesis. (1-4) Outside research, three to twelve 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.

CPLT 290R. Directed Studies. (1-4) Description under Comparative Literature. 290R: Russian.

RUSN 292. Concurrent Analytical Studies. (2) Research, six 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 105 may not be used for RUSN 292.

LTLG 301. Teaching of Foreign Language at the College Level. (4) Description under Literature and Languages.

RUSN 302. Teaching Practicum. (1-4) Practicum, four to eight hours; discussion, one hour. Prerequisite(s): LTLG 301 or equivalent; graduate standing; employment as Teaching Assistant or Associate. Supervised teaching in lower-division courses. Required of all teaching assistants in Russian. Graded Satisfactory (S) or No Credit (NC). May be repeated.

Committee in Charge
William W. Megenney, Ph.D. (Hispanic Studies)
Heidi Waltz, Ph.D. Linguistics/Germanic Studies
Yennu Wu, Ph.D. Asian Languages and Civilizations
Patricia O'Brien, Ph.D.
Dean, College of Humanities, Arts, and Social Sciences, ex officio

MAJOR
The B.A. in Language allows a student to specialize in two or three 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).

Students interested in a single language concentration should see individual language program listings in this catalog.

Two Foreign Languages Option
1. LING 020 and WRLT 015
2. Elementary and intermediate courses in languages one and two as required

3. Sixty-four (64) upper-division units distributed as follows:
   a) Language one — 28 units which must include the following minimums:
      (1) Sixteen (16) units in language
      (2) Twelve (12) units in literature and civilization
   b) Language two — 20 units which must include the following minimums:
      (1) Twelve (12) units in language
      (2) Eight (8) units in literature and civilization
   c) LING 111 — 4 units
   d) One other course in Linguistics — 4 units
   e) Eight (8) units of electives in any of the above-mentioned areas

Three Foreign Languages Option
1. LING 020 and WRLT 015
2. Elementary and intermediate courses in Language one, two, and three as required
3. Sixty-four (64) upper-division units distributed as follows:
   a) Language one — 20 units which must include the following minimums:
      (1) Twelve (12) units in language
      (2) Eight (8) units in literature and civilization
   b) Language two — 20 units which must include the following minimums:
      (1) Twelve (12) units in language
      (2) Eight (8) units in literature and civilization
   c) Language three — 12 units in language
   d) LING 111 — 4 units
   e) One other course in Linguistics — 4 units
   f) Four (4) units in electives from any of the above-mentioned areas

LITERATURES AND LANGUAGES

Subject abbreviation: LTLG

LTLG 250. Colloquium in Literatures and Languages. (1-2) Seminar, one hour. Lectures and discussions by faculty, visiting scholars and students in current research areas. Students meeting may take the course for 2 units. Students attending lecture and discussions may take the course for 1 unit. Graded Satisfactory (S) or No Credit (NC). Repeatable to a maximum of 12 units. May not count towards minimum unit requirement for degree.

GRADUATE COURSES

PROFESSIONAL COURSES
Linguistics

Subject abbreviation: LING

Committee in Charge
Eugene N. Anderson, Ph.D. (Anthropology)
Adalberto Aquirre, Jr., Ph.D. (Sociology)
Curt Burgess, Ph.D. (Psychology)
David B. Kronenfeld, Ph.D. (Anthropology)
William W. Megenney, Ph.D. (Hispanic Studies)
Erich Reck, Ph.D. (Philosophy)
Lawrence D. Rosenblum, Ph.D. (Psychology)
Melanie Sperling, Ph.D. (Education)
Stanley N. Stewart, Ph.D. (English)
Heidi Waltz, Ph.D. (Linguistics/Germanic Studies)
Howard K. Wettstein, Ph.D. (Philosophy)
Patricia O’Brien, 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 (biological), 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. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uaep.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

Requirements for the major are as follows:

1. LING 020
2. Twenty-four (24) upper-division units distributed as follows:
   a) LING 111, LING 121, LING 131, LING 141
   b) ANTH 123
   c) PHIL 132 or PSYC 135/HMVD 135
3. 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.)
4. 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

1. Linguistics requirement: LING 020, LING 111, LING 121, LING 141, LING 190, LING 191
2. Related courses requirement:
   a) ANTH 120, ANTH 123
   b) ENGL 112
   c) CS 008, CS 010, CS 012
   d) MATH 144
   e) PHIL 008 or PHIL 008H
   f) Additional courses as may be required by the Linguistics Committee

3. Language Requirement — study in at least two language areas:
   a) 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
   b) 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, three 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. Levine, Megenney, Waltz

LING 021. Grammar. (4) Lecture, three hours; consultation, one 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, three hours; laboratory, one hour; outside research, one hour; extra reading, one 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, three hours; discussion, one 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, three hours; seminar, one hour. Prerequisite(s): LING 020, LING 111 or LING 121. Studies word structure, the lexical component of language, allomorphy, types of morphemes, and inflectional and derivational morphology. Examines various theories of lexical/morphological organization in the brain. Examples are taken from English and other Indo-European languages. Levine

LING 141. Phonology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): LING 111. Introduc-
tion 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 160 (E-Z). Topics in Dynamic and Comparative Linguistics. (4) Lecture, three hours; discussion, one 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, three hours; outside research, three 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, three hours; consultation, one hour. Selected topics in language and linguistics. Course may be repeated for credit up to 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. The course will be graded on a Satisfactory (S) or No Credit (NC) basis and may be taken for a maximum of three quarters.

LING 195. Senior Thesis. (2-4) Thesis, six to twelve 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. Levin

LING 195H. Senior Honors Thesis. (2-4) Thesis, six to twelve 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. Levin

French (Comparative Literature and Foreign Languages)

FREN 104 (Phonetics)
FREN 220 (Reading of Old French Texts)

Germanic Studies (Comparative Literature and Foreign Languages)

GER 130 (History of the German Language)

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/HMDV 135 (Psycholinguistics)
PSYC 163/HMDV 163 (Cognitive Development)

Russian

RUSN 150 (Introduction to Slavic Languages)
RUSN 182 (E-Z) (Studies in Russian Grammar)
RUSN 183 (E-Z) (Studies in Slavic Languages)

Spanish

SPN 105 (Phonology of the Spanish Language)
SPN 106A, SPN 106B (Structure of the Spanish Language)
SPN 207 (History of the Spanish Language)

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 121 (Language and Speech Development and Disorders)
EDUC 201A (Theories and Processes of Reading)

English

ENGL 112 (History of the English Language)

French (Comparative Literature and Foreign Languages)

FREN 104 (Phonetics)
FREN 220 (Reading of Old French Texts)

Germanic Studies (Comparative Literature and Foreign Languages)

GER 130 (History of the German Language)

Mathematics

MATH 144 (Introduction to Set Theory)

Philosophy

PHIL 125 (Intermediate Logic)
PHIL 126 (Advanced Logic)
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RUSN 150 (Introduction to Slavic Languages)
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RUSN 183 (E-Z) (Studies in Slavic Languages)

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

Advising Office, A159 Bourns Hall
(909) 787-5651
engr.ucr.edu/progdept

Major

The B.S. degree in Computer Engineering is offered by the departments of Computer Science and Engineering and of Electrical Engineering. A program goal is to teach students to apply theoretical knowledge to design problems that arise in modern computer engineering practice, using structured design methodologies and state-of-the-art tools. It also provides students with the freedom to tailor their programs of study to match their goals of professional specialty by choosing from a broad array of technical electives. The major provides students with a broad understanding of the fundamental concepts in engineering, mathematics, science, and statistics. The major also emphasizes both oral and written communication throughout the curriculum. The required studies in elected areas of the humanities and social studies ensure that students will receive a well-rounded and balanced education. Specialized courses build on this foundation to provide Computer Engineering students with necessary tools and experience to understand, design, and use both general-purpose computer systems and embedded computers that form one component of some larger system. Extensive, relevant laboratory projects are integrated throughout the curriculum to provide students with hands-on experience with the use, design, and interfacing of computers, and to strengthen their understanding of scientific, logical, statistical and engineering principles. The college maintains a schedule of course offerings allowing timely completion of degrees, and ultimately, ensures the high-quality undergraduate education necessary for a student to progress to the M.S. and Ph.D. degree level and/or succeed in an industrial career. The Computer Engineering program 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 engr.ucr.edu/progdept.

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. See engr.ucr.edu/studentaffairs/registration.htm for details.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, The Marlan and Rosemary Bourns College of Engineering, in the Undergraduate Studies Section, for requirements that students must satisfy.

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 009A
2. PHYS 040A, PHYS 040B, PHYS 040C

Major Requirements

1. Lower-division requirements (67 units): a) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046 b) CS 010, CS 012, CS 014, CS 061 c) EE 001A, EE 011A, EE 001B d) PHYS 040A, PHYS 040B, PHYS 040C e) One course of 4 or more units in Chemistry to be selected in consultation with a faculty advisor.
2. Upper-division requirements (83 units minimum)
   a) MATH 112, MATH 113
   b) STAT 155
   c) CS 120A/EE 120A, CS 120B/EE 120B; one course from CS 122A or EE 128
   d) CS 141, CS 161, CS 180; one course from CS 153 or CS 160
   e) EE 100A, EE 100B, EE 110A, EE 110B, EE 141
   f) 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 121, CS 122A, CS 122B, CS 130, CS 135, CS 150, CS 152, CS 153, CS 160, CS 164, CS 165, CS 166, CS 168, CS 170, CS 171, CS 177, CS 179 (E-Z), CS 181, CS 183, CS 193
   EE 102, EE 105, EE 115, EE 128, EE 132, EE 144, EE 146, EE 150, EE 151, EE 152, EE 175A, EE 175B

The technical electives selected from f) 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 c)–e) listed previously.

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.

**Sample Program**

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tbody>
<tr>
<td>MATH 009A, MATH 009B</td>
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<td>MATH 009C</td>
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<td>CS 010, CS 012</td>
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<td>PHYS 040A, PHYS 040B</td>
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<tr>
<td>ENGL 001A, ENGL 001B, ENGL 001C</td>
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<td>4</td>
<td>4</td>
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<tr>
<td>Humanities/Social Sciences</td>
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<td>Chemistry Elective</td>
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<td><strong>Total Units</strong></td>
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<td>17</td>
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**Sophomore Year**

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<tbody>
<tr>
<td>MATH 010A, MATH 010B</td>
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<tr>
<td>MATH 046, MATH 112, MATH 113</td>
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<tr>
<td>CS 014, CS 141</td>
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<tr>
<td>EE 011A, EE 011B, EE 011C</td>
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<td>4</td>
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<tr>
<td>PHYS 040C</td>
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<td></td>
</tr>
<tr>
<td>Humanities/Social Sciences</td>
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<td>4</td>
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<tr>
<td>Biological Science Elective</td>
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<tr>
<td><strong>Total Units</strong></td>
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<td>16</td>
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**Junior Year**

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<tr>
<td>CS 061</td>
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<tr>
<td>CS 120A/EE 120A, CS 120B/EE 120B</td>
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<tr>
<td>EE 100A, EE 100B, EE 110A, EE 110B</td>
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<td>4</td>
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<tr>
<td>STAT 155</td>
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<tr>
<td>Humanities/Social Sciences</td>
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<td><strong>Total Units</strong></td>
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**Senior Year**

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<tbody>
<tr>
<td>CS 153 or CS 160, CS 161, CS 180</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>CS 122A or EE 128</td>
<td>4</td>
<td>5</td>
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<tr>
<td>EE 141</td>
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<td>Technical Electives</td>
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<td>Humanities/Social Sciences</td>
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<tr>
<td><strong>Total Units</strong></td>
<td>16 or 17</td>
<td>16</td>
</tr>
</tbody>
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**COMPUTER SCIENCE AND ENGINEERING**

**Subject abbreviation: CS**

Thomas H. Payne, Ph.D., Chair
Department Office, A310 Surge Building
(909) 787-5639, www.cs.ucr.edu

**Professors**

Laxmi Bhuyan, Ph.D.
Marek Chrobak, Ph.D.
Yu-Chin Hsu, Ph.D.
Tao Jiang, Ph.D.
Mart L. Møller, Ph.D.
Teodor C. Przymusinski, Ph.D.
Chinya Ravishankar, Ph.D.
Vassilis Tsotras, Ph.D.
Satish K. Tripathi, Ph.D. William R. Johnson, Jr., Family Chair in Engineering

**Professors Emeriti**

Yung-Chang Hong, Ph.D.
Lawrence L. Larmore, Ph.D.

**Associate Professors**

Brett D. Fleisch, Ph.D.
Dimitrios Gunopulos, Ph.D.
Walid Najjar, Ph.D.
Thomas H. Payne, Ph.D.
Frank N. Vahid, Ph.D.

**Assistant Professors**

Michalis Faloutsos, Ph.D.
Harru Hsieh, Ph.D.
Vasili Kalogerakis, Ph.D.
Eamonn Keogh, Ph.D.
Srikanta Krishnamurthy, Ph.D.
Stefano Lonardi, Ph.D.
Scott R. Tilley, Ph.D.

**Adjunct Associate Professor**

Halina Przymusinska, Ph.D.

**Cooperating Faculty**

Alexander Balandin, Ph.D. (Electrical Engineering)
Matthew J. Barth, Ph.D. (Electrical Engineering)
Gerardo Beni, Ph.D. (Electrical Engineering)
Bir Bhanu, Ph.D. (Electrical Engineering)
Ilya Dumer, Ph.D. (Electrical Engineering)
Jay A. Farrell, Ph.D. (Electrical Engineering)
Yingbo Hua, Ph.D. (Electrical Engineering)
Zheng Yuan Xu, Ph.D. (Electrical Engineering)

**MAJOR**

The Department of Computer Science and Engineering offers B.S. degrees in Computer Science and in Information Systems, and M.S. and Ph.D. degrees in Computer Science. These programs provide the basis for careers in research and development in the computer science field as well as technical and nontechnical related fields that depend on a working knowledge of computers.

The Computer Science major has been designed to provide the student with a broad background in science and humanities and to provide an understanding of fundamental principles of computing and modern computing technology. It prepares the student for professional work with computer systems as well as for graduate work in computer science.

The Information Systems major is designed for students who wish to combine a rigorous computer science curriculum with fundamental topics from management in a single degree. Graduates of the program would be well prepared for information technology careers that require both technical depth and management knowledge, including entrepreneurs in the high technology industry and technical managers.

The Intersegmental General Education Transfer Curriculum (IGETC) does not meet transfer requirements for Computer Science. Lower-division major preparation is stressed for transfer students.

All undergraduates in the College of Engineering must see an advisor at least annually. See engr.ucr.edu/studentaffairs/registration.htm for details.

**Degree Requirements**

**University Requirements**

See the Undergraduate Studies section for requirements that all students must satisfy.

**College Requirements**

See Degree Requirements, The Marlan and Rosemary Bourns College of Engineering, in the Undergraduate Studies Section, for requirements that students must satisfy.

The **Computer Science** major uses the following major requirements toward the satisfaction of some of the College's Natural Sciences and Mathematics breadth requirements.

1. MATH 009A
2. PHYS 040A, PHYS 040B, PHYS 040C

The **Information Systems** 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 009A
3. SOC 150

**B.S. in Computer Science**

**Major Requirements**

1. Lower-division requirements (55 units)
   a) MATH 009A, MATH 009B, MATH 009C, MATH 010A
   b) CS 010, CS 012, CS 014, CS 061
   c) PHYS 040A, PHYS 040B, PHYS 040C
   d) 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.)
   e) ENGL 01SC
2. Upper-division requirements (74 units minimum)
   a) MATH 112, MATH 113
   b) STAT 155
   c) CS 120A/EE 120A
   d) CS 141, CS 150, CS 152, CS 153, CS 161, CS 179 (E-Z)
   e) Two courses from MATH 046, MATH 120, MATH 125A, PHIL 124
   f) At least 24 units of technical electives to be chosen from an approved list of courses which currently includes MATH 120, MATH 135A, MATH 135B; CS 100, CS 121, CS 122A, CS 122B; CS 130, CS 133, CS 160, CS 164, CS 165, CS 166, CS 168, CS 170, CS 171, CS 177, CS 179 (E-Z) (4 units maximum), CS 180, CS 181, CS 183, CS 185, CS 195 (4 units maximum), CS 120B/EE 120B, EE 140. The technical electives selected must be distinct from those used to satisfy the requirements specified in 2.a)–e) above.

**B.S. in Information Systems**

**Major Requirements**

1. Lower-division requirements (48 units)
   a) MATH 009A, MATH 009B, MATH 009C, MATH 010A
   b) CS 010, CS 012, CS 014, CS 061
   c) ECON 002, ECON 003
   d) BSAD 020A, BSAD 020B
2. Upper-division requirements (89 units)
   a) MATH 112, MATH 113
   b) STAT 155
   c) CS 100, CS 141, CS 153, CS 164, CS 165, CS 166, CS 180
   d) BSAD 110, BSAD 121/STAT 121, BSAD 134/ECON 134, BSAD 170
   e) SOC 150
   f) 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.
   g) Sixteen (16) units of Business Administration technical electives, including at least 8 units of management information systems courses. These 16 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.

**Minor Requirements for the Minor in Computer Science are:**

1. Prerequisite courses:
   - CS 010, CS 012, CS 014, CS 061, MATH 009A, MATH 009B, MATH 009C
2. Core courses: CS 141, MATH 112
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) Only one quarter of any A-B sequence may be used.
   c) No course may be an upper-division requirement of the student’s major.

**Note** Any courses required for the minor may be taken on a Satisfactory (S)/No Credit (NC) basis only on approval of the dean. 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**

All applicants for graduate status in the Department of Computer Science and Engineering must supply GRE General Test scores prior to admission. 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. To be considered for admission, applicants must have a sound understanding of programming, data structures, and computer organization. The graduate committee may prescribe additional remedial course work beyond the requirements specified below for applicants admitted with deficiencies.

**Master’s Degree**

General requirements are listed in the Graduate Studies section of this catalog. Specific requirements for the M.S. in Computer Science consist of the satisfactory completion of the breadth requirement, the course requirements, attendance in the colloquium series, and the capstone experience (project or thesis).

**Specialty Areas** The department offers the following breadth courses and has active research programs in these specialty areas:

1. Algorithms and Theory of Computation
   - CS 215 (Theory of Computation)
   - CS 218 (Design and Analysis of Algorithms)
2. Computer Architecture
   - CS 203A (Advanced Computer Architecture)
3. Embedded Systems and Computer-Aided Design
   - CS 220 (Synthesis of Digital Systems)
4. Databases/Data Mining
   - CS 235 (Data Mining Techniques)
   - CS 236 (Database Management Systems)
5. Operating Systems
   - CS 202 (Advanced Operating Systems)
6. Networking
   - CS 204 (Advanced Computer Networks)
7. Software Engineering
   - CS 245 (Software Evolution)
8. Programming Languages/Compilers
   - CS 201 (Compiler Construction)
9. Artificial Intelligence
   - CS 205 (Artificial Intelligence)

**1. Breadth Requirements** All students must demonstrate breadth in Computer Science by passing approved breadth courses, with a grade of “B” or better, in four of the specialty areas listed above and selected according to the following scheme:

a) One approved breadth course from area 1
b) One approved breadth course from area 2 or area 3
c) Two additional approved breadth courses from areas 4–9 but not both from the same area
d) Normally, all four breadth courses are taken from this list of graduate lecture courses; however, at most one of these four may be an approved undergraduate lecture course.

A list of approved graduate and undergraduate breadth courses is available from the graduate secretary. Students may also petition to satisfy the breadth requirement in any area by passing a Ph.D. depth examination in that area or by demonstrating knowledge equivalent to the breadth requirement based on prior course work or other experience.

2. Mandatory enrollment in CS 287 (Colloquium in Computer Science) each quarter.

3. Course Requirements Students showing good performance in the program may petition to replace some of these course requirements by courses taken at other universities or in other departments at UCR. For students interested in interdisciplinary research, individual study programs can be approved.

a) Project Option A student pursuing the M.S. degree, non-thesis option, must complete a project and at least 44 units of approved courses. At least 28 of these 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, must complete a thesis and successfully defend it in an oral examination. To balance the additional workload, the course requirement is reduced to 36 units of approved courses. At least 20 of these 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.

4. 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 are expected to 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. (A copy of the report must be submitted to the Graduate Division.)

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.

Doctoral Degree

The course requirements for the Ph.D. degree include all of the requirements for the M.S. degree, thesis option, except for the master's thesis. Some course requirements may be waived at the discretion of the graduate committee for students holding the M.S. degree in Computer Science from other schools and who have taken equivalent courses. Additional requirements are as follows:

The Ph.D. program in Computer Science is divided into two stages. The first stage is the qualifying process, during which students must demonstrate the necessary intellectual ability and mastery of an appropriate body of knowledge to undertake a major independent research project in their chosen specialty area. More specifically, the student must demonstrate a broad understanding of the discipline (by completing the breadth requirement), significant depth of knowledge in the chosen specialty area (by further course work and successfully completing the written depth examination), and the ability to work independently under the guidance of a faculty member (through the directed study project that will be presented at the oral qualifying examination). Once all these requirements have been met, the student is advanced to candidacy and enters the second stage, which is devoted to independent research leading to the preparation and defense of the dissertation.

Students in the Ph.D. program must find a faculty member who will agree to supervise their research. This must be done before the start of their second year. They should then devote at least half their time to research and develop a plan for completing the qualifying process in consultation with their thesis advisor. The student must attain candidate status by the end of the seventh quarter following formal admission to the graduate program in Computer Science.

Written Qualifying Examination The student must pass a written depth examination, prepared by the respective cognizant faculty, in one of the specialty areas listed above. Depth examinations may be offered in specialty areas not listed above in response to student petitions, given sufficient faculty and student interest. The depth examination must be passed in no more than two attempts.

Oral Qualifying Examination The student must demonstrate research aptitude by undertaking a research study on some topic (typically a problem from the student's chosen research specialty that may be a promising area in which to conduct the dissertation research), under the guidance of the faculty advisor. The research must be presented to a qualifying committee, which is appointed by the Graduate Division. The committee evaluates the merits of the work and the student's aptitude for research. The work must represent significant progress toward original and publishable research. The student must complete this requirement in no more than two attempts.

Students advance to candidacy after they have completed all the course requirements described above and passed both the written depth examination and oral qualifying examination. These examinations are designed to test the student's knowledge of a chosen specialty area and to evaluate the student's ability to conduct research.

Dissertation and Final Oral Examination After advancement to candidacy, the student should focus on dissertation research. Satisfactory progress to the degree requires the student to present a formal thesis proposal to the dissertation committee and successfully defend it in an oral presentation within a year of advancement to candidacy. After satisfactory performance on the final oral examination, the dissertation committee recommends granting the Ph.D. degree.
site(s): CS 010 with a grade of “C-” or better; familiarity with C or C++ language. Structured and object-oriented programming in C++, emphasizing good programming principles and development of substantial programs. Topics include recursion, pointers, linked lists, abstract data types, and libraries. Also covers software engineering principles.

CS 014. Introduction to Data Structures and Algorithms. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 012 with a grade of “C-” or better; MATH 009A or MATH 09HC; proficiency in C++. Topics include basic data structures such as arrays, lists, stacks, and queues; dictionaries including binary search trees and hashing; priority queues (heaps); introductory analysis of algorithms; sorting algorithms; and object-oriented programming including abstract data types, inheritance, and polymorphism. Also covers solving complex problems through structured software development.

CS 020. Web Site Construction. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 010. An introduction to web site design, deployment, management, and evolution. Topics include creation; graphics and image processing; streaming multimedia; Dynamic HTML; SMIL; XML; Java and JavaScript; VB Script; DOM; World Wide Web Consortium; servers and applets; CGI; bandwidth; SSL; security and log files; electronic commerce; standards; user interfaces and human-computer interaction.

CS 061. Machine Organization and Assembly Language Programming. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 010. An introduction to computer architecture, to include the topics of binary, decimal, and hexadecimal numbering systems; register transfer and computer operations; computer instructions and addressing modes; memory organization; interrupt and trap processing; input/output (I/O) and communications; assembly language programming; basic data structures; assembler directives, macros, procedures, and system calls; high-level language interfaces; assemblers, linkers, and debuggers; and simulating high-level languages in assembly language.

UPPER-DIVISION COURSES

CS 100. Software Construction. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141. Development and construction of software products. Topics include: software life cycle, and implementation strategy; quality attributes; prototyping, reuse, and components; debugging, testing, and performance; integration and maintenance; documentation; standards, analysis, and selection of tools and environments; and personal software processes.

CS 120A. Logic Design. (5) Lecture; three hours; laboratory, six hours. Prerequisite(s): CS 061. 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, multiplexers, flip-flops, registers, and simple memories; state-machine design; and basic register-transfer-level design. Laboratories involve use of hardware description languages, synthesis tools, programmable logic, and significant hardware prototyping. Cross-listed with EE 120A.

CS 120B. Introduction to Embedded Systems. (5) Lecture, three hours; laboratory, eight 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 custom and programmable processor design, standard peripherals, memories, interfacing, and hardware/software tradeoffs. Laboratory involves use of synthesis tools, programmable logic, and microcontrollers and development of working embedded systems. Cross-listed with EE 120B.

CS 121. Rapid Prototyping of Digital Systems. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 120B/EE 120B. Top-down design methodology; hardware description languages; functional-level simulation; partitioning; high-level synthesis, finite state machine synthesis, logic synthesis, placement and routing, timing simulation, testing, rapid prototyping using field-programmable gate arrays.

CS 122A. Intermediate Embedded and Real-Time Systems. (5) Lecture, three hours; laboratory, six hours. Prerequisite(s): CS 120B/EE 120B. Covers software and hardware design of embedded computing systems. Topics include hardware and software co-design, 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, three hours; laboratory, six hours. Prerequisite(s): CS 122A. Further exploration of state-of-the-art aspects of building embedded systems, including real-time operating systems, embedded processors, microcontrollers, application-specific processors, hardware and software cosimulation and codegen, low-power design, reconfigurable computing, core-based design, and platform-based methodology.

CS 130. Computer Graphics. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141, MATH 113, or equivalents. 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 polylines, convex hulls, and voronoi diagrams.

CS 141. Intermediate Data Structures and Algorithms. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141, MATH 113 or equivalents. 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 polylines, convex hulls, and voronoi diagrams.

CS 143. Multimedia Technologies and Programming. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 010 or knowledge of an object-oriented or fourth-generation (scripting) programming language, for example C++, Hypertalk, Supertalk, Lingo, Openscript, ScriptX. Introduces multimedia technologies and programming techniques, multimedia hardware devices, authoring languages and environments, temporal and non-temporal media (interactivity in text, graphics, audio, video, and animation). Applications, and trends. A term project is required. Cross-listed with EE 143.

CS 150. The Theory of Automata and Formal Languages. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CS 014, MATH 112. A study of formal grammars, finite-state automata, Turing machines, time- and storage-bounded Turing machines, semantics of programming languages, elements of recursive function theory, and complexity of computation.

CS 152. Compiler Design. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 061, CS 141. Covers the fundamentals of compiler design, including lexical analysis, parsing, semantic analysis, and compile-time memory organization, run-time memory organization, code generation, and compiler portability issues. Laboratory work involves exercises covering various aspects of compilers.

CS 153. Design of Operating Systems. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 060 or fourth generation language, and database management systems. Principles and practice of operating system design, including concurrency, memory management, file systems, protection, security, command languages, scheduling, and system management. Laboratory work involves exercises covering various aspects of operating systems.

CS 160. Concurrent Programming and Parallel Systems. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 061, CS 141. Study of concurrent and parallel systems. Topics include modular structure and design, interprocess communication, synchronization, failures and persistence, concurrency control, atomic transactions, recovery, deadlock, and resource management. The laboratory component includes the design of a microprocessor using a hardware description language.

CS 162. Computer Architecture. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 161 with a grade 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, and parallel processing. A laboratory component includes simulation of processor design.

CS 164. Computer Networks. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141. Fundamentals of computer networks. Topics include layered network architecture, communication protocols, local area networks, UNIX network programming, verification, and performance studies.

CS 165. Computer Security. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141. Computer and network security. Topics include security attacks, firewalls, and password protection; privacy issues, firewalls, and spoofing. Covers very long instruction word (VLIW) processing, multimedia support, design of network and embedded processors, and parallel processing. A laboratory component includes simulation of processor design.

CS 166. Database Management Systems. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141. Topics include architecture of database management systems, relational, network, and hierarchical models, distributed database concepts, query languages, and query security of the database.

CS 168. Introduction to Very Large Scale Integration (VLSI) Design. (5) Lecture, three hours; laboratory, six hours. Prerequisite(s): CS 120A/EE 120A or consent of instructor. Basic electrical properties of metal-oxide-semiconductor (MOS) circuits. MOS circuit design

CS 170. Introduction to Artificial Intelligence. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141. Introduction to fundamental problems underlying the design of intelligent systems and to one of the languages of artificial intelligence such as Prolog or LISP. Topics include 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, three hours; discussion, one 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, three hours; laboratory, three hours. Prerequisite(s): CS 141, C++ programming proficiency. Topics include validation and verification of models; concepts in modeling and simulation analysis; and conceptual models and their mathematical and computer realizations. Examines simulation modeling techniques including object-oriented modeling and discrete-event modeling. Emphasis is on the use of simulation libraries used with programming languages such as C++. Requires a term project consisting of the development, computer implementation, and analysis of a model.

CS 179 (E-Z). Project in Computer Science. (4) Discussion, one hour; laboratory, nine hours. Prerequisite(s): CS 141 with a grade of "C-" or better, 12 additional upper-division units in Computer Science. Additional prerequisites may be required for some segments of this course; see department. Under the direction of a faculty member, students (individually or in small teams with shared responsibilities) propose, design, build, test, and document software and/or hardware devices or systems. Requires a written report, giving details of the project and test results, and an oral presentation of the design aspects. Emphasizes teamwork, making technical presentations, and developing oral and written communication skills.

CS 180. Introduction to Software Engineering. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141. 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, three hours; laboratory, three hours. Prerequisite(s): CS 061, CS 141 (CS 141 may be taken concurrently). CS 150. Principles of programming language design. Study and comparison of several programming languages, their features, and their implementations.

CS 183. UNIX System Administration. (4) Seminar, three hours; laboratory, three hours. Prerequisite(s): CS 141. 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 185. Commercial Software Development. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 141. Topics include software design, development, testing, documentation, maintenance, marketing, and production, with an emphasis on the economic impact of decisions in the development phase. Also examines software piracy, copyrights, patents, and similar issues. Students develop, test, and market a commercial-quality piece of software.

CS 190. Special Studies. (1-5) Individual study, three to fifteen 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 191 (E-Z). Seminar in Computer Science. (1-4) Prerequisite(s): consent of instructor. Consideration of current topics in computer science.

CS 193. Design Project. (1-4) Laboratory, one to six hours; scheduled research, one to three hours; individual study, one to three hours. Prerequisite(s): CS 141; consent of instructor. Individual hardware or software design project to include establishment of objectives and criteria, synthesis, analysis, 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 198-1. Individual Internship in Computer Science. (1-4) Internship, three units; seminar, one unit; outside research, three units. Prerequisite(s): CS 141 or consent of instructor. 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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable up to a maximum of 8 units.

CS 201. Compiler Construction. (4) Lecture, three hours; research, three hours. Prerequisite(s): CS 152. Theory of parsing and translation. Compiler construction, including lexical analysis, syntax analysis, code generation and optimization.

CS 202. Advanced Operating Systems. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): CS 153. Recent developments in operating systems. Multiprogramming, parallel programming, time sharing, scheduling and resource allocation, and selected topics.

CS 203A. Advanced Computer Architecture. (4) Lecture, three hours; scheduled research, three 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.

CS 203B. Advanced Computer Architecture. (4) Lecture, three hours; scheduled research, three 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; very-long-instruction-word, explicitly parallel instruction computing, and multithreaded architectures; dataflow machines; and vector and single instruction multiple data architectures, including multimedia extensions. Also discusses network processors, multimedia processors, and advanced embedded processors.

CS 204. Advanced Computer Networks. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): CS 014, CS 164. Advanced topics in computer networks, layering, Integrated Services Digital Networks (ISDN), high-speed networks, performance models and analysis, distributed systems and databases, case studies.

CS 205. Artificial Intelligence. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CS 170 or equivalent. Knowledge representation and automated reasoning and their use in capturing common sense and expert knowledge. Predicate and nonmonotonic logics. Resolution and term rewriting. Reasoning under uncertainty. Theorem provers, planning systems, and belief networks. Special topics include natural language processing, perception, logic programming, expert systems, deductive databases.

CS 213. Parallel and Distributed Processing. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CS 161 or equivalent. Parallel programming languages. Pipelining and supercomputing. Multiprocessing control, scheduling, and algorithms. Dataflow computing including models of computation, languages, and architectures. Very large scale integration (VLSI) computing structures including systolic/wavefront array processors, mapping algorithms, and reconfigurable processor arrays.


CS 218. Design and Analysis of Algorithms. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): CS 014, MATH 131. 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. Worst-case and average-case analysis using recurrence relations, generating functions and other methods. Upper and lower bounds.

CS 220. Synthesis of Digital Systems. (4) Lecture, three hours; scheduled research, three hours. Prerequisite(s): CS 161. Covers the synthesis and simulation of digital systems. Topics include structural synthesis at the system, behavioral, register-transfer, and logic levels; application-specific processors; simulation; and emerging system-on-a-chip design methodologies.

CS 235. Data Mining Techniques. (4) Lecture, three hours; term paper, one and a half hours; project, one and a half 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. Topics include clustering, classification, association rules mining, time series clustering, and Web mining.

CS 236. Database Management Systems. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): CS 014, CS 153 or equivalent, CS 166; or consent of instructor. Principles and systems architecture of database management systems, data models, relational databases, logical and physical design of databases, hardware and software implementation of database systems, distributed databases (query processing, concurrency, recovery).

CS 237. Advanced Topics in Modeling and Simulation. (4) Lecture, three hours; scheduled research, three hours. Prerequisite(s): CS 177. Formal computer simulation models, such as Discrete Event Specified Models and differential equation models. Current developments in simulation languages. Integrated model development and applications to complex, large-scale problems.

CS 238. Algorithmic Techniques in Computational Biology. (4) Lecture, three hours; scheduled research, three hours. Prerequisite(s): CS 141 or CS 218; MATH 112. Study of fundamental algorithms for solving combinatorial or computational problems in molecular biology and genomics. Topics include sequence alignment and multiple alignment, bio-database search, gene and regulatory signal recognition, DNA sequence assembly, physical mapping, and reconstruction of evolutionary trees.

CS 239. Performance Evaluation of Computer Networks. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): CS 164. Offers models and analytical techniques for evaluating the performance of computer networks. Covers basic and intermediate queueing theory and queuing networks and their application to practical systems.
CS 245. Software Evolution. (4) Lecture, three hours; scheduled research, three hours. Prerequisite(s): CS 180 or equivalent; graduate standing. Covers the principles, tools, and techniques for disciplined software evolution. Topics include migration strategies, change patterns, software maintenance, legacy system reengineering, reverse engineering for program understanding, middleware, source code analysis, software visualization, and program transformation.

CS 260. Seminar in Computer Science. (1-4) Seminar, one to four hours. Prerequisite(s): consent of department. Seminar on current research topics in Computer Science. Course is repeatable.

CS 261. Seminar in Artificial Intelligence and the Design of Expert Systems. (4) Seminar, four hours. Prerequisite(s): graduate standing or consent of instructor. A review of recent research topics in the fields of artificial intelligence and logic programming with a particular emphasis on expert systems, automated reasoning, and knowledge representation.

CS 262. Algorithms and Data Structures. (4) Seminar, four hours. Prerequisite(s): CS 218, CS 215A, or consent of instructor. Selected topics in theoretical computer science. Course is repeatable.

CS 263. Seminar in Distributed Systems. (4) Seminar, four hours. Prerequisite(s): graduate standing; CS 153 or previous operating systems course. A project-oriented course that introduces students to the fundamental topics in distributed computer systems and provides practical experience. Topics include distributed file systems, replicated data, load management, and distributed shared memory.

CS 265. Seminar in Parallel Computer Architectures. (4) Seminar, four hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the problems of building a general purpose, massively parallel architecture. Discusses proposed solutions to the problems of massively parallel architectures, including implementation and compilation. Covers the recent progress made in the field.

CS 267. Seminar in Databases. (4) Seminar, four hours. Prerequisite(s): CS 236 or consent of instructor. Focuses on recent research and development issues in the database area such as object-oriented databases, heterogeneous databases, parallel databases, benchmarking, transaction processing, query optimization, and performance evaluation.

CS 268. Seminar in Computer-Aided Design and Design Automation. (4) Seminar, four hours. Prerequisite(s): graduate standing or consent of instructor. Emphasizes recent research in automatic synthesis of digital systems. Covers recent progress and results in the design synthesis of digital systems in the systems level, register transfer level, logic design level, and physical design.

CS 269. Software and Hardware Engineering of Embedded Systems. (4) Seminar, four 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 specific models, languages, simulation, partitioning algorithms, estimation methods, model refinement, and design methodology.

CS 287. Colloquium in Computer Science. (1) Colloquium, one 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, one to six 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. (1-4) Individual study; three to eighteen hours. Prerequisite(s): graduate standing. Directed research on selected problems in computer science under the sponsorship of specific faculty members. Graded Satisfactory (S) or No Credit (NC).

CS 298-I. Individual Internship. (1-12) Written work, one to twelve hours; internship, two to twenty-four hours. Prerequisite(s): graduate standing; consent of instructor. Individual apprenticeship in computer science. Includes fieldwork 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.

CS 299. Research for Thesis or Dissertation. (1-12) Individual study, three to thirty-six 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 thesis 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, one 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, one to four 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

Program Office, 1001 Batchelor Hall North
(909) 787-4186
cnas.ucr.edu/~consbio/CBioHP.html

The major in Conservation Biology is not currently accepting new students. Students who are interested in this field should see the Conservation Biology track, in the Biological Sciences section of this catalog. For more information contact the Biological Sciences Undergraduate Advising Center, (909) 787-4186.

Students currently working toward the B.S. degree in Conservation Biology (as well as readmitted students and transfer students accepted prior to Fall 2004) will be allowed to complete the degree requirements but must graduate by Summer 2006. For a listing of degree requirements consult the 2001-2002 UCR General Catalog.

UPPER-DIVISION COURSES

BLCN 190. Special Studies. (1-4) Individual study, three to twelve 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 193. Senior Seminar. (4) Seminar, four hours. Prerequisite(s): senior standing in Conservation Biology or consent of instructor. A synthesis course which integrates previous upper-division course work by investigating current research topics in conservation biology in a seminar and discussion format. Includes presentations by faculty, students, and invited speakers. Graded Satisfactory (S) or No Credit (NC).

BLCN 197. Research for Undergraduates. (1-2) Research, three to six 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, six to twelve hours; consultation, one hour; outside reading, two to four 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, three to twelve 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

Maurya Simon, M.F.A., Chair
Department Office, 1607 Humanities and Social Sciences
(909) 787-2414
creativewriting.ucr.edu

Professors
Christopher Buckley, M.F.A.
Maurya Simon, M.F.A.
Susan C. Straight, M.F.A.

Professors Emeriti
Eliud Martínez, Ph.D.
Stephen Minot, M.A.

Visiting Associate Professor
Cristina Garcia, M.A.

Lecturers
Judy Z. Kronenfeld, Ph.D.
Frances H. McConnel, 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 major consists of 12 units of lower-division courses and 60 units of upper-division courses, including 24 units of concentration in a subject of student choice approved by the Creative Writing Chair or advisor.

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.

**Degree Requirements**

**University Requirements**

See the Undergraduate Studies section for requirements that all students must satisfy.

**College Requirements**

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

**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 (12 units)**
   
   Three lower-division literature surveys:
   - ENGL 014 (Major American Writers)
   - ENGL 015 (Modern Literature)
   - ENGL 023A-ENGL 023B-ENGL 023C (English Literary Traditions)
   - ENGL 031 (American Literary Traditions)
   - ENGL 032 (Twentieth-Century Literature)

2. **Upper-division requirements (60 units)**
   
   a) Three workshop courses in genre of interest
      - Poetry
      - CRWT 150 (Beginning Poetry Workshop)
      - CRWT 160 (Intermediate Poetry Workshop)
      - CRWT 170 (Advanced Poetry Workshop)
   
   or Fiction
      - CRWT 152 (Beginning Fiction Workshop)
      - CRWT 162 (Intermediate Fiction Workshop)
      - CRWT 172 (Advanced Fiction Workshop)
   
   b) One workshop in second genre:
      - CRWT 150, CRWT 152, CRWT 160, CRWT 162, CRWT 164A/THAE 164A, CRWT 164B/THAE 164B, or the CRWT 166A/FVC 166A/THAE 166A, CRWT 166B/FVC 166B/THAE 166B, CRWT 166C/FVC 166C/THAE 166C series
   
   c) Three upper-division courses in Creative Writing:
      - CRWT 171 (Anatomy of Poetry)
      - CRWT 187/WRT 187 (Metaphiction)
      - CRWT 176 (E-Z) (Special Topics)
   
   d) One upper-division course in Art, History, Music, Dance, or Theatre
   
   e) Four (4) units of CRWT 195H Senior Thesis, or approved course
   
   f) Six upper-division courses of concentration in another discipline or set of disciplines approved by advisor

**Minor**

1. **Lower-division requirements (8 units)**
   
   a) One introductory writing workshop:
      - CRWT 056
   
   b) One introductory reading course:
      - CRWT 040, CRWT 041, CRWT 042, or CRWT 043
   
   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 101G, FREN 104; 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:
      - **Poetry Emphasis**
         - (1) CRWT 150, CRWT 160, CRWT 170
         - (2) Four (4) units from CRWT 162, CRWT 165, CRWT 166A/FVC 166A/THAE 166A, CRWT 171, CRWT 187/WRT 187
      - **Fiction Emphasis**
         - (1) CRWT 152, CRWT 162, CRWT 172
         - (2) Four (4) units from CRWT 160, CRWT 164A/THAE 164A, CRWT 165, CRWT 166A/FVC 166A/THAE 166A, CRWT 187/WRT 187
      - **Drama Emphasis**
         - (1) CRWT 164A/THAE 164A, CRWT 164B/THAE 164B, CRWT 164C/THAE 164C
         - (2) Four (4) units from CRWT 160, CRWT 162, CRWT 165, CRWT 166A/FVC 166A/THAE 166A, CRWT 166B/FVC 166B/THAE 166B, CRWT 166C/FVC 166C/THAE 166C, CRWT 187/WRT 187, THAE 121 (E-Z)

   See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

**GRADUATE PROGRAM**

See Creative Writing and Writing for the Performing Arts in this catalog for information on the M.E.A. in this area.

**LOWER-DIVISION COURSES**

CRWT 040. Fiction and Film. (4) Lecture, three hours; practice writing, three hours. Prerequisite(s): none. A study of twentieth-century international fiction and film from a writer’s point of view, emphasizing relationships and literary techniques found in both. Explores what is required to move from the novelistic to the cinematic.

CRWT 041. Poetry and Fiction: A Reading Course for Writers. (4) Lecture, three hours; creative imitation practice, three 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, three hours; extra reading, three hours. Prerequisite(s): none. Explores personal experience and ancestry. Genres studied may include nonfiction, autobiography, fiction, and visual media. Students compose imitations and may also write analytical essays based on the models studied.

CRWT 043. Creative Writing and Ancestry. (4) Lecture, three hours; outside writing, three 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 056. Introduction to Creative Writing. (4) Practice writing, three hours; workshop, three hours. Prerequisite(s): ENGL 001A. Introduction to the writing of imaginative literature, with primary emphasis on the short story and poetry. Enrollment limited.

CRWT 066. Screenwriting: An Introduction and Survey. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. Introduces screenwriting and the ways in which screenplays impact society. Examines a wide range of films, from early silent films to modern mini-series, hour-long dramas, sitcoms, and animation productions. Cross-listed with FVC 066 and THAE 066.

**Education Abroad Program**

The Creative Writing program encourages students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uueap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.
CRWT 097H. Freshman Honors Project: Poetry. (4) Seminar, three hours; individual study, one hour; extra reading, one hour; creative projects, two hours. Prerequisite(s): Admission to the University Honors Program or consent of instructor. A course in poetry writing involving the reading of poetry and comments of poetry and critics on poetry in modern and contemporary modes. Designed to foster students’ exploration of the diversity of poetic styles, periods with no dominant school, and their awareness of the aesthetic, cultural, and personal resonances of conscious and unconscious artistic choices.

CRWT 130. Beginning Creative Nonfiction. (4) Workshop, three hours; extra reading, three hours. Prerequisite(s): CRWT 056 or consent of instructor. Introduction to creative nonfiction. Covers its history and strategies for writing and critically evaluating creative nonfiction essays. Includes reading in current nonfiction, but focuses on writing creative nonfiction essays based primarily on personal experience. Course is repeatable to a maximum of 8 units.

CRWT 132. Intermediate Creative Nonfiction. (4) Workshop, three hours; written work, three 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 essay, history, and investigative writing. Course is repeatable to a maximum of 8 units.

CRWT 134. Advanced Creative Nonfiction. (4) Workshop, three hours; written work, three hours. Prerequisite(s): CRWT 056, CRWT 130, CRWT 132; or consent of instructor. Explores strategies for writing and critically evaluating creative nonfiction essays. Focuses primarily on memoir, personal essay, history, and investigative 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 146 (E-Z). Special Topics: Fiction. (4) Seminar, three hours; workshop, three hours; extra reading, three hours. Prerequisite(s): CRWT 056 or consent of instructor. Explores specific topics of style and craft in fiction. E. Minimalism: Hemingway to Garver and Beyond; F. Magical Realism and Surrealism, Past and Present; G. Genre Fiction and Styles: Potential for Legitimacy. Course is repeatable.

CRWT 150. Beginning Poetry Workshop. (4) Workshop, research, three hours. Prerequisite(s): CRWT 056 or consent of instructor. Students write poetry which is analyzed by the class. Stylus original work and outside reading are required.

CRWT 151. Sports Journalism. (4) Lecture, three hours; interviewing and writing, three 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, research, three hours. Prerequisite(s): CRWT 056 or consent of instructor. Students discuss and analyze outside texts and original work from the class. Substantial original work is required.

CRWT 160. Intermediate Poetry Workshop. (4) Workshop, three hours; research, two 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, three hours; outside research, three 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, three hours; discussion, one hour. Prerequisite(s): THEA 100 or CRWT 056 or consent of instructor. Seminar in the practice of playwriting with the construction of a plot. Cross-listed with THEA 164A. Morton

CRWT 164B. Intermediate Playwriting. (4) Seminar, three hours; discussion, one 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. Morton

CRWT 164C. Advanced Playwriting. (4) Seminar, three hours; discussion, one 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. Morton

CRWT 165. Fundamentals and Concepts of Journalism. (4) Lecture, three hours; consultation, one hour. Introduction to the journalistic writing process, including history, role in modern society, function and form, editing principles, ethics and legalities. Writing assignments will provide experience in interviewing, story construction and organization, format options and variations in style.

CRWT 166A. Screenwriting: Introduction. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): CRWT 056 or consent of instructor. Explores the fundamentals of screenwriting including story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Cross-listed with FVC 166A/THEA 166A.

CRWT 166B. Screenwriting: Outline to First Draft. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): CRWT 166A/FVC 166A/THEA 166A or consent of instructor. Explores the fundamentals of screenwriting including story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Cross-listed with FVC 166B/THEA 166B.

CRWT 166C. Screenwriting: Rewrites and Writing for Television. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): CRWT 166B/FVC 166B/THEA 166B or consent of instructor. Explores the fundamentals of screenwriting including 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 FVC 166C/THEA 166C.

CRWT 167A. Plays in Production. (4) Workshop, eight hours. Prerequisite(s): CRWT 164A/THEA 164A or CRWT 166A/FVC 166A/THEA 166A or consent of instructor. Development and preproduction of half-hour or one-hour plays written specifically for stage, soundstage, radio, television, or Web-based broadcasting. Students learn the basics of sound and video production to enhance their 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, eight 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 THEA 165B.

CRWT 170. Advanced Poetry Workshop. (4) Workshop, three hours; outside research, three hours. Prerequisite(s): 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, three hours; creative writing, three hours. Prerequisite(s): CRWT 160 or consent of instructor. An introductory study of poems, including traditional and contemporary forms. Students write in the various poetic forms studied.

CRWT 172. Advanced Fiction Workshop. (4) Workshop, three hours; outside research, three 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 175. Advanced Writing for Journalists. (4) Lecture, three hours; discussion, one 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, three hours; extra reading, one hour; practice writing, two to three 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 187. Metafiction. (4) Lecture, three hours; creative writing or term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Postmodernism, metafiction, and the new novel in Europe and America. Creative writers submit fiction in lieu of a term paper. Cross-listed with WRIT 187.

CRWT 189. ArtsBridge. (1-4) Workshop, five hours per quarter; consultation, five hours per quarter; extra preparation or extra reading, three hours per week; field work, one and half hours to six hours per week. Prerequisite(s): consent of instructor, demonstrated ability or knowledge in the practice and production of the arts. Advanced assignments in K-12 arts outreach along with workshops to explore the pedagogical requirements for and teaching techniques to be used by ArtsBridge scholars. For information on the ArtsBridge program see department. Course is repeatable to a maximum of 16 units. Cross-listed with AHS 189, ART 189, DNCE 189, MUS 189, and THEA 189.

CRWT 190. Special Studies. (1-5) To be taken with the consent of the chair of the department as a means of meeting special curriculum problems. Course is repeatable to a maximum of 8 units.

CRWT 191. Seminar in Creative Writing. (4) Seminar, three hours; extra reading, three 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. Minot

CRWT 195H. Senior Honors Thesis. (4) Consultation, one hour; outside research, four hours; extra reading, three hours; thesis, four 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, two 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) or No Credit (NC). Repeatable to 16 units.
Creative Writing and Writing for the Performing Arts / Dance / 201

CREATIVE WRITING AND WRITING FOR THE PERFORMING ARTS

Subject Abbreviation: CRWT

D. Eric Barr, M.F.A., Co-Director
Susan Straight, M.F.A., Co-Director
Program Office, 121 Arts, or
1607 Humanities and Social Sciences
(909) 787-2414
creativewriting.ucr.edu/academic_programs/academic_programs.html

Professors
D. Eric Barr, M.F.A.
Christopher Buckley, M.F.A.
Richard Hornby, Ph.D.
Maury Simon, M.E.A.
Susan C. Straight, M.E.A.

Assistant Professor
Robin Russian, M.E.A.

Lecturers
Judy Burns, C.Phil.
Judy Kronenfeld, Ph.D.
Marc Longboi, M.E.A.
Frances McConnel, Ph.D.
Derek Mckown, M.F.A.
Kevin Morrissey, M.F.A.
Dwight Yates, Ph.D.

GRADUATE PROGRAM

The Master of Fine Arts (M.F.A.) degree in Creative Writing and Writing for the Performing Arts 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 twenty-first century. The degree is a Plan I master’s degree consisting of workshops in chosen genres, culminating in a final project (the master’s thesis) which showcases the writer’s cultivated talents, in the form of a poetry collection, novel, memoir, screenplay, or full-length play. Financial assistance includes teaching assistantships and fellowships, as well as fellowships for community projects through the Glick Fellows Program of the Arts, and positions with the student-run literary magazine Mosaic.

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, with supplemental courses selected from the departments of Comparative Literature and Foreign Languages, English, Hispanic Studies, and the Film and Visual Culture program. Students can gain practical aspects of filmmaking from courses in Studio Art and Theatre.

Admission
Applicants to the program should demonstrate significant professional skill by submitting work 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 screenplay or play. Applicants must have a B.A. or B.S. degree from an accredited institution and must submit GRE scores, letters of recommendation, a self-statement, and a project proposal.

Foreign Language Requirement
None

Requirements consist of 48 units of course work (12 courses) and 8 units of master’s thesis project.

Course Work
The core curriculum includes the following:
1. Five workshop courses in genre of choice
2. One workshop course in a cross-genre
In addition, students must complete the following:
3. Three graduate-level literature courses from English or Comparative Literature
4. Two graduate-level seminars from Theatre and/or Creative Writing
5. One course in literature in translation (upper-division or graduate level) from Hispanic Studies or Comparative Literature or
   One additional cross-genre course
6. Thesis courses

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, novel, short story collection, or essay collection. Each student will be paired with one or two faculty members who will serve as the thesis advisor(s). Two faculty readers, in addition to the advisor(s), will evaluate the thesis work.

Normative Time to Degree
6 quarters

GRADUATE COURSES

CRWT 230. Creative Nonfiction. (4) Workshop, three hours; outside reading and reading, six hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of contemporary nonfiction, with emphasis on style, structure, and form. Primary focus is on production of original work. Course is repeatable to a maximum of 20 units.

CRWT 262. Fiction. (4) Workshop, three hours; extra writing and reading, four hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of contemporary poetry with emphasis on style, structure, and form. Primary focus is on production of original work. Course is repeatable.

CRWT 270. Poetry Workshop. (4) Consultation, one hour; workshop, three hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of contemporary poetry with emphasis on style, structure, and form. Primary focus is on production of original work. Course is repeatable.

CRWT 290. Directed Studies. (1-6) Outside research, three to eighteen hours. Prerequisite(s): graduate standing, consent of instructor and graduate advisor. Literature studies, directed by a faculty member, on special topics. Course is repeatable.

DANCE

Subject abbreviation: DNCE

Linda Tomko, Ph.D., Chair
Department Office, 121 Arts
(909) 787-3343; dance.ucr.edu

Professors
Susan Rose, M.F.A.
Fred Strickler, B.S.

Professor Emerita
Christina L. Schlundt, Ph.D.

Associate Professors
Sally Allen Ness, Ph.D. (Dance/Anthropology)
Wendy L. Rogers, M.A.
Linda J. Tomko, Ph.D.

Assistant Professors
Derek Burrill, Ph.D.
Anna B. Scott, Ph.D.
Jacqueline Shea Murphy, Ph.D.

Lecturer
Juan A. Rios, M.A.

Cooperating Faculty
Paul Gelles, Ph.D. (Anthropology)
George Haughey, Ph.D. (English)
Ethan Nasreddin-Longo, Ph.D. (Music)
Sterling Stuckey, Ph.D. (History)

Additional Faculty Associated with the Graduate Program in Dance History and Theory

Professors
Mark Franko, Ph.D.
(Teacher Arts Board, Santa Cruz)
Frank W.D. Ries, Ph.D.
(Division of Dance, UCSB)

Nancy Lee Ruyter, Ph.D.
(Department of Dance, UCI)

Associate Professor
John V. Chapman, Ph.D.
(Division of Dance, UCSB)

Distinguished Scholar
Selma Jeanne Cohen, Ph.D.
(Department of Dance, UCR)

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, anthropology, performance studies, and cultural studies.

The B.A. degree in Dance focuses on modern dance choreography. Technique, performance, history, anthropology, and pedagogy are also required. Dance technique courses are offered in modern dance, ballet, tap, Mexican Folklorico, and other dance/movement forms as they are practiced in various cultures of the world. Dance majors are required to 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 Student 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 $4,500. 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.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

The major requirements for the B.A. degree in Dance are as follows: Sixty-six (66) units of course work in Dance, 38 of which are upper-division.

1. Choreography, performance, and pedagogy series:
   - DNCE 014, DNCE 114A, DNCE 114B, DNCE 114C, DNCE 167, DNCE 180G, DNCE 180R
2. History, anthropology, and movement analysis series:
   - DNCE 120, DNCE 130/ANTH 130, DNCE 141, DNCE 142
3. Dance technique series:
   a) Eighteen (18) units from DNCE 067A, DNCE 067B, DNCE 067C
   b) Six (6) units from DNCE 071A-DNCE 075B

Minor

The student who minors in Dance may pursue one of two options, each designed to provide a coherent introduction to the study of dance as an art form.

Option I — emphasizes choreography and performance. Twenty-eight (28) units are required as follows:

1. Lower-division requirements (12 units)
   a) DNCE 014
   b) Six (6) units of DNCE 067A, DNCE 067B, DNCE 067C
   c) Two (2) units of DNCE 071A-DNCE 075B
2. Upper-division requirements (16 units)
   a) DNCE 114A, DNCE 114B
   b) DNCE 120
   c) Four (4) upper-division units in Dance except for DNCE 167, DNCE 190, DNCE 198-I

Option II — emphasizes dance history. Twenty-four (24) units are required, as follows:

1. Lower-division requirements (8 units)
   a) DNCE 007
   b) DNCE 014
2. Upper-division requirements (16 units)
   a) DNCE 120
   b) DNCE 130/ANTH 130
   c) DNCE 141
   d) DNCE 142

To obtain maximum value in either course of study, it is strongly recommended that all Dance minors enroll in one dance technique course each quarter. Technique courses are offered in modern dance, ballet, tap, dance forms of Mexico, and World Dance forms.

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

GRADUATE PROGRAM

The Department of Dance offers a Master of Arts (M.A.) in Dance History and Theory, a Master of Fine Arts (M.F.A.) in Dance, and a Ph.D. in Dance History and Theory.

Master’s Degrees

M.A. in Dance History and Theory

Admission

Students gaining admission to the Ph.D. program in Dance History and Theory may, after advisement and with the approval of the faculty committee, elect to pursue an M.A. degree in Dance History and Theory.

Plan I (Thesis) Students must complete a minimum of 36 quarter units of undergradu-
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 includes the following core courses:

- DNCE 240 (Improvising Choreography: Scores, Structures, and Strategies)
- DNCE 241 (Creating the Experimental: 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 four of the following five dance history and theory 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)
- DNCE 260 (Laban Movement Analysis)

In addition to these eight courses, students must take two courses relevant to their specific research project. These courses may be offered within or outside of the department, or they may be fulfilled through the option of field study, an off-campus period of study integral to the student's successful completion of the master's project.

An additional 12 units are taken through DNCE 297 and DNCE 299 for work on phases of 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. Once the student completes the eight core courses, a committee consisting of three faculty members, one of whom may be outside the department, supervises the final project.

Foreign Language Requirement None

Written and/or Oral Qualifying Examination In the middle of the second year, the student must write a project proposal for the final project. This document, 20–40 pages long, outlines the aesthetic focus of the student's research and provides a historical and philosophical contextualization for that project.

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. As examples, 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.

Normative Time to Degree 9 quarters

Doctoral Program

Ph.D. in Dance History and Theory

The Ph.D. program in Dance History and Theory provides an advanced interdisciplinary base for innovative research in the emerging field of cultural and historical studies of dance. The scope of the program embraces a theoretical consideration of all dimensions of the practice of dance — aesthetic issues; body politics; gender, ethnic, and class considerations; bodily learning and composition; and relationships between dance and contemporary culture. The program also promotes articulation of a variety of methodological approaches, the knowledge and application of which are appropriate to the analysis of bodily performance. The Dance faculty draws from a variety of academic and creative backgrounds, including choreography, technique, reconstruction, movement analysis, history, literature, anthropology, gender, race, and cultural studies. Students are expected to select a committee of faculty advisors early in their graduate careers and to work closely with them in planning their individual programs.

Admission Students must meet the general requirements for admission to the Graduate Division as shown in the Graduate Studies section of this catalog. 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 are required and determine eligibility.

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)

Six additional graduate-level courses are required, four from Dance and two from disciplines related to the student's research interest.

Language Requirement Competence in at least one foreign language and one notation system, or two foreign languages is also required for all students. 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 are required to 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, three hours; individual study, one hour; extra reading, one 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. Watching the Dance Go By.** (4) Lecture; three hours; outside research, two hours; term paper, one 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 non-majors.

**DNCE 014. Introduction to Choreography.** (4) Lecture; four and one-half hours; individual study, one and one-half 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 067A. Beginning Modern Dance Technique.** (2) Studio, three hours; individual study, one hour; extra reading, one 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, four and one-half hours; individual study, one hour; extra reading, one hour. 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, four and a half hours; individual study, one and a half 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 067D. Beginning Ballet Technique.** (2) Studio, three hours; screening, one hour; individual study, one hour; extra reading, one 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 067E. Intermediate Ballet Technique.** (2) Studio, three hours; screening, one hour; individual study, one hour; extra reading, one hour. Prerequisite(s): DNCE 067D recommended. Ballet technique at the intermediate 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 067F. Intermediate Tap Dance Technique.** (2) Studio, three hours; screening, one hour; individual study, one hour; extra reading, one 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. 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 067G. Advanced Tap Dance Technique.** (2) Studio, three hours; screening, one hour; individual study, one hour; extra reading, one hour. Prerequisite(s): DNCE 067F 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 067H. Dance of Mexico.** (2) Studio, three hours; screening, one hour; individual study, one hour; extra reading, one hour. Prerequisite(s): none. Traditional dances of Mexico 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 067I. Beginning World Dance Forms.** (2) Studio, three hours; screening, one hour; individual study, one hour; extra reading, one hour. Prerequisite(s): none. A survey of lead- ers from around the world. Course is repeatable.

**DNCE 067J. Intermediate World Dance Forms.** (2) Studio, three hours; screening, one hour; individual study, one hour; extra reading, one hour. Prerequisite(s): DNCE 067I 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.

### UPPER-DIVISION COURSES

**DNCE 114A. Dance Composition I.** (4) Lecture, three hours; studio, three 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, three hours; studio, three hours. Prerequisite(s): DNCE 114A. The continuing analysis of dance as an art form with emphasis on space, time and energy in motion as elements in choreographic style. In 114B, this is done on the advanced level.

**DNCE 114C. Dance Composition III.** (4) Lecture, three hours; studio, three 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, two hours; discussion, one hour; extra reading, two hours; observation and composition problems, one 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 compromising Effort theory, Shape theory, and Space Harmony theory.

**DNCE 127. Music Cultures of Southeast Asia.** (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theater 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
DNCE 128. Performing Arts of Asia. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, and the arts of China, Japan, Korea, and Southeast Asia. Open to music and dance majors only or with the instructor's consent. Cross-listed with ANTH 178, AST 127, EIST 172, and MUS 127.

DNCE 141. History of Ballet. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): none. Art dance from the Italian Renaissance through the ballet of contemporary dance. Cross-listed with ANTH 130.

DNCE 142. History of Modern Dance. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): none. Art dance from Isadora Duncan to Martha Graham and descendants.

DNCE 167. Dance Production. (2) Studio, six hours. Prerequisite(s): by audition. Study, production, and performance of dances. Course may be repeated for credit.

DNCE 168. Dance Touring Ensemble. (4) Studio, six hours; outside research, three hours. Prerequisite(s): consent of instructor. Dance Touring Ensemble members work with the instructor to create a lecture-demonstration and create a repertoire which is performed at various sites within the community. Course is repeatable to a maximum of 16 units. Rose in charge

DNCE 170 (E-Z). Dance and Visual Studies. (4) Lecture, three hours; screening, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. Addresses the intersections between the movement arts and their various manifestations in film, video, photography, and other visual media in a given cultural or historical context. E. Movement Performance, Video/Film, and the Body; F. Surrealism and Cinematic Bodies; G. Mechanizations of the Body; H. Women, Gender, and Politics; J. Architecture, Film, and Movement Performance, K. European Cinema and Performance; M. Popular Culture, Dance, and MTV; N. Politics of Dance: A Cinematographic Approach. Cross-listed with FVC 170 (E-Z). Ness, Tomko

DNCE 180 (E-Z). Dance Practicum. (4) Studio, eight 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 advanced of the quarter given, with the name of the guest instructor if it is not taught by the staff. C. Dance; D. 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 Preparatory; Q. Dance Notation; R. Pedagogy; S-Z to be announced.

DNCE 189. ArtsBridge. (1-4) Workshop, five hours per quarter; consultation, five hours per quarter; extra preparation or extra reading, three hours per week; fieldwork, one and half hours to six hours per week. Prerequisite(s): consent of instructor, demonstrated ability or knowledge in the practice and production of the arts. Advanced 12 arts outreach along with workshops to explore the pedagogical requirements for and teaching techniques to be used by ArtsBridge scholars. For information on the ArtsBridge program see department. Course is repeatable to a maximum of 16 units. Cross-listed with AIDS 189, ART 189, CRW 189, MUS 189, and THEA 189.

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.

DNCE 191 (E-Z). Seminar in Dance. (4) Seminar four hours. Prerequisite(s): students are expected to have had DNCE 141 and DNCE 142, although consent of the instructor may be obtained in unusual situations. Seminar in dance history and theory. Each seminar is concerned with a limited topic, announced in advance each quarter. G. Gender and bodies, M. Dance and politics, R. Pedagogy, and S. The Ballets Russes; U. Merce Cunningham.

DNCE 198-L. 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, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. An evaluation of the use of the score or structure as a predetermined 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 Experimental: Identifying the New. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three 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 250. Political Approaches to Dance Studies. (4) Seminar, three hours; consultation, one hour. Prerequisite(s): reading knowledge of a language other than English; graduate standing or consent of instructor. The study of dance and politics in and across cultures including cross-cultural studies of dance; multicultural approaches to dance history, ethnomusicological, ethnographic, and social 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, three hours; consultation, one hour. Prerequisite(s): determined by instructor of each segment. Studies in E. Periods; F. Styles; G. National Forms; H. Individual Artists; I. Choreographers; J. Aesthetics; K. Dance Literature; L. Notation.

DNCE 264. Oral History. (4) Seminar, three hours; individual study. Three 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. Ness, Shea Murphy, Tomko

DNCE 265 (E-Z). Seminar in Dance Research Methods. (4) Seminar, three hours; outside research, two hours; individual study, one hour. Prerequisite(s): graduate standing and/or consent of instructor. For DNCE 265, reading knowledge of German and/or French suggested, but not required. Analysis of dance subjects through the application of different methodological and theoretical orientations currently in use in a wide variety of disciplines. I. Contemporary Critical Theory and European Movement Performance; K. Performativity as Cultural Intervention. Shea Murphy

DNCE 267. Choreographies of Writing. (4) Seminar, three hours; discussion, one 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. Shea Murphy

DNCE 268. Choreography and Theory. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): consent of instructor. An analysis of contemporary choreography as social theory, and an investigation of correspondences between choreographers’ and scholars’ theories of individual and social identity. Assignments include critically viewing, analytically writing, and making dances from a theoretically informed perspective.

DNCE 269. Laban Movement Analysis. (4) Seminar, three hours; outside research, one hour; consultation, one hour; individual study. Prerequisite(s): DNCE 120; graduate standing or consent of-
DANCE 280. Colloquium in Current Topics in Dance Research. (2) Colloquium, two hours. Prerequisite(s): graduate standing or consent of instructor. Colloquia on current research topics in dance by students, faculty, and visiting scholars. Students who attend all colloquia 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.

DANCE 290. Directed Studies. (1-6) Outside research, three to eighteen 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.

DANCE 291. Individual Study in Coordinated Areas. (1-12) Outside research, three to thirty-six 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.

DANCE 292. Concurrent Analytical Studies in Dance. (1-4) Outside research, three to twelve 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 letter grade for specialized topics pursued with close faculty supervision. Course is repeatable.

DANCE 297. Directed Research. (1-6) Research, three to eighteen hours. Prerequisite(s): consent of instructor and graduate advisor. Individualized studies in specially selected topics in Dance under the direction of a staff member. Graded Satisfactory (S) or No Credit (NC).

DANCE 298-I. Individual Internship. (1-4) Individual study or apprenticeship with an appropriate professional individual or organization to gain experience and skill in activities related to dance history. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 12 units.

DANCE 299. Research for the Thesis or Dissertation. (1-12) Outside research, three to thirty-six 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.

DANCE 300. Teaching Practicum. (1-4) Lecture, one to four hours. Prerequisite(s): graduate standing. Supervised teaching in upper-division Dance History classes and lower-division Dance courses. Required of all Dance History teaching assistants. Credit not applicable toward degree unit requirements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EARTH SCIENCES
Subject abbreviation: GEO

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Professors
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Professors Emeriti
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Douglas M. Morton, Ph.D.

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Larissa F. Dobrzhinetskaya, Ph.D.

Adjunct Assistant Professors
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. These degree programs are designed for students with a strong interest in various aspects of the Earth Sciences. The programs place substantial emphasis on fieldwork with field courses, field trips in all appropriate courses, and excursions between quarters.

Academic Advising

Undergraduate advising in the Department of Earth Sciences is designed to allow close professional contact with our faculty and staff. Counseling on graduation and departmental requirements and on enrollment is handled by the department’s Student Affairs Advisor.

Each student selects a faculty mentor who counsels the student on career goals and research opportunities. The department recommends that each student 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

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. The latter usually requires three quarters and includes education courses and supervised teaching.

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 preferably, completing an undergraduate program that is state-approved for teacher preparation.

UCR has an approved undergraduate program for Earth Science 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 waiver program for the multiple subjects credential, are available in the Liberal Studies and Interdisciplinary Programs office, (909) 787-2743. Details and counseling on other waiver programs are available in the Department of Earth Sciences or the Graduate School of Education.

UCR does not yet have a state-approved undergraduate program for earth science majors who wish to teach at the secondary level. The Teaching Credential in Science, geoscience emphasis, is required for geoscience 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 coursework. The examination includes geoscience 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, the Student Affairs Office (1432 Geology Building), and the Graduate School of Education (1124 Sproul Hall).
Geology Major

The department offers three options for the Geology major: General Geology, Geobiology, and Biogeography. 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.

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.

Biogeography Option

Students entering the Biogeography option study spatial and temporal distribution, structure, dynamics, and conservation of natural communities and ecosystems. Biogeography has foundations both in biological and earth sciences. The biogeography of species is studied to determine evolutionary and dispersal history over long time scales as well as recent, local, and regional distributions in relation to our contemporary environment and impacts by people. Students in this option receive training in ecology, vegetation analysis, resource conservation, and management of natural lands.

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.

Degree 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.

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 030.

The department offers three options to majors in Geology: General Geology, Geobiology, and Biogeography. All students majoring in Geology are normally required to take the core curriculum. Both General Geology and Geobiology options require the Geology core curriculum presented below. The Biogeography option utilizes the Life Sciences core curriculum, enhanced by inclusion of required and optional Geology course work as indicated below.

General Geology and Geobiology Options

Core Requirements

1. Lower-division requirements
   a) GEO 001, GEO 002, GEO 003/BIOL 010
   b) BIOL 005A, BIOL 051A, BIOL 055B, BIOL 055C
   c) CHEM 001A, CHEM 001B, CHEM 001C
   d) MATH 009A, MATH 009B, MATH 009C
   e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 021A, PHYS 021B, PHYS 021C, or PHYS 040A, PHYS 040B, PHYS 040C

2. Upper-division requirements
   GEO 100, GEO 101, GEO 102, GEO 116, GEO 157, GEO 180

Option Requirements

1. Upper-division requirements
   a) General Geology Option
      (1) One course from GEO 118, GEO 160, GEO 161, GEO 162
      (2) One course from GEO 123, GEO 124, GEO 132, GEO 137
      (3) One course from GEO 140, GEO 141, GEO 145
   (4) One course from GEO 151, GEO 152/BIOL 152, GEO 153
   (5) Sixteen (16) additional units of upper-division related courses approved by the Undergraduate Advisor
   b) Geobiology Option
      (1) GEO 118
      (2) Three courses from GEO 151, GEO 152/BIOL 152, GEO 153, GEO 168A or GEO 168B
      (3) Sixteen (16) additional units of upper-division related courses approved by the Undergraduate Advisor

Biogeography Option

The Biogeography Option utilizes the Life Sciences core curriculum, enhanced by inclusion of both required and optional Geology course work as indicated below.

1. Lower-division requirements
   a) GEO 001, GEO 002, GEO 003/BIOL 010
   b) BIOL 005A, BIOL 051A, BIOL 055B, BIOL 055C
   c) CHEM 001A, CHEM 001B, CHEM 001C
   d) MATH 009A, MATH 009B
   e) PHYS 002A, PHYS 002B, PHYS 002C
   f) One of STAT 100A or STAT 120A
   (1) GEO 118
   (2) One course from GEO 151, GEO 152/BIOL 152, GEO 153
   (3) Sixteen (16) additional units of upper-division related 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
   a) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   b) PHYS 040A, PHYS 040B, PHYS 040C
   c) CHEM 001A, CHEM 001B
   d) GEO 001, GEO 003/BIOL 010, GEO 030

2. Upper-division requirements
   a) GEO 157, GEO 167, GEO 168A, GEO 168B
   b) CHEM 112A, CHEM 112B, CHEM 112C
   c) One of BCH 100 or BCH 110A
   d) Two courses from GEO 151, GEO 152/BIOL 152, GEO 153
   e) Two courses from GEO 160, GEO 161, GEO 162
   f) One of STAT 100A or STAT 120A
   g) Sixteen (16) additional units of upper-division related courses approved by the Undergraduate Advisor
2. Upper-division requirements
   a) PHYS 130A, PHYS 135A
   b) One course from PHYS 130B, PHYS 135B, PHYS 136, PHYS 177
   c) GEO 101, GEO 116, GEO 118, GEO 140, GEO 141
   d) Four (4) units of upper-division geosciences to be taken in consultation with faculty advisor
   e) GEO 002, PHYS 040D, and PHYS 040E are recommended

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, geotectonics, 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. 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 I (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.

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 proposal 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 the research proposal. The dissertation must present original 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, three hours; laboratory, three hours; one one-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. The Earth's Dynamic Surface. (4)
Lecture, three hours; laboratory, three hours; one two-day field trip. Prerequisite(s): none. Introduction to physical processes operating at the Earth's surface, emphasizing the interaction of the atmosphere, hydrosphere, and lithosphere. Focus given to development of landforms (such as rivers, glaciers, and deserts), dynamics and geological consequences of water movement and storage at the Earth's surface, and the role of climate and climate change in the formation and evolution of Earth's landscapes.

GEO 003. Headlines in the History of Life. (4)
Lecture, three hours; laboratory, three hours. Prerequisite(s): none. Evolution of life beginning with procellular 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, three hours; discussion, one hour. Application of basic principles of climate and geology to recognition of natural hazards and their mitigation. Topics will include fires, freezes, floods, winds, landslides, volcanic eruptions, earthquakes and tsunamis. Emphasis will be placed on confronting hazards of concern to home-buyers, planners, and conservationists in the western United States, especially southern California.

GEO 005. The Cosmos Factory. (4)
Lecture, three hours; discussion, one hour. A survey of selected topics in the earth and planetary sciences as applied to the present concepts of the cosmos, the nature and origin of the universe, and emphasizing recent problems in geophysics, geology, geochemistry, and planetary sciences.

GEO 007. Minerals and Human Health. (4)
Lecture, two hours; discussion, one hour; field, thirty hours per quarter. Prerequisite(s): none. An introductory overview of the role of minerals in human life and industrial activities. Discusses basic concepts of mineralogy and modern methods of mineral studies. Topics include the impact of minerals on human health, the role of minerals in modern biotechnologies, asbestos and silica problems, lead, and the role of minerals in modern technologies.
GEO 008. Earthquake Country. (4) Lecture, three hours; discussion, one 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, three hours; discussion, one 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. Students gain an understanding of the important role oceans play in regulating climate and the cycling of elements on the Earth's surface and how the ocean system has been, and continues to be, one of the most important influences on life.

GEO 010. Minerals, Energy, and Society. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 005 or equivalent. An introduction to the occurrence, availability, marketing, and usage of metals, minerals, petroleum, and other geologic resources, including both historic and recent trends. Conflicts between modern society's need for increasingly scarce resources and mounting environmental problems. Political and economic influences on international mineral and energy markets. Designed for non-geology majors, particularly those in economics, business administration, political science, education and environmental science.

GEO 020. Numerical Methods in the Earth Sciences. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CHEM 001B or CHEM 01HB (may be taken concurrently). Examines the mathematical, statistical, and computational techniques used in data collection and analysis in geology, geophysics, geochemistry, and paleobiology. Provides an overview of the geoscientific context for numerical methods.

GEO 030. Mineralogy. (5) Lecture, three hours; laboratory, five hours; two half-day and one one-day field trips per quarter. Prerequisite(s): CHEM 001B or CHEM 01HB (may be taken concurrently). GEOL 003 with grades of "C-" or better. A study of the principles of sedimentary basin analysis with an emphasis on provenance studies, clastic and carbonate diagenesis, burial history, regional and global stratigraphic cycles, sedimentation, and plate tectonics. Laboratory will emphasize the use of the petrographic scope and the cathodoluminescence for provenance and diagenetic studies.

GEO 100. Introductory Petrology. (5) Lecture, three hours; laboratory, six hours; three one-day field trips per quarter. Prerequisite(s): GEOL 020 and GEOL 030 with grades of "C-" or better. Introduction to the nomenclature and classification of igneous and sedimentary rocks and their metamorphosed equivalents. Topics include identification of the major rock-forming minerals and common rocks in hand samples and thin sections, and interpretation of rock fabrics and textures. Explores tectonic setting and the origins of major rock types.

GEO 101. Field Geology. (5) Lecture, two weeks; weekly one-day field trips. Prerequisite(s): GEOL 100 and GEOL 110 with grades 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 102. Summer Field Geology. (14) Field, six weeks. Prerequisite(s): GEOL 101 with a grade of "C-" or better or consent of instructor. Geological mapping and interpretation; writing of geological reports.
play of map projections. Analysis of trends in earth resources data handling.

**GEO 160. Atmospheric Circulation.** (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): GEO 002 with a grade of "C-" or better or GEO 002 with a grade of "C" or better. Topics include the fundamentals of the atmospheric circulation. Includes basic principles of atmospheric science and the atmosphere's role in the Earth's energy balance. Emphasis on understanding atmospheric phenomena such as weather patterns, climate change, and global warming. 4 units.

**GEO 161. Quaternary Paleoenvironmental Change.** (4) Lecture, two hours; laboratory, six hours; field trip, two days. Prerequisite(s): GEO 100 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. 4 units.

**GEO 162. Geomorphology.** (4) Lecture, two hours; laboratory, six hours; field trip, six days. Prerequisite(s): GEO 001 with a grade of "C-" or better or GEO 002 with a grade of "C" or better. Emphasis on understanding the Earth's surface processes and their role in shaping the landscape. Includes topics such as landforms, mass wasting, and fluvial processes. 4 units.

**GEO 163. Geophysical Methods.** (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): GEO 162 or consent of instructor. Introduction to geophysical methods used in the study of the Earth. Topics include gravity, magnetic, seismic, and electrical methods. 4 units.
ry emphasize the collection, preparation, and analysis of samples using modern methods.


**GEO 249. Field Methods in Quaternary Geology.** (4) Discussion, two hours; laboratory, six hours; three-two-day field trips. Prerequisite(s): GEO 101 or GEO 162 or consent of instructor. Geologic field problems and associated techniques for reconstructing Quaternary geologic, climatologic, and hydrologic events recorded in the landforms, stratigraphy, and weathering profiles of selected regions. Field techniques include relative and calibrated dating analysis, section measurements, morpho- and lithostratigraphic analysis, and map constructions in fluvial, lacustrine, glacial, coastal, and eolian environments.

**GEO 250. Graduate Seminar in Geological Sciences.** (1) Seminar, one 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, three hours; laboratory, zero to six hours. Prerequisite(s): consent of instructor. Selected advanced topics from paleontology. Course content will vary from quarter to quarter. Flexible units (3, 4, or 5) allow the instructor to decide whether or not an individual student will be required to take the laboratory. Course is repeatable.

**GEO 253. Advanced Topics in Petrology and Geochemistry.** (3-5) Seminar, three hours; laboratory, zero to six 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 255. Advanced Topics in Sedimentary Petrology.** (4) Seminar, two hours; laboratory, six 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 257 (E-Z). Advanced Topics in Geophysics.** (4) Seminar, four hours. Prerequisite(s): consent of instructor. Selected advanced topics from geophysics. Course content varies from quarter to quarter. Courses are repeatable with separate letter designation.

**GEO 259. Tectonics of California.** (4) Lecture, two hours; seminar, two hours. Prerequisite(s): consent of instructor. Geologic, 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 268. Seminar in Biogeography.** (4) Seminar, two hours; research, six hours. Prerequisite(s): GEO 168 or consent of instructor. Topics from Mediterranean ecosystems, fire ecology, naturalization of exotic species, succession and ecosystem state theory, mapping of vegetation. Course is repeatable to a maximum of 8 units.

**GEO 283 (E-Z). Seminar in Advanced Topics in Systematic Geography.** (4) Seminar, two hours; research, six hours. Prerequisite(s): GEO 157 or consent of instructor. Location Analysis, H. Transportation Geography, I. Quantitative Geography.

**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, three 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, three 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.

### ECONOMICS

**PROFESSIONAL COURSES**

**GEO 301. Teaching of Geosciences at the College Level.** (1) Seminar, one hour. Prerequisite(s): graduate student status. Oral reports by graduate students, faculty, and visiting scholars on current research topics 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, one to four hours; practicum, two to eight 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

Stephen E. Cullenberg, Ph.D., Chair Department Office, 4126 Sproul (909) 787-5037 economics.ucr.edu

Professors
Taradas Bandyopadhyay, Ph.D. Susan B. Carter, Ph.D. Stephen E. Cullenberg, Ph.D.
Gary A. Dymski, Ph.D. Mason Gaffney, Ph.D. Keith B. Griffin, Ph.D.
Azizur R. Khan, Ph.D. Victor D. Lippit, Ph.D. Prasanta K. Pattanaik, Ph.D.
Richard C. Sutch, Ph.D. Aman Ullah, Ph.D.

Professors Emeriti
Ronald H. Chilcote, Ph.D. Howard J. Sherman, Ph.D., Jur.D.

Associate Professors
Marcelle Chauvet, Ph.D. David H. Fairris, Ph.D. Gloria González-Rivera, Ph.D.
Jang-Ting Guo, Ph.D. Steven Heffland, Ph.D. Tae-Hwy Lee, Ph.D.

Assistant Professor
Xu Cheng, Ph.D.

**Cooperating Faculty**
Keith C. Knapp, Ph.D. (Environmental Sciences)
Roger L. Ransom, Ph.D. (History)

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.

### Degree Requirements

**University Requirements**

See the Undergraduate Studies section for requirements that all students must satisfy.

**College Requirements**

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

### 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 (16 units)
   a) ECON 002, ECON 003
   b) MATH 009A, MATH 009B
In order to receive the B.A. degree in Economics/Administrative Studies, students must fulfill the following requirements:

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**Economics/Administrative Studies Major**

In order to receive the B.A. degree in Economics/Administrative Studies, students must fulfill the following requirements:

- **Economics requirements (52 units)**
  1. ECON 002, ECON 003
  2. ECON 102A, ECON 102B
  3. Twenty-four (24) additional upper-division units in Economics
  4. ECON 101/STAT 101
  5. One of MATH 009A, MATH 022, or equivalent

- **Administrative Studies requirements (37 units)**
  1. Lower-division courses (17 units)
    a) BSAD 010A, BSAD 020A
    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 102A or ECON 130 or ECON 162/BSAD 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
    b) A three-course track (12 units) in Business Administration courses from one of the following:
    (1) Organizations (General): BSAD 105/ANTH 105, BSAD 176/SOC 176, SOC 150, SOC 151
    (2) Human Resources Management/Labor Relations: BSAD 152/ECON 152, BSAD 153/ECON 153, BSAD 155, BSAD 157, PSYC 142
    (3) Business and Society: BSAD 161, PHIL 116, POSC 182, POSC 186
    (4) Marketing: BSAD 110, and two from BSAD 112, BSAD 113, BSAD 114, BSAD 117
    (5) Managerial Accounting/Taxation: BSAD 163, and two from BSAD 166, BSAD 168A, BSAD 168B
    (6) Financial Accounting: BSAD 163, BSAD 165A, BSAD 165B
    (7) Finance: BSAD 134/ECON 134 and two from BSAD 135A, BSAD 136, BSAD 137, BSAD 138, BSAD 139
    (8) Management Information Systems: BSAD 170, BSAD 171, BSAD 173
    (9) Production Management: BSAD 121/STAT 121, and two from BSAD 122, BSAD 126, BSAD 127/STAT 127

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**Economics/Law and Society Major**

The major requirements for the B.A. degree in Economics/Law and Society are as follows:

- **Requirements for Economics (44 units)**
  a) ECON 002, ECON 003
  b) ECON 119
  c) ECON 102A, ECON 102B, ECON 103A
  d) Twenty (20) additional units of upper-division Economics courses

- **Requirements for Law and Society (36 units)**
  a) PHIL 007 or PHIL 007H
  b) IWSO 100
  c) One course chosen from the following list: ECON 111, PSYC 012, SOC 110A, POSC 114 (or equivalent course in research methods)
  d) Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 175, PSYC 175, SOC 159 (One of these courses may be replaced by a substitute choice from a list of courses published annually by the Law and Society Faculty Committee. Not more than two of the courses taken to meet this requirement [2.d] may be from the same department.)
  e) IWSO 193, Senior Seminar

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**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 are required to take

- **Lower-division requirements (8 units):**
  ECON 002, ECON 003

- **Upper-division requirements (24 units):**
  a) ECON 102A, ECON 103A
  b) Four additional upper-division courses (16 units) in Economics

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

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**GRADUATE PROGRAM**

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.
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.

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).

Admission
Students are normally admitted only in the fall quarter. Application forms may be obtained from the Department of Economics, Sproul Hall, University of California, Riverside, Riverside, CA 92521; (909) 787-5037. 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 must be sent to the department.

Candidates for degrees are required to complete all general University requirements as specified in the Graduate Studies section of this catalog.

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 Program
Students should have a 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 are expected to 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.

Requirements for the Doctoral Degree

Core Requirements

1. Economic Theory
   Students must complete the following courses:
   a) ECON 200A, ECON 200B, ECON 200C (Microeconomic Theory)
   b) ECON 201A, ECON 201B, ECON 201C (Macroeconomic Theory)
   c) ECON 202A (Topics in Economic Theory: Critiques and Alternative Approaches) or ECON 202B (Topics in Economic Theory: Applications)
   d) ECON 212 (History of Economic Theory and Methodology)

   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 encompassed by ECON 201A, ECON 201B, and ECON 201C). Both examinations are given at the end of the first year, at the beginning of the fall quarter, and at the beginning of the fall semester. 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 one of the examinations. Copies of the rules regarding these cumulative examinations are available in the department office.

2. Quantitative Methods
   Students must complete the following courses:
   a) ECON 205A, ECON 205B, ECON 205C (Econometric Methods I, II, III)
   b) ECON 206 (Mathematics for Economists)

   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 202A or ECON 202B, ECON 212, and ECON 206. Core courses may be waived, based on equivalent graduate work completed elsewhere. The comprehensive examinations, however, may not be waived.

Field Requirements

All students must complete course work by taking one of the following options:

Option 1—Students must complete course work in two fields and pass a comprehensive field examination in the field they designate as their major field. Students must take at least three courses in each of both fields.

Option 2—Students must complete course work in one major field consisting of three courses and two fields consisting of two courses each. Students must pass a comprehensive examination in their major field.

Required of all students

Students must write an original research paper that must be approved by the graduate affairs committee.

Field comprehensive examinations are given twice a year. No one course may be used to satisfy the course requirements of two fields.

1. Advanced Econometrics
   Students must complete the courses (a) and (b) and one of the courses from (c), (d), (e), or (f) listed below:
   a) ECON 285E (Advanced Econometric Methods)
   b) ECON 285F (Topics in Econometrics)
   c) ECON 285G (Applied Econometrics)
   d) ECON 285-I (Macroeconometrics)
   e) ECON 285J (Nonparametric Econometrics)
   f) ECON 285K (Microeconometrics)

2. Advanced Macroeconomic Theory
   Students must complete the following courses:
   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 courses:
   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
   (Former Marxist and Comparative Fields)
   ECON 202A (Topics in Economic Theory: Critiques and Alternative Approaches) is recommended.
   Students must complete three of the following courses:
   ECON 272A (Political Economy: Marxist 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 courses:

- ECON 215 (Applied Quantitative Methods in Development Economics)
- 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. International Trade Theory

Students must complete the following courses:

- ECON 234 (International Trade Theory)
- ECON 235 (Topics in International Trade Theory)

7. Labor Economics

Students must complete the following courses:

- ECON 240 (Labor Supply, Labor Demand, and the Structure of Wages)
- ECON 241 (Labor Institutions and Macro Labor Outcomes)
- ECON 243 (Topics in Labor)

8. Money, Credit, and Business Cycles

Students must complete three of the following courses:

- ECON 250 (Money, Credit, and the Macroeconomy)
- ECON 251 (Business Cycle Theory)
- ECON 252 (Fiscal Policy, Employment, and Capital Accumulation)
- ECON 254 (Topics in Money, Credit, and Business Cycles)

9. Resource and Environmental Economics

Students must complete three of the following courses:

- ECON 207 (Environmental Economics)
- ECON 208 (Models of Nonrenewable Resource Management)
- ECON 209 (Models of Renewable Resource Management)

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 Economic History, International Economics, and Public Economics.

Oral Qualifying Examination

To advance to candidacy, a Ph.D. student must pass an oral qualifying examination. This examination covers the student’s dissertation prospectus and subject matter related to the student’s field. It is given by a committee of five faculty, at least one of whom must not be a member of the Department of Economics faculty. Students who enter the program fully prepared normally take the examination by the end of the third year.

Dissertation Requirements 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.

Requirements for the Master’s Degree

Course Requirements

Students must complete a total of 36 units, 24 of which must be at the graduate level. The following courses are required of all students:

1. ECON 110 (Mathematical Economics) or ECON 206 (Mathematics for Economists)
2. ECON 204A (Microeconomic Theory for Master’s Students) or ECON 200A-ECON 200B (Microeconomic Theory)
3. ECON 212 (History of Economic Theory and Methodology)
4. ECON 107 (Introductory Econometrics I) and ECON 108 (Introductory Econometrics II), or ECON 205A (Econometric Methods I) and ECON 205B (Econometric Methods II)
5. ECON 215 (Applied Quantitative Methods in Development Economics)

Comprehensive Examination Requirement

Students must pass one of the following examinations:

1. Master’s examination covering the topics in ECON 204A, ECON 204B
2. Doctoral comprehensive examination in either microeconomic theory or macroeconomic theory (grated at the master’s level)
3. Doctoral Comprehensive Examination in any of the nine fields described above (grated at the master’s level)

LOWER-DIVISION COURSES

ECON 001. Introduction to Economics. (4)
Lecture, three hours; discussion, one hour. Examines the history of economic institutions, the ideas of the great economists, and selected contemporary issues.

ECON 002. Introduction to Macroeconomics. (4)
Lecture, three hours; discussion, one hour. 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 or ECON 002H.

ECON 002H. Honors Introduction to Macroeconomics. (4)
Lecture, three hours; discussion, one hour. 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 or ECON 002H.

ECON 003. Introduction to Microeconomics. (4)
Lecture, three hours; discussion, one hour. 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.

ECON 006. Introduction to Environmental Economics. (4)
Lecture, three hours; discussion, one 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. Cross-listed with ENVS 006. Does not satisfy the Natural Science breadth requirement for the College of Humanities, Arts, and Social Sciences.

UPPER-DIVISION COURSES

ECON 101. Statistics for Economics. (4)
Lecture, three hours; discussion, one hour. Laboratory, one hour. Prerequisite(s): MATH 005. An introduction to the basic statistical methods for economics. Topics include econometric data analysis, index numbers, univariate and bivariate probability distributions, correlation and regression, sampling distributions, properties of estimators, and hypothesis testing. Cross-listed with STAT 101.

ECON 102A. Microeconomic Theory. (4)
Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 005 or consent of instructor. MATH 009A or MATH 022 strongly recommended. A comprehensive discussion of the competitive market system, modern utility theory of consumer behavior, firm behavior in product and factor markets, and monopoly.

ECON 102B. Microeconomic Theory. (4)
Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 102A or consent of instructor. A continuation of ECON 102A. Covers imperfect competition, general equilibrium, welfare economics, intertemporal decision making, uncertainty, and information.

ECON 103A. Macroeconomic Theory. (4)
Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 002. The theory of income, employment, and the price level. The role of the international economy. Introduction to fiscal and monetary policy.

ECON 103B. Macroeconomic Theory. (4)
Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 103A. ECON 102A recommended. The theory of money
growth, inflation, business cycles, and stabilization policy. The role of money and credit. The microfoundations of consumption and investment. Selected policy debates. Introduction to alternative macroeconomic theories.

ECON 104. Data Analysis for Economics and Business. (4) Lecture, three hours; discussion, one hour; laboratory, one hour. Prerequisite(s): ECON 002 or ECON 003; ECON 101/STAT 101; or consent of instructor. Introduction to the basic tools of econometrics. Focuses on issues relating to the linear regression model, including heteroskedasticity, serial correlation, and multicollinearity.

ECON 105. Econometrics I. (4) Lecture, three hours; discussion, one hour; laboratory, one 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, time series models, dynamic time series models, unit roots and Auto-Regressive Conditional Heteroskedasticity (ARCH), and forecasting.

ECON 106. Mathematical Economics. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102A, MATH 009A, MATH 009B. The use of mathematical tools to analyze economic problems, with emphasis on linear algebra, differential and integral calculus. Applications to comparative statics and optimization problems.

ECON 107. Introductory Econometrics I. (4) Lecture, three hours; discussion, one hour; laboratory, one 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, time series models, dynamic time series models, unit roots and Auto-Regressive Conditional Heteroskedasticity (ARCH), and forecasting.

ECON 108. Introductory Econometrics II. (4) Lecture, three hours; discussion, one hour; laboratory, one 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, time series models, dynamic time series models, unit roots and Auto-Regressive Conditional Heteroskedasticity (ARCH), and forecasting.

ECON 110. Mathematical Economics. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102 or ECON 003. 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. (4) Lecture, three hours; discussion, one hour; laboratory, one hour. Prerequisite(s): ECON 002 or ECON 003. An analysis of time series and related problems. Emphasis on forecasting techniques and their application in various fields.

ECON 113. The Political Economy of Latin America. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the political economy of Latin America, including historical processes, the role of capital and labor, and the nature of the state and society.

ECON 115. Marxian Political Economy. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the political economy of Latin America, including historical processes, the role of capital and labor, and the nature of the state and society.

ECON 116. Foundations of Political Economy. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the political economy of Latin America, including historical processes, the role of capital and labor, and the nature of the state and society.

ECON 117. Economics and Philosophy. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 003 or consent of instructor. An examination of the historical development of economic theory, including the role of philosophy in shaping economic thought.

ECON 119. Law and Economics. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): ECON 002 or ECON 003 or consent of instructor. An analysis of the role of law in shaping economic outcomes, including contract law, tort law, and criminal law.

ECON 120. The Great Economists. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the political economy of Latin America, including historical processes, the role of capital and labor, and the nature of the state and society.

ECON 123. American Economic History. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 002, ECON 003. An examination of the historical development of economic thought, including the role of philosophy in shaping economic theory.

ECON 125. History of Economic Thought. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 002, ECON 003. An examination of the historical development of economic thought, including the role of philosophy in shaping economic theory.

ECON 130. Introduction to Money, Banking, and Credit. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 002. Basic economic principles of money and credit, including the operations of the banking system and the role of financial institutions.

ECON 132. Public Finance. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102A and ECON 103A. An examination of the role of government in the economy, including taxation, government expenditure, and fiscal policy.

ECON 134. Corporate Finance and Investment. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 003; upper-division standing. An examination of the role of corporate financial management, including investment analysis and portfolio selection.

ECON 135. The Stock Market. (4) Lecture, three hours; discussion, one hour; individual study, three hours. Prerequisite(s): ECON 002, ECON 003. An examination of the historical development of the stock market and its role in the macroeconomy. Topics include market efficiency, valuation of securities, and the role of institutional investors.

ECON 143A. Environmental Economics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 003, MATH 002 or equivalent; or consent of instructor. An examination of the role of environmental resources and the environment with emphasis on environmental quality. Topics include the role of economics in environmental management, including pollution control, and the design of efficient and sustainable environmental policies.

ECON 143B. Natural Resource Economics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 143A/ENSC 143A or consent of instructor. An examination of the role of environmental resources and the environment with emphasis on environmental quality. Topics include the role of economics in environmental management, including pollution control, and the design of efficient and sustainable environmental policies.

ECON 143C. Ecological Economics and Environmental Valuation. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 143A/ENSC 143A or consent of instructor. An examination of the role of environmental resources and the environment with emphasis on environmental quality. Topics include the role of economics in environmental management, including pollution control, and the design of efficient and sustainable environmental policies.

ECON 144. Urban Economic Problems. (4) Lecture, three hours; term paper, one hour. Prerequisite(s): ECON 003 or consent of instructor. An examination of the role of environmental resources and the environment with emphasis on environmental quality. Topics include the role of economics in environmental management, including pollution control, and the design of efficient and sustainable environmental policies.

ECON 145. Land and Resource Economics. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102A. An examination of the role of environmental resources and the environment with emphasis on environmental quality. Topics include the role of economics in environmental management, including pollution control, and the design of efficient and sustainable environmental policies.
### ECON 160. Industrial Organization. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102A. A study of the organization and structure of the American industrial system with emphasis on its production and pricing behavior and policies, its market structure, and public policies regulating or influencing its market behavior. Cross-listed with BSAD 160.

### ECON 162. Managerial Economics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 003. ECON 102A recommended. Applications of economic analysis to problems of management, especially of capital. Emphasis on production economics and cost analysis. Cross-listed with BSAD 162.

### ECON 163. Economics and Business Strategy. (4) Lecture, three hours, individual study, three hours. Prerequisite(s): ECON 101ST 101, ECON 102A, ECON 102B, ECON 103A. An analysis of the relationship between economic theory and business strategy, including the imperfections of the market structure and conventional models of government intervention in the market. The examination of strategic business behavior and the application of economic and game theory, including analysis of the informal sector and its relationship to the formal economy. Cross-listed with BSAD 163.

### ECON 171. International Finance. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 002. International monetary theory and its applications. Topics include balance of payments; exchange rates; open-economy macroeconomics; international monetary institutions. Selected policy issues addressed.

### ECON 175. Comparative Analysis of Economic Systems. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102. Upper-division standing or consent of program. Comparing and contrasting the economic systems of different nations, and their historical and political backgrounds. Cross-listed with BSAD 175.

### ECON 178. International Trade. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 003. A study of the pure theory of trade, trade policy, and international factor movements including illustrative applications to current issues and problems. Cross-listed with BSAD 178.

### ECON 179. The Chinese Economy. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 102. Upper-division standing or consent of instructor. A study of China’s economic development, with some historical background, but with the main focus on the modern period. Topics include agricultural collectivization and decollectivization, alternative socialist development strategies, and economic reform.

### ECON 180. Transition from Socialism to Capitalism. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 002, ECON 003, 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, three hours; individual study, three hours. Prerequisite(s): ECON 002, ECON 003. 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, three hours; individual study, three hours. Prerequisite(s): ECON 002, ECON 003. 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 185. Economic Development in Latin America. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 002, ECON 003. A comparative analysis of the major trends in Latin American economies since 1945. Topics include the theory and practice of import substitution, industrialization, the debt crisis, stabilization and structural adjustment, regional integration, poverty and income distribution, the informal sector, the agricultural sector, and the environment.

### ECON 190. Special Studies. (1-5) Course is repeatable to a maximum of 12 units.

#### ECON 191A. Senior Seminar. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): senior standing; ECON 102A, ECON 102B, ECON 103A, ECON 103B. Topics include current issues in the profession. Students complete a research paper and present their results in the seminar. Topics vary from year to year.

#### ECON 191B. Senior Seminar. (4) Seminar, three hours; individual study, three 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 199-I. Internship in Economics. (1-12) Prerequisite(s): junior standing 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 government and 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) Course is repeatable to a maximum of 12 units.

#### ECON 200. Microeconomic Theory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 102A and ECON 102B or equivalents; ECON 206. Focuses on consumer and producer theory under conditions of certainty.

#### ECON 200B. Microeconomic Theory. (4) Lecture, three hours; individual study, three hours. 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, three hours; individual study, three hours. 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, three hours; discussion, one hour. Prerequisite(s): ECON 103A and ECON 103B or equivalents; ECON 206 (may be taken concurrently). Examines the basic issues and models of macroeconomics.

#### ECON 201B. Macroeconomic Theory. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 201A or equivalent. Covers business cycles, the empirical characteristics and the theoretical models.
models, random utility models, discrete choice models, the contingent valuation technique, and hedonic wage and pricing models. Covers theory, empirical methods, and applications.

ECON 212. History of Economic Theory and Methodology. (4) Lecture, three hours; individual study, three 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 215. Applied Quantitative Methods in Development Economics. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Construction of national income and other macroeconomic accounts. Input-output accounts, sample survey methods, and other empirical techniques.

ECON 234. International Trade Theory. (4) Lecture, three hours; individual study, three 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, three hours; individual study, three hours. Prerequisite(s): ECON 254 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, three hours; individual study, three 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, three hours; individual study, three 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, three hours; individual study, three 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 topic changes.

ECON 250. Money, Credit, and the Macroeconomy. (4) Seminar, three hours; individual study, three 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, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. An in-depth treatment of theories of business cycles and empirical data on relations of variables over the cycle.

ECON 252. Fiscal Policy, Employment, and Capital Accumulation. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing. This course will cover governmental taxing, spending, and debt, especially their effects on capital formation, income distribution, and employment.

ECON 254. Topics in Money, Credit, and Business Cycles. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. An in-depth study of theoretical and empirical topics in the business cycles of the macroeconomy, monetary and fiscal theory, and monetary and fiscal policy.

ECON 258. Seminar in Resource Economics. (4) Seminar, three hours; research, three hours. Prerequisite(s): graduate standing or consent of instructor. Selected topics in E. Environmental Economics. F. Natural Resource Economics. G. Urban and Regional Economics. H. Agricultural Economics.

ECON 260. Theories of Economic Development. (4) Seminar, three hours; individual study, three 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, three hours; individual study, three 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, three hours; individual study, three 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 market prices in evaluating project profitability. The role of income distribution, externalities, and uncertainty in project evaluation.

ECON 264. Topics in Economic Development. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Selected themes for advanced study in economic development. Course is repeatable to a maximum of 4 units.

ECON 265. Agricultural and Rural Development. (4) Seminar, three hours; individual study, three 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 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, three hours; individual study, three 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, three hours; individual study, three 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, three hours; individual study, three 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 contemporary institutional contexts. Topics 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, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Explores economic institutions and various methodological approaches to economics from a comparative perspective. Topics include institutional foundations 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 will also be discussed.

ECON 278. The Political Economy of the State. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Examination of theories of the capitalist state: Marxist, non-Marxist, and post-Marxist. Assessment of theory through case studies of advanced industrial and third world societies.

ECON 279. Political Economy: Advanced Topics. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Topics in the methodology and theory of political economy. Repeatable to a maximum of 4 units.

ECON 281A. Workshop in Political Economy. (2) Seminar, two hours; individual study, two hours. Prerequisite(s): graduate standing. Reading and discussion of selected topics in political economy; presentation and discussion of student papers and current faculty research in the area. Graded Satisfactory (S) or No Credit (NC).

ECON 281B. Workshop in Political Economy. (2) Seminar, two hours; individual study, two hours. Prerequisite(s): graduate standing. Reading and discussion of selected topics in political economy; presentation and discussion of student papers and current faculty research in the area. Graded Satisfactory (S) or No Credit (NC).

ECON 282. (E-Z). Advanced Macroeconomic Theory. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): passing grade on the macroeconomic comprehensive examination or consent of instructor. Covers advanced topics in macroeconomic theory, State-of-the-art research papers and books are read, and presentations will be made by students as well as 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, three hours; outside research, three hours. Prerequisite(s): passing grade on the microeconomic comprehensive examination or consent of instructor. Covers advanced topics in microeconomic theory, State-of-the-art research papers and books are read, and presentations are made by students as well as 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. ECON 283K is repeatable to a maximum of 8 units.

ECON 285. (E-Z). Advanced Econometrics. (4) Seminar, three hours; outside research, three 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. Topics in Econometrics; F. Applied Econometrics; G. Macroeconometrics; J. Nonparametric Econometrics; K. Microeconometrics. ECON 285F is repeatable to a maximum of 8 units.

ECON 289. Colloquium in Economics. (1) Seminar, two 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). May be repeated for credit.

**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)** Research, three to thirty-six 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 36 units), or (2) a student may take up to 18 additional units after the award of the M.A. but prior to successful completion of the Ph.D. qualifying examination.

**ECON 292. Concurrent Analytical Studies. (2-4)** Lecture, one to three hours; research, six to twelve 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 throughout 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 faculty member to be included as part of the doctoral dissertation. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PROFESSIONAL COURSE**

**ECON 302. Teaching Practicum. (1-4)** Practicum, three to twelve hours; seminar, one hour. Prerequisite(s): limited to department TCs; 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**

**Subject abbreviation: EDUC**

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Frank M. Gresham, Ph.D.
E. Mark Hanson, Ph.D. (Education/Management)
Douglas E. Mitchell, Ph.D.
Richard S. Newman, Ph.D.
Flora I. Ortiz, Ph.D.
Reba N. Page, Ph.D.

H. Lee Swanson, Ph.D. Peloy Chair in Learning Disabilities

**Types of M.A. Degrees**

Candidates for this degree complete the general university requirements and follow Plan II (Comprehensive Examination). A minimum of 36 upper-division and graduate units are required, 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.

**Plan A—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 for the M.A. include Educational Administration (focusing on institutional leadership and policy studies), Special Education, Curriculum and Instruction, and Educational Psychology. Course requirements for the programs may be obtained from the Graduate School of Education graduate degree program office, 1124 Sproul Hall. Any variance with existing program course work must be approved by the graduate advisory committee in the Graduate School of Education.

The M.A. program gives students the option of completing a thesis or taking a comprehensive written examination.

**Plan I (Thesis)**

Under the thesis plan, 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, each candidate submits a plan for the thesis to the committee. The plan states the thesis topic, areas of knowledge, and research skills in which they wish to become competent at the master’s degree level. Each candidate also lists courses to be taken for developing competence in their area of specialization. The plan for the thesis is reviewed and approved by a committee of three faculty members. Upon completion of the thesis, the candidate submits it to the 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)**

A minimum of 36 quarter units are required in upper-division and graduate courses in Education and related fields as defined in existing programs. At least 18 of the 36 units will be in graduate courses, of which none will be in graduate research for the thesis.

A faculty member from the program area specialization shall be 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. Any variation in this program plan from existing approved programs must be sanctioned by the graduate advisory committee.
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.

### Master of Education

The combined M.Ed. and teaching credential program allows students to complete requirements for a California teaching credential and a master’s degree in one academic year and a summer term.

The M.Ed. program is ideally suited to UCR graduates who have taken prerequisite courses as an undergraduate. All prerequisites must be completed before a student can be admitted to the M.Ed. program. The GRE is not required.

To be considered for the M.Ed. program, prospective students must submit two separate applications: one to the Graduate Division, and one to the teaching credential program.

Students not admitted to the M.Ed. program can still be accepted into the credential program. However, students cannot be in the M.Ed. program without concurrent enrollment in the credential program. Those who already possess California teaching credentials are not eligible for the M.Ed.

### Admission

The following are requirements:

1. A baccalaureate degree from an accredited institution
2. The prerequisite courses EDUC 109, EDUC 110, EDUC 116, EDUC 139, and either EDUC 172 or EDUC 174
3. A minimum GPA of 3.2 based on the last 90 quarter units in the baccalaureate program
4. Verification of subject-matter proficiency through completion of an approved program or passing the appropriate test
5. Passage of the California Basic Educational Skills Test (CBEST)
6. Possession of a Certificate of Clearance after background check
7. Submission of letters of recommendation and transcripts

### Course Work

The M.Ed. requires 66 units, 36 of which are in 200-series core courses. The remaining 30 units are in 300-series professional courses to satisfy requirements for the elementary or secondary teaching credential. Four required courses must be taken during Summer Sessions.

### Analytical Project

No thesis or comprehensive exam is required. Instead, students complete an analytical project that builds on students’ prior course work and links educational theory and research with the dynamics of classroom teaching. 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 and may become part of a larger electronic portfolio developed by all credential students.

### Teaching Requirement

Students complete supervised teaching assignments in elementary or secondary classrooms.

### Foreign Language Requirement

None

### Normative time to degree

12 months

### Doctoral Degree

The doctoral program in Education is designed to prepare scholars for teaching and research in the area of education. Admission to the Ph.D. program 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.

General areas of specialization for the Ph.D. include Curriculum and Instruction, Educational Administration (focusing on institutional leadership and policy studies), Special Education, Educational Psychology, and School Psychology.

Following admission to the program, students are assigned a preliminary program advisor who guides them during the initial phase of their program. A common core curriculum is currently being developed. Within the first seven quarters of residence, students write a data-based or literature review paper. The faculty of each program area set up criteria and guidelines for the paper and judge its merits.

Papers accepted by the program area group are presented in a public forum of faculty and students from the student’s program area group. During this next phase of the doctoral program, students are expected to pursue in-depth studies in at least two fields of concentration identified by the students and their guidance committee. Preparation in each field consists of sufficient study to allow the students to grasp the essential concepts and inquiry methods of that field.

After or near completion of course work in the second phase and before being advanced to candidacy, the student is required to pass qualifying examinations, both written and oral. The written examination is prepared and evaluated by the program guidance committee, in consultation with faculty associated with the student’s area of specialization. It requires the student to:

1. Review critical literature in an assigned field
2. Demonstrate competence in research methodologies, and
3. Demonstrate competence over content in fields of specialization.

There is also a Ph.D. teaching requirement which is determined by the student’s program guidance committee. There is no foreign language requirement.

Following the written qualifying examination, and before the oral qualifying examination, students develop a prospectus for a research proposal setting forth the direction of their proposed dissertation. Once this has been approved by the program guidance committee, the oral qualifying examination committee is appointed. This is a five-member faculty committee made up of the principal advisor, three faculty members from the Graduate School of Education and one UC faculty member from outside the school. The qualifying committee uses the prospectus as a focus for examining the student, but the questioning may go beyond the prospectus. Students pass the oral qualifying examination when the committee is satisfied that the prospectus, 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. Once the oral qualifying examination has been passed, a three-member dissertation committee is appointed, and the student is recommended to the Graduate Division for advancement to candidacy.

Prior to commencing the dissertation research, students must have a dissertation proposal approved by a dissertation committee. Following completion of the dissertation, an oral defense is scheduled by the chair of the candidate’s committee. 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

To obtain a list of dates for Graduate Degree Info sessions, check education.ucr.edu. The seminars are free; no reservations are needed.

### Joint Doctoral Program with California State University

A joint doctoral program with campuses of the California State University is being developed. For further information on this and other graduate degree programs in Education, contact the graduate program office, Graduate School of Education, phone (909) 787-5990.

### Credential Programs

The Graduate School of Education offers teaching credential programs and a program for the preparation of administrators. All of UCR's programs for the credentialing of teachers and administrators are accredited by the California Commission on Teacher Credentialing. Admission to credential programs in the school 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. Candidates for admission to the fifth year credential programs must submit verification of having passed the California Basic Educational Skills Test (CBEST) and verification of having met subject-matter proficiency either by completing a state-approved subject-matter preparation program or by passing the appropriate state-approved subject-matter proficiency examinations before beginning student teaching. Stu-
students can learn more about the testing requirements by attending a credential information seminar and picking up a testing booklet from the Teacher Education Office, 1124 Sproul.

**Program for the Preparation of Teachers**

The Bridge to Teaching Program is a preprofessional program open to undergraduates from all majors who are interested in teaching in California elementary schools. Students fulfill the subject requirement for the California elementary-school teaching credential by taking certain courses, thus waiving the requirement to take the Multiple Subjects Assessment for Teachers test.

Participants can meet certain state requirements before graduation, thus enabling them to apply directly to a credential program. Prospective teachers begin to think pedagogically about subjects they are studying and also gain field experience in schools while receiving an introduction to the profession.

Interested students should contact the Liberal Studies and Interdisciplinary Programs office, (909) 787-2743, as early as possible in their academic career, as the required courses must be completed before finishing the bachelor’s degree.

**Blended Program of Undergraduate Teacher Preparation**

This program, leading to a multiple subjects credential, allows students to complete a credential more quickly and qualifies them for paid teaching in a special program. Students who do not meet subject-matter proficiency through the undergraduate major must pass the PRAXIS Subject Assessment Test in the area in which they plan to teach and the Single Subject Assessment for Teachers (SSAT).

The Single Subject Credential authorizes the teaching of a subject area in a middle or secondary school (grades 7 through 12). Students may earn the Single Subject credential with or without the CLAD emphasis. Students who do not meet subject-matter proficiency through the undergraduate major must pass the PRAXIS Subject Assessment Test in the area in which they plan to teach and the Single Subject Assessment for Teachers (SSAT).

The Education Specialist Credential in Mild/Moderate Disabilities authorizes the teaching of individuals with specific learning disabilities, mental retardation, serious emotional disturbances, and other health impairments.

The Education Specialist Credential in Moderate/Severe Disabilities authorizes the teaching of individuals with autism, mental retardation, both deafness and blindness, serious emotional disturbances, and multiple disabilities.

The specialist (Mild/Moderate or Moderate/Severe Disabilities) candidate may integrate the credential program with an M.A. program in Special Education.

Students are no longer required to earn a basic multiple subjects or single subject credential first but may enter a specialist credential program directly. Both education specialist credentials are two-level credentials, meaning that after the Level I Preliminary Credential is earned, the student has five years to complete a Level II Professional Credential. The second level is completed while the candidate is teaching in a special education setting. The specialist credentials offer the opportunity to integrate some of the credential work with a master’s program; the master’s is normally completed the following year. Eligibility in the integrated master’s program is determined by undergraduate GPA based on the last 90 quarter units, GRE scores, and an interview.

Internships are available in all of the above-mentioned credential programs for candidates with adequate teaching experience. However, the dual credential program in which students earn a special education credential and either single subject or multiple subject credential is available only through a student teaching program.

For more information regarding UCR teaching credential programs call (909) 787-5225. To obtain a list of dates for the credential information seminars, check education.ucr.edu and pick up a 3-Step Book from the Teacher Education Office, 1124 Sproul. The seminars are free, and reservations are not needed.

The combination credential and master's program (M.Ed.) is described in the section on master's degrees.

**Program for the Preparation of Administrators**

Advanced programs for the Preliminary and Professional Administrative Services Credentials are also offered.

Students who have received, or are working toward, advanced degrees in educational administration are eligible to pursue a program of study leading to the Administrative Services Credentials.

UCR is approved by the California Commission on Teacher Credentialing to recommend candidates for both the Preliminary and Professional level Administrative Services Credentials.

**LOWER-DIVISION COURSES**

EDUC 001. Imagining Teaching. (2) Discussion, two 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.

EDUC 002. Looking in Classrooms. (3) Lecture, two hours; field, three hours. Prerequisite(s): EDUC 001; application to the Blended Program of Undergraduate Teacher Preparation. 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.

EDUC 044. Principles of Healthful Living. (4) Lecture, three hours. Use of scientific information, proper attitudes, and health practices in daily living. Major areas include personal, family, and community health, including the effects of alcohol, dangerous drugs and narcotics, degenerative and infectious diseases, and tobacco on the human body.

**UPPER-DIVISION COURSES**

EDUC 100A. Tutorial Teaching: Community Outreach. (2) Lecture, five hours per quarter; field, three hours per week; outside research, fifteen 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, five hours per quarter; field, three hours per week; outside research, fifteen hours per quarter. Prerequisite(s): upper-division stand-
ing; consent of instructor. Guided and sequenced tutorial experiences with children and adolescents enrolled in local schools having cooperative arrangements with the University. Provides opportunities in on- and off-campus 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, one hour. Prerequisite(s): EDUC 100B or EDUC 100C or EDUC 172 or EDUC 174 or upper-division standing. Introductory study of how academic disciplines relate to pedagogy, including developing a personal educational philosophy, discovering ways to communicate knowledge, and reflecting on how a scholar becomes a teacher. Designed for undergraduates contemplating education as a professional career. Graded Satisfactory (S) or No Credit (NC).

EDUC 106. Practicum in Child Development. (4) Lecture; three hours; practicum, three hours. Prerequisite(s): upper-division standing; consent of instructor is required for students repeating the course. Introduction to sociocultural perspectives of child development. Topics include sociocultural theories of development, motivational aspects of learning, technology in education, and school-home linkages. Application of child development theories and research related to them takes place during fieldwork assignments in an after-school, computer-based program for elementary school students. Course is repeatable. Cross-listed with HMIV 106 and PSYC 106.

EDUC 109. Multicultural Education in the American School. (4) Lecture, three hours; outside research, two hours; field, one hour. Prerequisite(s): current enrollment in EDUC 100B. An analysis of the classroom as a microcosm school’s attempt to accommodate diverse ethnic groups and surveys the demographic changes of California with consequences for the multicultural classroom. Includes observation and participation in assigned schools.

EDUC 110. Learning and Instruction. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. The study of stages of intellectual development, principles of learning, the dynamics of human behavior, and cultural differences as they relate to modern curricula and instruction.

EDUC 114. Comparative International Education. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Identification, comparison, and contrast of the educational characteristics of selected developed and developing nations such as Japan, England, Mexico, and Egypt. Hanson, Hartley

EDUC 116. The Exceptional Child. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Identification, comparison, and contrast of the educational characteristics of selected developed and developing nations such as Japan, England, Mexico, and Egypt. Hanson, Hartley


EDUC 120. Guidance in Special Education. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing. The organic and cultural basis of mental retardation. Physical, psychological, emotional, and social development of persons with mental retardation. Covers mild and severe forms of mental retardation. Does not meet requirements for the education specialist credentials. Cross-listed with HMIV 117.

EDUC 129. Educational Assessment of Individuals with Disabilities. (4) Lecture; three hours; outside research, three hours. Prerequisite(s): EDUC 116/106 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. Cross-listed with HMIV 129.

EDUC 130. Mild and Moderate Disabiliies. (4) Lecture, three hours; written outside work, three hours. Prerequisite(s): EDUC 116/106 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. Cross-listed with HMIV 130.

EDUC 131. Moderate and Severe Disabiliies. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): EDUC 116/106 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. Cross-listed with HMIV 131.

EDUC 139. Curriculum and Instruction. (4) Lecture, three hours; laboratory, two hours. Prerequisite(s): EDUC 110 (concurrent). 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 140. Educational Research: Descriptive Statistics. (4) Lecture, three hours; laboratory, variable hours. Statistical notation, tabulating and graphing data, measures of central tendency and variability, normal curve, simple correlations, introduction to inferential process, t-test for means. Illustrated applications in education included.

EDUC 141. Mathematics Education. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): consent of instructor. An examination of contemporary instructional strategies relating to mathematics education. Includes an examination of thinking skills and problem solving strategies applicable to number theory, logic patterns and functions, statistics and probability, geometry and algebra.

EDUC 142. Development of Scientific Reasoning in Young Children. (4) Lecture, three hours; individual study, two hours; field, one hour. Prerequisite(s): upper-division standing. Examines how to effectively teach science to elementary school children. Critically analyzes what it means to think scientifically, the nature of children’s scientific reasoning, different views of appropriate goals for children’s science education, and current science curricula.

EDUC 146. Educational Perspectives on the Chicano. (4) Lecture, three hours; term paper, three 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 ENST 146.

EDUC 150. Teacher Education Lecture Series. (1) Lecture, ten hours per quarter. Prerequisite(s): upper-division standing. Presentations, demonstrations and discussions on timely topics in public school teaching.

EDUC 172. Reading and Language Development. (5) Lecture, three hours; outside research, three hours; field, three hours. Prerequisite(s): EDUC 100B or equivalent; upper-division standing or consent of instructor. An introduction to reading and language development: theoretical models of reading, linguistics and language development; methods and materials; children’s and adolescents’ literature, reading in the content areas, individual differences, and measuring and evaluating in reading. Includes observation and participation in assigned schools.

EDUC 173. Teaching Literature to Children and Adolescents. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing. Explores developmental methods appropriate for teaching literature to children and adolescents. Topics include story telling, story reading, pictorialization, dramas 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, three hours; outside research, three hours; field, three hours. Prerequisite(s): EDUC 100B or equivalent; upper-division standing or consent of instructor. 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 175. Problems in Teaching Reading. (4) Lecture, one hour; field, one hour. Prerequisite(s): EDUC 172. EDUC 175A (EDUC 173 or EDUC 174 may be taken concurrently). Supervised field work on problems in teaching reading and writing in various settings, such as in the classroom and in reading laboratories. Requires analysis, planning, execution and evaluation of programs and strategies for solving reading problems. Students are required to reserve nine hours each week for participation in assigned school.

EDUC 177A. Language Development in Content Areas. (4) Lecture, three hours; outside research, two hours; field, one hour. Prerequisite(s): LING 020 or LING 021 or equivalent. Study of second language acquisition and models of teaching strategies for English language development in content area instruction. Includes observation and participation in assigned schools.

EDUC 177B. Language Development in Content Areas. (3) Lecture, two hours, field, two hours; outside research, one 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.

EDUC 190. Special Studies. (1-5) Outside research, three to fifteen 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.

EDUC 200. Human Differences. (4) Lecture, three hours; research, three hours. Prerequisite(s): EDUC 140 and EDUC 212 or equivalent. Dimensions of individual differences, varieties of group differences, and factors producing differences in development.

EDUC 201A. Theories and Research in Reading and Writing. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Critical evaluation of linguistic,
cognitive, social, and cultural aspects of reading and writ-
ing, as gleaned from research, and reading and writing research methods.

EDUC 201B. Theories and Issues in Literacy. (4)
Seminar; three hours; outside research, three hours. Pre-
requisite(s): EDUC 201A or consent of instructor. Exam-
ination of literacy development in individuals and in society;
developmental studies; development of cultural knowledge;
development of communication skills; role of language dif-
fences in the problems of learning to read and write; oral
language arts; emergent literacy; and writing development.

EDUC 202. Theories of Education. (4)
Lecture; three hours. Prerequisite(s): consent of instructor.
Analysis of the principal contemporary theories affecting
the development of educational policy.

EDUC 203. History of American Education. (4)
Lecture; three hours. Prerequisite(s): consent of instruc-
tor. A study of American educational history from 1830 to the
present.

EDUC 204. The School as a Social System. (4)
Lecture; three hours. A study of intra-school relationships;
administration, professional bureaucracy; faculty and stu-
dent relations. The classroom itself will be examined as a
social-psychological system.

EDUC 205. School-Community Relations. (4)
Lecture; three hours; outside research, three hours. Pre-
requisite(s): graduate standing or consent of instructor.
Examines the structures of communication that help shape
the relationships between schools and their com-
munities. 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
Districts. (4)
Lecture; three hours. Examination of political
power, representation, influence, decision-making and
inter-governmental relations in the public schools.

EDUC 206B. Politics of Education: State and
Federal. (4)
Lecture, three hours. Examination of political
power, representation, influence, decision-making and
inter-governmental relations in the public schools.

EDUC 207. Educational Policy. (4)
Lecture; three hours; outside research, three hours. Pre-
requisite(s): graduate standing or consent of instructor. Exam-
nines twentieth-century American educational policy covering
major issues underlying model 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; four hours. Examination of the legal
processes governing educational policy, including signifi-
cant laws, legal principles, recent litigation, controlling
relationships of schools to student and teacher rights and
duties, administrative behavior, etc. Focuses on connect-
ions between legislative and judicial action and the social,
political and economic forces affecting education.

EDUC 209A. Education Policy Analysis. (4)
Lecture; three 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 psy-
chology, and history.

EDUC 209B. Education Policy Analysis. (4)
Lecture, three hours. Prerequisite(s): consent of instructor.
Theoretical and methodological foundations for education
policy analysis. Focuses on the formulation and testing of hypotheses regarding
policy formation and effects.

EDUC 210. Theories of Development. (4)
Lecture, three hours; outside research, three hours. Pre-
requisite(s): graduate standing or consent of instructor. A
critical consideration of human development in the con-
text of current research and theoretical models with
implications for education in the public school setting.

EDUC 211A. Cognitive Development. (4)
Lecture; three hours; outside research, three hours. Prereq-
site(s): graduate standing or consent of instructor. Survey
course on children’s development and the appli-
cation of cognitive-developmental theory (Vygotsky, Piaget,
information processing) and research to children’s learn-
ing and academic achievement.

EDUC 211B. Social Development. (4)
Lecture; three hours; outside research, three hours. Prereq-
site(s): graduate standing or consent of instructor. Survey
social development during childhood and adolescence.
Topics include individuality and self, peer relations, adult-
child relations, 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, three hours; consultation, one hour. Prerequisite(s): EDUC 140 or
consent of instructor. Principles of scientific research,
orientation to the different methods including historical,
survey, descriptive, correlational, experimental, quasi-
experimental; internal and external threats to validity.

EDUC 213. Factor Analysis for Test Construc-
tion. (4)
Lecture; three hours; outside research, three hours.
Prerequisite(s): EDUC 242 or consent of instruc-
tor. Statistical methods of analysis applied to the
development of educational tests. Methods of extracting
factors from test items and subscores concerned with
educational measurement. Orthogonal and oblique meth-
ods of rotation emphasized. Reliability and validity in the
context of factor analysis discussed.

EDUC 214. Educational Research: Statistical
Inference and Hypothesis Testing. (4)
Lecture; three hours; laboratory, variable hours.
Prerequisite(s): EDUC 140. Sampling distributions of Z, X2, t, F
in selected tests of significance, one-way fixed effects
ANOVA, planned multiple comparisons, 2-way
ANOVA, fixed, random, mixed models and tests,
simple and multiple regression. Illustrated applications in education
included.

EDUC 215. Educational Research: Experimental
Design. (4)
Lecture; three hours; laboratory, variable hours.
Prerequisite(s): EDUC 140, EDUC 212, EDUC 214.
Focus on common designs used in education including
repeated measures. Emphasis on design application and appropri-
ate statistical analysis for education; ANOVA.

EDUC 216. Educational Research: Advanced Statis-
tics. (4)
Lecture, three hours; laboratory, variable hours.
Prerequisite(s): EDUC 212, EDUC 214, EDUC 215.
Study of advanced statistical procedures frequently used in
educational research. Topics include MANOVA, simple and
multiple regression, discriminant function analysis, factor
analysis.

EDUC 217. Single-Case Experimental Design. (4)
Lecture; three hours; outside research, three hours.
Prerequisite(s): admission to Ph.D. program in School
Psychology or Special Education; or consent of instructor.
Logic, applications, and analytic techniques for single-case experimental designs in naturalistic settings.
Specific designs include withdrawal, multiple baseline, alternating treatments, changing criterion, and multilevel experi-
mental designs. Emphasizes problems of using and chang-
ing single-case methods of factor analysis applied to
research.

EDUC 218. Problems in Evaluation. (4)
Lecture; three hours. Prerequisite(s): EDUC 290A. A study of poli-
cies and procedures which define program evaluations in
education including evaluation models, formative and
summative strategies, evaluation designs and analyses, and
ethical issues.

EDUC 219. Classroom and School Assessment. (4)
Lecture; three hours; outside research, three hours.
Prerequisite(s): EDUC 140 or consent of instructor.
Survey course in classroom and school assessment. Basic
principles of measurement including test administration,
tive bargaining, and the use of management information systems as tools for informed decision making.

EDUC 229. Leadership in School Organizations. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): EDUC 230A recommended. Covers analysis of curriculum organization, design, and implementation.

EDUC 231 (E-Z). Special Problems in Curriculums and Instruction. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): EDUC 139 or equivalent. Special problems in the curriculum area as follows: E. Curriculum Inquiry; G. Excellence in Teaching; H. Multicultural Programs in Reading and Language Arts; J. Questioning and Teaching.

EDUC 232. Teaching Strategies. (4) Lecture, three 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. School Learning Environment. (4) Lecture, three hours. Prerequisite(s): admission to a graduate degree program, teaching credential and teaching experience. The course will consider (1) the dimensions and characteristics of school learning environment; (2) the role of teaching models, strategies, programs, policies, and interpersonal relationships in establishing the school learning environment; and (3) the impact of the learning environment on student motivation, attitude formation, and achievement.

EDUC 234. Curriculum Differentiation. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): consent of instructor. A theoretical and methodological analysis of curriculum differentiation. Describes and critically analyzes the processes and effects of providing different curricula for diverse student groups in schools.

EDUC 235. Classroom Processes. (4) Lecture, three hours; consultation, one hour. Analysis and synthesis of theories and empirical studies of selected classroom processes, including question-answer exchanges and discussions.

EDUC 236. School and Society. (3) Lecture, two hours; outside research, three hours. Prerequisite(s): consent of instructor. First-year standing in the Ph.D. program in Education. 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, three hours; outside research, three hours. Prerequisite(s): EDUC 212 or consent of instructor. Examinations approaches guiding research on teaching, such as process-product, classroom ecology, ethnography, and teacher cognition.

EDUC 240. Educational Psychology. (4) Lecture, three hours; outside research, three 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. (3) Lecture, two hours; outside research, three hours. Prerequisite(s): first-year standing in the Ph.D. program in Education. Emphasizes use of these measures for screening and classification decisions and psychological report writing. Emphasis is given to the inferential errors that human beings make by employing intuitive strategies and overlooking evidence.

EDUC 241B. Inquiry and Research Methods. (3) Lecture, two hours; outside research, three hours. Prerequisite(s): EDUC 241A; first-year standing in the Ph.D. program in Education. Emphasizes the nature of inquiry and research in educational studies, including the formation of questions and qualitative and quantitative research methods. Focuses on analysis of qualitative data and introduces quantitative methods. Students conduct small-scale empirical studies. Required of first-year Graduate School of Education doctoral students.

EDUC 241C. Inquiry and Research Methods. (3) Lecture, two hours; outside research, three hours. Prerequisite(s): EDUC 241A; EDUC 241B; 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 and basic research methods. Focuses on analysis of quantitative data and comparisons of qualitative and quantitative methods. Students conduct small-scale empirical studies. Required of first-year School of Education doctoral students.

EDUC 242. Advanced Test Theory. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): EDUC 214; EDUC 219; or consent of instructor. Examines principles of classical and modern test theory including classical test theory, generalizability theory, and item response theory. Emphasis on statistical bases of these theories.

EDUC 243. Student Metacognition and Self-Regulated Learning. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): consent of instructor. Examines theoretical perspectives and research approaches for studying students’ metacognition and self-regulation and instructional interventions that 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. (3) Lecture, two hours; outside research, three 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) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Critical analyses of research in the various areas of education. Course may be repeated with separate letter designation.


EDUC 247. Theoretical Perspectives on Learning. (4) Lecture, three hours; outside research, three 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). Psychoeducational Assessment. (4) Lecture, three hours. Prerequisite(s): consent of instructor. E. Cognitive Functions; F. Personality Assessment; G. Case Study Methods.

EDUC 249. Discourse Analysis for Education. (4) Seminar, three hours; outside research, three 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, one hour. Prerequisite(s): graduate standing or consent of instructor. A series of presentations by guest, 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, three hours; outside research, three 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, three hours; outside research, three 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. Administrative Judgement in Education. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): doctoral standing or consent of instructor. Examination of the process by which educational administrators make judgments. Emphasis is given to the errors that human beings make by employing intuitive strategies and overlooking evidence.

EDUC 254A. School Psychological Assessment I. (4) Seminar, three hours; practicum, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Administration, scoring, and interpretation of individual measures of intelligence and academic aptitude. Emphasizes use of these measures for screening and classification decisions and psychological report writing.

EDUC 254B. School Psychological Assessment II. (4) Seminar, three hours; practicum, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Administration, scoring, and interpretation of individual measures of intelligence and academic aptitude. Emphasizes use of these measures for screening and classification decisions and psychological report writing.

EDUC 254C. Behavioral Assessment. (4) Seminar, three hours; practicum, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Procedures and techniques of behavioral assessment including systematic behavioral observations, curriculum-based assessment, behavior rating scales, and self-monitoring. Topics include conceptual issues in applying traditional psychometric theories to behavioral

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EDUC 254D. Nonbiased Assessment. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Methods and procedures for the scientific study of test bias. Different definitions of test bias and specific data analysis methods for detecting bias are discussed. Court cases and legal arguments for and against test bias are presented with emphasis on minority groups.

EDUC 255A. Principles of Academic Behavior Intervention. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. 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, three hours; individual study, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. 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 255C. Child Behavior Therapy. (4) Seminar, three hours; practicum, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Principles derived from neo-behavioristic and social learning theories applied to treat children's problems. Professional ethics, practice, and responsibility in clinical child behavior therapy.

EDUC 256. Advanced Seminar on Learning Disabilities. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): EDUC 140, EDUC 212 or equivalents; or consent of instructor. Critical evaluation of theory and research in the field of learning disabilities. Data-based project reflecting original research required.

EDUC 257. Language, Culture, and Education. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): consent of instructor. Examines the language of communication and classroom management in schools. Exploration of theories related to urban and suburban educational environments.

EDUC 258. Doctoral Seminar in Educational Research. (4) Seminar, three hours; consultation, one hour. Prerequisite(s): master's degree. Construction of a theoretical framework for curriculum development.

EDUC 259. Research Seminar. (2) Seminar, two hours. Prerequisite(s): EDUC 140, EDUC 212, EDUC 214 or consent of instructor. Research reports on topics in educational psychology; research in curriculum and instruction; and research in educational administration. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

EDUC 260. History of Curriculum. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): consent of instructor. A historical study of textbooks and other curriculum materials that have been developed in response to the political, social, cultural, and economic forces in the United States from 1789 to the present.

EDUC 261 A. School Psychological Consultation. (4) Seminar, three hours; practicum, three 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 261 B. Advanced Topics in School Psychological Consultation. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Analysis and discussion of current research in school-based consultation. Emphasis on research strategies to answer difficult consultation questions. Oral presentations of student-designed research proposals required. Topics vary.

EDUC 267. Achieving Test Motivation. (4) Seminar, three hours; outside research, three 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 achievement 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 267 A. Seminar in School Organization and Management. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): doctoral standing or consent of instructor. Examines critical issues and processes associated with management at the national, state, and local levels. Emphasis given to concerns involving educational decision making, socialization, and human resources management.

EDUC 268. Professional School Psychology. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology. Examination of psychological assessment information. Role of psychological interventions in addressing individual needs.

EDUC 269. Education and Treatment of Students with Special Medical, Genetic, and Physiological Needs. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): admission to Ph.D. program in School Psychology or Special Education; or consent of instructor. Examines the effects of genetic, medical (e.g., disease, injury), physiologic, and pharmacologic variables on the developmental, behavioral, and learning characteristics of children. Emphasizes the need to address these variables in childhood assessment and intervention practices.

EDUC 270. The Dynamic Assessment of Mental Abilities. (4) Seminar, three hours; outside research, three 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 technologies, and technology.

EDUC 271. The School Principal: Tools for Managerial Problems. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): consent of instructor. Analysis of written texts and research strategies to answer difficult consultation questions. Oral presentations of student-designed research proposals required. Topics vary.

EDUC 272. Sociolinguistics and Educational Processes. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): consent of instructor. Analysis of written texts and research strategies to answer difficult consultation questions. Oral presentations of student-designed research proposals required. Topics vary.
EDUC 280. The Politics of Educational Decision Making. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate or professional standing. Analysis of the political climate affecting American schools. Topics include influences on educational policy, programs, and practice.

EDUC 280R. The Classroom. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate or professional standing. Examines anthropological and sociological theory and research on the organization and structure of and practices used in K-12 classrooms.

EDUC 280S. The School. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate or professional standing. Analysis of the school as a formal organization, a place of work for teachers, and a place of learning for students. Examines the internal and external context of schools.

EDUC 281. History of Educational Policy and Reform. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): EDUC 139, EDUC 172, concurrent enrollment in EDUC 346B or EDUC 358B; or consent of instructor. 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, three hours; outside research, three hours. Prerequisite(s): EDUC 139, EDUC 172; concurrent enrollment in EDUC 356C or EDUC 358C or EDUC 345A or EDUC 345B. 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; three hours; outside research, three hours. Prerequisite(s): admission to the Ph.D. 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, three hours; outside research, three hours. Prerequisite(s): admission to the Ph.D. program. Focuses on the relationship between schooling and social stratification, with special attention to the influence of class, race, and ethnicity on academic achievement.

EDUC 285. Curriculum Theory and Instructional Processes. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): EDUC 109, EDUC 110, EDUC 110M/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; S. Secondary Science. T. Portraits of Teaching.

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. (1-6) Consultation, one to six hours. Prerequisite(s): graduate or professional standing. A program of studies designed to meet individual requirements. Does not meet unit requirements for M.A. degree. Graded Satisfactory (S) or No Credit (NC). Repeatable up to 18 units prior to successful completion of Ph.D. qualifying examinations.

EDUC 297. Directed Research. (1-6) Research, three to eighteen hours. Prerequisite(s): advanced graduate or professional standing. Directed research on selected problems in education. Graded Satisfactory (S) or No Credit (NC).

EDUC 298. Internship in School Psychology. (4) Internship, thirty-five hours. Prerequisite(s): admission to Ph.D. program in School Psychology. Supervised internship is repeated for four consecutive quarters for a total of not less than 1,500 hours, half of which must be in a school setting. Credit for internship will not be granted to students with less than 72 quarter hours of successfully completed graduate-level course work. Two hours per week is devoted to direct, face-to-face supervision of each intern. 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, one to six hours. Prerequisite(s): advancement to candidacy for the master's or doctoral degree. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

EDUC 302. College Teaching Practicum. (1-6) Practicum, three to eighteen 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, two hours; field, six hours. Prerequisite(s): a Level I Education Specialist Credential: Mild/Moderate Disabilities. Prepares teacher candidates to teach students with mild/moderate disabilities and who are placed in the Mild/Moderate Specialist program. Provides hands-on experiences working with students with mild/moderate disabilities. Includes observation and teaching experience in multiple placements in schools and classrooms. Graded Satisfactory (S) or No Credit (NC).

EDUC 303B. Level II Summative Evaluation: Mild/Moderate Specialist. (2) Lecture, one hour; field, three 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, two hours; field, six hours. Prerequisite(s): a Level I Education Specialist Credential: Moderate/Severe Disabilities. Prepares teacher candidates to teach students with moderate/severe disabilities and who are placed in the Moderate/Severe Specialist program. Provides hands-on experiences working with students with moderate/severe disabilities. Includes observation and teaching experience in multiple placements in schools and classrooms. Graded Satisfactory (S) or No Credit (NC).

EDUC 304B. Level II Summative Evaluation: Moderate/Severe Specialist. (2) Lecture, one hour; field, three 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, eight hours per quarter; laboratory, three hours per quarter; field, three hours per quarter. Prerequisite(s): admission to a teaching credential program. Introduction to technology in education. Prepares future teachers to effectively utilize technology 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, eight hours per quarter; laboratory, three hours per quarter; field, three hours per quarter. Prerequisite(s): admission to a teaching credential program. 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).
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 331. Bilingual/Cross-cultural Methods of Teaching. (5) Lecture, five hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 172; concurrent enrollment in EDUC 356B or EDUC 358A. Study and application of instructional processes appropriate for use in the bilingual/cross-cultural classroom. Emphasis is on integrating English and Spanish into the program. Topics include material assessment, performance objectives, curriculum considerations, knowledgeable use of teacher aides, testing, and evaluation. Graded Satisfactory (S) or No Credit (NC).

EDUC 332. Advanced Instructional Procedures for the Multiple Subjects Classroom. (5) Lecture, five hours. Prerequisite(s): concurrent enrollment in EDUC 338B; admission to intern teaching program. Advanced study and application of instructional processes appropriate for use in the multiple subjects classroom. Topics include oral communication skills, curriculum planning, and instructional strategies. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 332 or EDUC 333.

EDUC 333. Advanced Bilingual/Cross-cultural Methods of Teaching. (5) Lecture, five hours. Prerequisite(s): concurrent enrollment in EDUC 358B; admission to intern teaching program. Advanced study and application of instructional processes appropriate for use in the bilingual/cross-cultural classroom. Emphasis is on integrating English and Spanish into the program. Topics include material assessment, performance objectives, curriculum considerations, knowledgeable use of teacher aides, testing, and evaluation. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 332 or EDUC 333.

EDUC 336A. Supervised Teaching in the Elementary School. (3) Outside research, three hours; field, six hours. Prerequisite(s): admission to a teaching credential program. 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. (6) Supervised teaching, eighteen hours (including preparation). Prerequisite(s): EDUC 110, EDUC 139, EDUC 172; concurrent enrollment in EDUC 282A and EDUC 344B. Supervised teaching in the multiple subject classroom. Required of all candidates for elementary teaching 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. (12) Supervised teaching, thirty-six hours (including preparation). Prerequisite(s): EDUC 110, EDUC 139, EDUC 172, EDUC 336A, EDUC 336B (EDUC 350 must be taken concurrently). Supervised teaching in the multiple subject classroom. Required of all candidates for the elementary teaching credential. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336B or EDUC 338C.

EDUC 338A. Intern Teaching in the Elementary School. (10) Field, thirty hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 172; admission to intern teaching program; concurrent enrollment in EDUC 282A or EDUC 344A. 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. (10) Field, thirty hours. Prerequisite(s): EDUC 338A, EDUC 338B; admission to intern teaching program; concurrent enrollment in EDUC 352A or EDUC 355. Intern teaching in the multiple subjects classroom. Required for the Multiple Subjects Internship Credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 339C. Intern Teaching in the Elementary School. (10) Field, thirty hours. Prerequisite(s): EDUC 338A, EDUC 338B. Intern teaching in the elementary classroom. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 336B or EDUC 338B.

EDUC 340A. Instructional Processes for Students with Mild Handicaps and Behavior Disorders. (5) Lecture, five hours. Prerequisite(s): admission to the Specialized Preparation Program. Development and learning needs of handi capped students: curriculum, procedures, and materials. Includes participation in public school programs.

EDUC 340B. Instructional Processes for Severely Handicapped Students. (5) Lecture, three hours; laboratory, five 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, two hours. Prerequisite(s): concurrent enrollment in EDUC 336C or EDUC 338A or consent of instructor. Analysis of instructional processes used in multiple subject classrooms. Topics include classroom management, curriculum planning, instructional strategies, and oral and written communication skills. Graded Satisfactory (S) or No Credit (NC).

EDUC 344B. Multiple Subjects Credential Seminar. (2) Seminar, two hours. Prerequisite(s): EDUC 139, EDUC 172, EDUC 344A; concurrent enrollment in EDUC 336B or EDUC 338B. Analysis of instructional processes used in multiple subject 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. Graded Satisfactory (S) or No Credit (NC).

EDUC 344C. Multiple Subjects Credential Seminar. (2) Seminar, two hours. Prerequisite(s): EDUC 139, EDUC 172, EDUC 344B; concurrent enrollment in EDUC 346C or EDUC 348B. Analysis of instructional processes used in multiple subject 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. Graded Satisfactory (S) or No Credit (NC).

EDUC 345A. Supervised Student Teaching in a Special Class for Individuals with Mild/Moderate Disabilities. (12) Field, thirty-six hours. Prerequisite(s): admission to a special education credential program; EDUC 340A (may be taken concurrently). Student 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 345B. Supervised Student Teaching in a Special Class for Individuals with Moderate/Severe Disabilities. (12) Field, thirty-six hours. Prerequisite(s): admission to a special education credential 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 347A. Supervised Intern Teaching in a Special Class for Individuals with Moderate/Severe Disabilities. (7) Field, twenty-one hours. Prerequisite(s): admission to an internship program in moderate/severe disabilities; EDUC 340B. 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. (7) Field, twenty-one hours. Prerequisite(s): admission to an internship program in moderate/severe disabilities; EDUC 340B. 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 Intern Teaching Seminar. (2) Seminar, two hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174; concurrent enrollment in EDUC 378A. An applied analysis of instructional problems encountered by interns in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 348A or EDUC 349A.

EDUC 348B. Single Subject Intern Teaching Seminar. (2) Seminar, two hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174; concurrent enrollment in EDUC 378A. An applied analysis of instructional problems encountered by interns in the single subject classroom. Topics include basic curriculum, classroom management, interpersonal relationships, self-evaluation, and professional competencies. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 348A or EDUC 349B.

EDUC 348C. Single Subject Intern Teaching Seminar. (2) Seminar, two hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174, EDUC 348B; concurrent enrollment in EDUC 378C. An applied analysis of instructional problems encountered by interns in the single subject classroom. Topics include basic curriculum, class-
room management, interpersonal relationships, self-evaluation, and professional competencies. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 349C or EDUC 349E.

EDUC 349A. Single Subject Student Teaching Seminar. (2) Seminar, two hours. Prerequisite(s): concurrent enrollment in EDUC 376A. An analysis of applied problems in the process of instruction in the single subject classroom, including interpersonal relationships. Graded Satisfactory (S) or No Credit (NC).

EDUC 349B. Single Subject Student Teaching Seminar. (2) Seminar, two hours. Prerequisite(s): concurrent enrollment in EDUC 376B. An analysis of applied problems in the process of instruction in the single subject classroom, including interpersonal relationships. Graded Satisfactory (S) or No Credit (NC).

EDUC 349C. Single Subject Student Teaching Seminar. (2) Seminar, two hours. Prerequisite(s): concurrent enrollment in EDUC 376C or EDUC 345A or EDUC 345B. An analysis of applied problems in the process of instruction in the single subject classroom, including interpersonal relationships. Graded Satisfactory (S) or No Credit (NC).

EDUC 350. Multiple Subject Student Teaching Seminar. (3) Seminar, three hours. Prerequisite(s): concurrent enrollment in EDUC 356G or EDUC 356C or EDUC 354B. An analysis of applied problems in the process of instruction in the multiple subject classroom, including interpersonal relationships. Graded Satisfactory (S) or No Credit (NC).

EDUC 351. Seminar in Bilingual Student Teaching. (3) Seminar, three hours. Prerequisite(s): must be taken concurrently with EDUC 356G or EDUC 356C. An analysis of applied problems in the process of instruction in the multiple subject classroom, including interpersonal relationships. Graded Satisfactory (S) or No Credit (NC).

EDUC 352. Multiple Subjects Intern Teaching Seminar. (3) Seminar, three hours. Prerequisite(s): concurrent enrollment in EDUC 358C. An applied analysis of instructional problems encountered by interns in the multiple subjects classroom. Includes discussion of interpersonal relationships. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of EDUC 350, EDUC 351, EDUC 352, or EDUC 353.

EDUC 353. Seminar in Bilingual Intern Teaching. (3) Seminar, three hours. Prerequisite(s): concurrent enrollment in EDUC 358C. An applied analysis of instructional problems encountered by interns in the bilingual classroom. Topics include basic curriculum, classroom management, interpersonal self-evaluation, and professional competencies as they apply to the bilingual classroom. Graded Satisfactory (S) or No Credit (NC).

EDUC 354A. Orientation to Educational Administration and Policy. (2) Seminar, fifteen hours per quarter; field, one and one-half hours per week. 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. (2) Seminar, fifteen hours per quarter; field, one and one-half hours per week. 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. (4-8) Lecture, three hours; field experience, three to fifteen 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, two hours; field, six 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, two hours; field, six 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, three hours; field work, ten to fifteen hours. Prerequisite(s): EDUC 365A-EDUC 365B. Possession of California Preliminary Administrative Services Credential or equivalent. An applied analysis of problems in the single subject classroom, including interpersonal relationships. Graded Satisfactory (S) or No Credit (NC).

EDUC 367A. Supervised Teaching in the Secondary School. (3) Field, nine hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174, EDUC 376A; concurrent enrollment in EDUC 349B. Supervised teaching in the single subject classroom. Required of all candidates for the secondary teaching credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 367B. Supervised Teaching in the Secondary School. (6) Outside research, three hours; field, fifteen hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174, EDUC 376A; concurrent enrollment in EDUC 349B and in one segment of EDUC 191 (E-Z). Supervised teaching in the single subject classroom. Required of all candidates for the secondary teaching credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 376C. Supervised Teaching in the Secondary School. (12) Field, thirty-six hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174, EDUC 376A, EDUC 376B; concurrent enrollment in EDUC 349C. Supervised teaching in the single subject classroom. Required of all candidates for the secondary teaching credential. Graded Satisfactory (S) or No Credit (NC).

EDUC 378A. Intern Teaching in the Secondary School. (10) Field, thirty hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174; 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. (10) Field, thirty hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174, EDUC 378A; 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. (10) Field, thirty hours. Prerequisite(s): EDUC 110, EDUC 139, EDUC 174, EDUC 378A; 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.

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**Education Abroad Program**

**Abbreviation:** EAP

**John A. Marcum, Ph.D., Director**

**Universitywide Program Office, UC Santa Barbara**

**UCR Representatives**

Robert W. Patch, Ph.D., Director, EAP

Diane Eton, Director,

**International Services Center Office, Watkins House**

**International Services Center**

(909) 787-4113

internationalcenter.ucr.edu

**Purposes**

Recognizing its role in preparing tomorrow's citizens, the Education Abroad Program (EAP) offers students the opportunity to experience a different culture while earning UC credit. Established in 1961, the EAP serves students at all UC campuses and is centrally administered from UC Santa Barbara. International study options are available in 33 countries throughout the world, and more than 3,500 UC students annually take part in the program. One of the distinctive features of EAP is the emphasis placed on the full integration of the UC students into the curricular and extra-curricular life of the host university.

Most of the program study centers are direct- ed by UC faculty member in residence. The directors and staff advise students on academic, cultural, social, and personal matters, and the centers serve as information centers for cultural and social opportunities.

Benefits of the international experience affect a student's academic achievement, personal life, and future career. Stimulation of general intellectual development, enhancement of independent study and second language skills, an increase of self-awareness, clarification of life purposes, and a broadening and deepening of personal values are a few of the advantages gained from this opportunity.

**Academic Program**

See the charts on the following pages for partner universities and study options. The academic programs at each center vary widely. Students at most locations are directly enrolled in the regular, foreign university system. Participants may take courses for credit in their UC major 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 and short-term programs. Students who want to gain basic foreign language skills have Language and Society options. Thematic options include Engineering in Hong Kong and Japan, Environmental Sciences in Australia, 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.
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<td>The University of Adelaide</td>
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<td>Brisbane—The University of Queensland</td>
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<td>Canberra—The Australian National University</td>
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<td>Hobart—The University of Tasmania</td>
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<td>Melbourne—La Trobe University; Monash University</td>
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<td>The University of Melbourne</td>
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<td>Perth—The University of Western Australia, Perth</td>
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<td>Sydney—The University of New South Wales; University of Sydney</td>
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<td>Wollongong City—The University of Wollongong</td>
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<td>Year³ Programs</td>
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<td>Fall, Spring Environmental Science and Biology Program</td>
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<td>Fall Marine Science Program</td>
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<td><strong>Barbados</strong> — Cave Hill—University of the West Indies</td>
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<td>Fall, Year Programs</td>
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<td><strong>Brazil</strong> — Rio de Janeiro—Pontifical Catholic University of Rio de Janeiro</td>
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<td>Spring, Year³ Programs</td>
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<td><strong>Canada</strong> — Vancouver—The University of British Columbia</td>
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<td>Fall, Year Programs</td>
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<td>Concepción—University of Concepción</td>
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<td>Santiago—Pontifical Catholic University of Chile; University of Chile</td>
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<td>Spring, Year³ Programs</td>
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<td>Fall Spanish Language and Latin American Culture Program</td>
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<td><strong>China</strong> — Beijing—Beijing Normal University; Peking University</td>
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<td>Intensive Chinese Summer Program</td>
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<td><strong>Costa Rica</strong> —</td>
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<td>Monteverde—Monteverde Institute</td>
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<td>San José—University of Costa Rica</td>
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<td>Spring, Year³ Programs</td>
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<td>Fall, Spring Tropical Biology Programs</td>
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<td><strong>Denmark</strong> — Copenhagen—Denmark's International Study Program; University of Copenhagen</td>
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<td>Summer Intensive Language Program</td>
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<td>Fall, Year Programs</td>
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<td>Fall, Spring, Year Architecture Programs</td>
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<td><strong>Egypt</strong> — Cairo—The American University in Cairo</td>
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<td><strong>France</strong> —</td>
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<td>Grenoble—University of Grenoble</td>
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<td>Lyon—École Normale Supérieure; University of Lyon</td>
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<td>Paris—American University of Paris, École Normale</td>
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<td>Supérieure, rue d'Ulm; Institut d'Etudes Politiques (Sciences Po); Paris Center for Critical Studies, Paris UC Center</td>
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<td>Toulouse—University of Toulouse</td>
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<td>Year Programs</td>
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<td>Spring program, Bordeaux</td>
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¹ Not all study options are offered at all universities. Check internationalcenter.ucr.edu or visit the International Services Center for program details.
² Intensive language programs precede programs in which course work is not in English. Programs identified require language study during the term or year.
³ Programs begin the academic year in the winter.
**Summary of EAP Partner Universities and Study Options**

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<th>All/Some Courses in English</th>
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<td>Göttingen—Georg-August University</td>
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<td>Potsdam—University of Potsdam</td>
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<th>Ghana —</th>
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<tr>
<td>Hong Kong University of Science and Technology</td>
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<td>University of Hong Kong</td>
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<td>Fall, Spring, Year Programs</td>
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<td>Dublin—University of Dublin</td>
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<td>Galway City—National University of Ireland, Galway</td>
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<td>Year Programs</td>
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<th>Israel — suspended for Fall 2002</th>
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<td>Beersheva—Ben Gurion University of the Negev</td>
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<td>Jerusalem—The Hebrew University of Jerusalem</td>
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<td>Kibbutz Ketura—Arazi Institute for Environmental Studies</td>
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<th>Italy —</th>
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<td>Milan—University of Commerce Luigi Bocconi, Brera Academy of Fine Arts</td>
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1 Not all study options are offered at all universities. Check [internationalcenter.ucr.edu](http://internationalcenter.ucr.edu) or visit the International Services Center for specific program details.
2 Intensive language programs precede programs in which course work is not in English. Programs identified require language study during the term or year.
3 Programs begin the academic year in the winter.

Tropical Biology in Costa Rica, Asian Development Studies, 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, Israel, 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. 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. 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. Students are...
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<th>Graduate Participation Encouraged</th>
<th>Applications due in months below</th>
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<td>Osaka—Osaka University</td>
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<td>Sendai—Tohoku University</td>
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<td>Tokyo—International Christian University; Hitotsubashi University; Keio University, Sophia University; Tokyo Institute of Technology; The University of Tokyo (Hongo and Komaba campuses); Waseda University</td>
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<td>Tsukuba Science City—University of Tsukuba</td>
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<td>Tsuru City—Tsuru University</td>
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<td>Yokohama—Meiji Gakuin University</td>
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<td>Year Programs</td>
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<td>Year Engineering Programs in Japanese</td>
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¹ Not all study options are offered at all universities. Check internationalcenter.ucr.edu or visit the International Services Center for specific program details.
² Intensive language programs precede programs in which course work is not in English. Programs identified require language study during the term or year.
³ Programs begin the academic year in the winter.
⁴ Utrecht University only.
expected to complete a minimum of 36 units during the academic year in addition to units earned in the intensive language program. Subsequent fulfillment of major and degree requirements depends upon UC departmental and campus criteria.

**Eligibility and Selection**
Selection of UC undergraduates is subject to the following minimum qualifications for most programs: 3.00 cumulative grade point average from the time of application through departure; junior standing by departure (except for specific programs); support of the UCR Selection Committee; and completion with a “B” average of any required language courses. In addition to academic criteria, the Selection Committee attaches much importance to indications of the student’s seriousness of purpose, maturity, knowledge of the host country and the United States, and the capacity to adapt to the experience of study abroad. Prior to departure, selected students are required to obtain clearance from the university’s Student Health Service and, for purposes of placement, to take a language proficiency test where applicable.

Eligible transfer students must have completed at least one quarter in residence in the University of California prior to EAP participation. Graduate students who have completed at least

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### Summary of EAP Partner Universities and Study Options

<table>
<thead>
<tr>
<th>Countries</th>
<th>Universities</th>
<th>Language Study Participation</th>
<th>Fall, Spring Programs in Hispanic Studies</th>
<th>Fall, Spring Language and Society Program</th>
<th>Year Programs</th>
<th>Graduate Participation Encouraged</th>
<th>Applications due in months below</th>
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<td>Acalá de Henares—University of Acalá de Henares</td>
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<td>Barcelona—Autonomous University of Barcelona; University of Barcelona</td>
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1 Not all study options are offered at all universities. Check internationalcenter.ucr.edu or visit the International Services Center for specific program details.
2 Intensive language programs precede programs in which course work is not in English. Programs identified require language study during the term or year.
3 Programs begin the academic year in the winter.
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 participants pay the same UC and campus fees and are responsible for room and board, books and academic supplies, and personal expenses. The only additional costs directly related to the program are round-trip transportation, 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 receiving state and federal financial aid may use their scholarships, grants, and loans 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 the Financial Aid Office and the EAP counselor.

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 University of California and the United States. Students are responsible to the study center director, to the director of EAP, and to the faculty of the University of California 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 University of California 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 2003-2004 will be available beginning September 2002. Students are encouraged to consult counselors in the International Services Center early since filing dates are one year prior to participation. The center is located in Watkins House, next to Bannockburn, or call (909) 787-4113. Program details are available at internationalcenter.ucr.edu.

ELECTRICAL ENGINEERING

Subject abbreviation: EE

Jie Chen, Ph.D., Chair
Department Office, A220 Bourns Hall
(909) 787-2423; ee.ucr.edu

Professors
Gerardo Beni, Ph.D.
Bir Bhanu, Ph.D.
Jie Chen, Ph.D.
Ilya Dumer, Ph.D.
Jay A. Farrell, Ph.D.
Susan Hackbarth, Ph.D.
Yingbo Hua, Ph.D.

Associate Professors
Alexander Balandin, Ph.D.
Matthew J. Barth, Ph.D.
Roger Lake, Ph.D.
Ping Liang, Ph.D.

Assistant Professors
Alexander Korodkov, Ph.D.
Mihrir Ozkan (Electrical Engineering/Chemical and Environmental Engineering)
Zhengyan Xu, Ph.D.

Adjunct Professor
Hossny El-Sherief, Ph.D.

Cooperating Faculty
Laxmi Bhuyl, Ph.D.
(Computer Science and Engineering)
John dePillis, Ph.D. (Mathematics)
Michalis Faloutsos, Ph.D.
(Computer Science and Engineering)
Qing Jiang, Ph.D. (Mechanical Engineering)
Tao Jiang, Ph.D.
(Computer Science and Engineering)
Srikant Krishnamurthy, Ph.D.
(Computer Science and Engineering)
Keh-Shin Lii, Ph.D. (Statistics)
Mart Molle, Ph.D.
(Computer Science and Engineering)
Wald Najar, Ph.D.
(Computer Science and Engineering)
Cengiz Ozkan, Ph.D. (Mechanical Engineering)
S. James Press, Ph.D. (Statistics)
Chinya Ravishankar, Ph.D.
(Computer Science and Engineering)
Harry W. Tom, Ph.D. (Physics)
Satish Tripathi, Ph.D.
(Computer Science and Engineering)
Frank Vahid, Ph.D.
(Computer Science and Engineering)

Affiliated Emeritus
J. Keith Oddson, Ph.D. (Mathematics)

MAJOR

The Department of Electrical Engineering offers B.S., M.S., and Ph.D. degrees in Electrical Engineering. The B.S. degree provides strong training in those fundamental areas of mathematics, science, and electrical engineering that are required to support specialized professional training at the advanced level. Students are also provided with a well-rounded and balanced education through studies in humanities and social sciences. The major provides relevant laboratory experience and integrates the use of computers throughout the undergraduate curriculum. It is designed to provide in-depth professional training in a range of state-of-the-art specialty areas in electrical engineering and allow students the freedom to individually mold their program of professional specialty studies by choosing from a number of technical electives. The department maintains close student-faculty interactions, and maintains a schedule of courses allowing timely completion of degrees. This enables it to provide the high-quality undergraduate education necessary for a student to progress to the M.S. and Ph.D. degree level and/or succeed in an industrial career. The Electrical Engineering program 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

The Interssegmental 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. See engr.ucr.edu/studentaffairs/registration.htm for details.

Degree Requirements
University Requirements
See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements
See Degree Requirements. The Marlan and Rosemary Bourns College of Engineering, in the Undergraduate Studies Section, for requirements that students must satisfy.

The Electrical Engineering major uses the following major requirements to satisfy the college’s Natural Sciences and Mathematics breadth requirement.

1. One course in the biological sciences chosen from an approved list
2. CHEM 001A
3. MATH 009A
4. PHYS 040A, PHYS 040B

Major Requirements
1. Lower-division requirements (67 units)
   a) One course in the biological sciences chosen from an approved list
   b) CHEM 001A
   c) CS 010, CS 061
   d) EE 001A, EE 011A, EE 001B
   e) 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) EE 100A, EE 100B, EE 105, EE 110A, EE 110B, EE 115, EE 116, EE 132, EE 141, EE 175A, EE 175B
   b) CS 120A/EE 120A, CS 120B/EE 120B
   c) Twenty (20) units of technical electives (chosen with the approval of a faculty advisor) from CS 122B, CS 130, CS 161, CS 168; EE 102, EE 117, EE 128, EE 133, EE 140, EE 144, EE 146, EE 150, EE 151, EE 152, CS 143/EE 143
   d) STAT 155 or STAT 161

**Sample Program**

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<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tr>
<td>MATH 009A, MATH 009B</td>
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<td>MATH 009C</td>
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<tr>
<td>Biological Science Elective</td>
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**Sophomore Year**

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<td>PHYS 040C</td>
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<td>EE 001A, EE 011A, EE 001B</td>
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<td>ME 010</td>
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<td>Humanities/Social Sciences</td>
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<td>Biological Science Elective</td>
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**Junior Year**

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<td>EE 100A, EE 100B, EE 105, EE 110A, EE 110B, EE 116, EE 132</td>
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**Senior Year**

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<td>Technical Electives</td>
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<td>STAT 155 or STAT 161</td>
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<tr>
<td><strong>Total Units</strong></td>
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<td>12</td>
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**GRADUATE PROGRAM**

The Bourns College of Engineering offers programs leading to M.S. and Ph.D. degrees in Electrical Engineering.

Research focus areas currently include communications, computer vision, control, detection and estimation, distributed systems, electronic materials, error-correcting codes, information theory, intelligent sensors, intelligent systems, machine learning, modeling and simulation, multimedia, nanotechnologies and nanodevices, navigation, neural networks, pattern recognition, robotics and automation, signal processing, solid-state devices and circuits, system identification, and transportation systems.

All applicants for graduate status 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 are required to complete the Test of English as a Foreign Language (TOEFL) with a minimum score of 550. To meet the degree requirements of the Electrical Engineering program, all admitted students whose native language is not English are required to take ESL classes until they get a “clear pass” on the SPEAK test conducted at UCR by the Learning Center.

**Master’s Degree**

University requirements for the M.S. and Ph.D. degrees in Electrical Engineering are given in the Graduate Studies section of this catalog. 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, 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 to the graduate program in Electrical Engineering. Applicants lacking minimum undergraduate preparation in the above areas may be admitted but are required to 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**

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)**

Thirty-six quarter units of graduate or upper-division undergraduate work in Electrical Engineering and other approved subject areas are required to complete Plan I. At least 24 of these units must be in graduate-level courses taken at a campus of the University of California, 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.

**Thesis** An M.S. 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.

**Examination and Defense** 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 at least 18 quarter units of graduate-level courses taken at a University of California campus are required, 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).

**Comprehensive Examination** In addition to the course work, the students enrolled in Plan II are required to take the M.S. comprehensive examination. The examination is conducted jointly with the Ph.D. preliminary examination.

The comprehensive examination emphasizes the fundamental knowledge of the study area rather than the specifics covered in individual courses. Candidates must solve at least six 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, robotics, and manufacturing; intelligent systems; circuits and devices).

**Doctoral Degree**

An M.S. or equivalent degree in Electrical Engineering or a related field is normally required to be admitted to the Ph.D. program. Exceptional applicants may be admitted directly into the Ph.D. program without an M.S. degree. Students with backgrounds in other scientific fields are encouraged to apply to the graduate program in Electrical Engineering. Applicants lacking undergraduate preparation in the above areas may be admitted but are required to 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.

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 University of California with a GPA of 3.00 or better.

**Study Plan** 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.

**Course Work** 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 six 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, robotics, and manufacturing; intelligent systems; circuits and devices).

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 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.

**Dissertation** 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.

**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, (909) 787-2484, or visit ee.ucr.edu for information on graduate courses.

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**LOWER-DIVISION COURSES**

**EE 001A. Engineering Circuit Analysis I. (3)** Lecture, three hours. Prerequisite(s): MATH 046, PHYS 040C (both may be taken concurrently); concurrent enrollment in EE 01A. 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 01LA. Engineering Circuit Analysis I Laboratory. (1)** Laboratory, three 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 01B. Engineering Circuit Analysis II. (4)** Lecture, three hours; laboratory, three hours. Prerequisite(s): EE 001A and EE 011A. 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 02. Electrical and Electronic Circuits. (4)** Lecture, three hours; laboratory, three hours. Prerequisite(s): MATH 046, PHYS 040C. General 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.

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**UPPER-DIVISION COURSES**

**EE 100A. Electronic Circuits. (4)** Lecture, three hours; laboratory, three 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, three hours; laboratory, three 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 102. Analog Integrated Circuits. (4)** Lecture, three hours; laboratory, three hours. Prerequisite(s): EE 100B. Design, analysis, and application of analog integrated circuits. Topics include introduction to integrated circuit fabrication, IC active filters and switched-capacitor circuits, current-feedback, Norton and transconductance operational amplifiers, voltage comparators and regulators, video amplifiers, and phase-locked loops.


**EE 110A. Signals and Systems. (4)** Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 010; EE 001B (may be taken concurrently). MATH 046. Base 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, ear digital filtering, and sampling/aliasing.

**EE 110B. Signals and Systems. (4)** Lecture, three hours; laboratory, three 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 115. Introduction to Communication Systems. (4)** Lecture, three hours; laboratory, three hours. Prerequisite(s): EE 001B and EE 110B. 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 in techniques of modulation and demodulation.

**EE 116. Engineering Electromagnetics. (4)** Lecture, three hours; discussion, one hour. Prerequisite(s):
EE 117. Electromagnetics II. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): EE 116. Applications of Maxwell’s equations. Skin effect, bound- ary-value problems, plane waves in lossy media, transverse EM waves, hollow metal waveguides, cavity resonators, microstrip, 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 118. Introduction to Electromagnetic Devices. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): EE 116. An introduction to electromagnetic devices for students interested in mechatronics, robotics, control, computer peripherals, and energy or power systems areas. Emphasizes rotational devices commonly used in low-power automation systems. Analyzes permanent magnet DC motors, two-phase induction, brushless DC, and stepper motors.

EE 120A. Logic Design. (5) Lecture, three hours; laboratory, six hours. Prerequisite(s): CS 061. Design of digital systems. Topics include Boolean algebra; combinational and sequential logic design; design and use of arithmetic logic units, carry-lookahead adders, multipliers, decoders, comparators, multiplexers, flip-flops, registers, and simple memories; state-machine design; and basic register-transfer level design. Laboratories involve use of hardware description languages, synthesis tools, programmable logic, and significant hardware prototyping. Cross-listed with CS 120A.

EE 120B. Introduction to Embedded Systems. (5) Lecture, three hours; laboratory, eight 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 custom and programmable processor design, standard peripherals, memories, interfacing, and hardware/software tradeoffs. Laboratory involves use of synthesis tools, programmable logic, and microcontrollers and development of working embedded systems. Cross-listed with CS 120B.

EE 128. Data Acquisition, Instrumentation, and Process Automation. (4) Lecture, three hours; laboratory, three 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, three hours; laboratory, three 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, three hours; discussion, one 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 204. Advanced Electromagnetics. (4) Lecture, three hours; laboratory, three 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, three hours; outside research, three hours. Prerequisite(s): EE 203, 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, three hours; laboratory, three hours. Prerequisite(s): EE 201, EE 202, EE 203; 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.

EE 207. Noise in Electronic Devices. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): EE 203 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, three hours; discussion, one hour. Prerequisite(s): EE 202. Topics include semiconductor electronic band structure theory and methods, phonon dispersion theory and methods, defects in semiconductors, and electrical characterization of semiconductors.

EE 209. Semiconductors and Electronic Devices. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): EE 201, EE 203, EE 208. Covers the Boltzmann transport equation 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.

EE 210. Advanced Digital Signal Processing. (4) Lecture, three hours; discussion, one 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, nonparametric 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, three hours; discussion, one hour. Prerequisite(s): EE 210, EE 215, EE 236. 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, three hours; discussion, one hour. Prerequisite(s): EE 208. Covers the theory and methods used to model quantum electron transport in ultracold traditional semiconductor devices such as transistors, nanoscale research semiconductor devices such as quantum dots, and novel electronic material systems such as carbon nanotubes and molecular wires.

EE 215. Stochastic Processes. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): EE 210, EE 235. 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 optimum filter, matched filter, and Karhunen-Loève expansion; mean square estimation theory including smoothing, filtering, and linear prediction; Levinson's algorithm, lattice filters, and Kalman filters; and the Markov process.

EE 224. Digital Communication Theory and Systems. (4) Lecture, three hours; discussion, one 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. Topics include sampling and bandwidth; pulse code modulation; linear 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, three hours; discussion, one hour. Prerequisite(s): EE 215, EE 224. 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, three hours; discussion, one 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 235. Linear System Theory. (4) Lecture, three hours; discussion, one 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 realizations; and state feedback, pole placement, observer design, and compensator design.

EE 236. State and Parameter Estimation Theory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): EE 235 or equivalent. Covers autoregressive 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, on-line estimation, colored noise, and nonlinear filtering algorithms.

EE 237. Nonlinear Systems and Control. (4) Lecture, three hours; discussion, one 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 gain theorem, averaging methods, and feedback linearization.

EE 238. Linear Multivariable Control. (4) Lecture, three hours; discussion, one 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.

EE 239. Optimal Control. (4) Lecture, three hours; discussion, one 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.

EE 240. Pattern Recognition. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): EE 152 or consent of instructor. Covers advanced topics in digital image processing. Topics include image sampling and quantization, image transforms, stochastic image models, image filtering and restoration, and image data compression.

EE 242. Intelligent Systems. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): EE 141 or consent of instructor. Covers basic pattern recognition techniques. Topics include hypothesis testing, parametric classifiers, parametric estimation, nonparametric density estimation, nonparametric classifiers, feature selection, discriminant analysis, and clustering.

EE 241. Advanced Digital Image Processing. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): EE 152 or consent of instructor. Covers advanced topics in digital image processing. 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 242. Advanced Computer Vision. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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 245. Advanced Robotics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): EE 144, EE 225. Topics include robotics, mechatronics, and automation systems; design and analysis; mechanics; sensing and programming; linear and non-linear control; rigid and flexible systems; redundant robots; perception-driven action; multiarm cooperation; distributed autonomous robotic systems; programming languages and tools; simulation techniques; and application to mechatronics, manufacturing, and biomorphic systems.

EE 250. Information Theory. (3) Seminar, three hours. Prerequisite(s): EE 215, EE 225. Provides an overview of general limitations imposed on communication systems. Topics include source coding, source models, information as a stochastic concept, coding for discrete sources, stochastic models for discrete channels, coding theorems for channels with noise, and coding techniques for block and convolutional codes. Satisfactory (S) or No Credit (NC) grading is not available.
**ENGR 091. Freshman Seminar. (1)** Seminar, one hour. Prerequisite(s): transfer standing in the College of Engineering or consent of instructor. Introduction to careers in engineering and computer science. Professional and academic opportunities; ethical responsibilities of engineers and computer scientists; current research directions; academic qualifications and skills required. Faculty and invited participants survey the various disciplines. Students keep a journal summarizing the weekly activities. A term paper is required. Enrollment is limited. Graded Satisfactory (S) or No Credit (NC).

**ENGR 092. First-Year Seminar in Engineering. (1)** Seminar, ten to fifteen 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. 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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>ENGR 100</td>
<td>Engineering Thermodynamics</td>
<td>4</td>
<td>Lecture; three hours; discussion; one hour. Prerequisite(s): CHEM 001C or CHEM 01HC, MATH 010A, PHYS 040B; or consent of instructor. An introduction to engineering thermodynamics. Topics include work and energy; the first and second laws of thermodynamics, reversible processes, the Carnot cycle, entropy change, heat engines and refrigerators, properties of pure substances, and relationships between thermodynamic properties. Credit is awarded for only one of CHE 100, ENGR 100, or ME 100A.</td>
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<tr>
<td>ENGR 115</td>
<td>Introductory Fluid Mechanics</td>
<td>4</td>
<td>Lecture; three hours; discussion; one hour. Prerequisite(s): MATH 010A, MATH 046, ME 010; or consent of instructor. Introduces the principles and applications of fluid mechanics. Topics include fluid statics, conservation of momentum and energy; dynamics of incompressible and compressible flow in conduits, flow past immersed bodies, transportation and metering fluids, and agitation and mixing. Credit is awarded for only one of CHE 115, ENGR 115, or ME 115A.</td>
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<tr>
<td>ENGR 116</td>
<td>Heat Transfer</td>
<td>4</td>
<td>Lecture; three hours; discussion; one hour. Prerequisite(s): ENGR 100, ENGR 115; or consent of instructor. The analysis of steady and transient heat conduction, forced and natural convection, and radiation heat transfer. Design of heat exchangers. Credit is awarded for only one of CHE 116, ENGR 116, or ME 116A.</td>
</tr>
<tr>
<td>ENGR 118</td>
<td>Engineering Modeling and Analysis</td>
<td>5</td>
<td>Lecture; four hours; discussion; one hour. Prerequisite(s): CHEM 001C or CHEM 01HC, CS 010; MATH 046, PHYS 040B; or consent of instructor. Formulation of mathematical models for engineering systems. Application of mass, momentum, and energy balances to derive governing differential equations. Solution of equations using spreadsheets and other software packages. Fitting linear and nonlinear models to experimental data.</td>
</tr>
<tr>
<td>ENGR 190</td>
<td>Special Studies</td>
<td>5</td>
<td>Individual study; three to fifteen 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 16 units.</td>
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**ENGLISH**

Subject abbreviations: BSWT and ENGL

<table>
<thead>
<tr>
<th>Authors</th>
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<tbody>
<tr>
<td>George E. Haggerty, Ph.D., Chair</td>
<td>RISE B. Axelrod, Ph.D., Director</td>
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<tr>
<td>Rise B. Axelrod, Ph.D., Chair</td>
<td>Basic Writing</td>
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<tr>
<td>John C. Briggs, Ph.D., Director</td>
<td>Traise Yamamoto, Ph.D., Graduate Advisor</td>
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<tr>
<td>Traise Yamamoto, Ph.D., Graduate Advisor</td>
<td>Kimberly J. Devlin, Ph.D., Director; Undergraduate Studies</td>
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<tr>
<td>Kimberly J. Devlin, Ph.D., Director; Undergraduate Studies</td>
<td>Department Office, 1201 Humanities and Social Sciences; (909) 787-5301</td>
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<tr>
<td>Department Office, 1201 Humanities and Social Sciences; (909) 787-5301</td>
<td>Writing Resource Center, 1102 Humanities and Social Sciences; (909) 787-4745, x1384</td>
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**Professors**

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<tr>
<td>Rise B. Axelrod, Ph.D.</td>
<td>Professors</td>
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<td>Steven G. Axelrod, Ph.D.</td>
<td>Professors Emeriti</td>
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<td>Kimberly J. Devlin, Ph.D.</td>
<td>Gregory W. Bredbeck, Ph.D.</td>
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<td>Emory B. Elliott, Ph.D.</td>
<td>Milton Miller, Ph.D.</td>
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<td>Robert N. Essick, Ph.D.</td>
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**Associate Professors**

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<tr>
<td>Gregory W. Bredbeck, Ph.D.</td>
<td>Associate Professors</td>
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<tr>
<td>John C. Briggs, Ph.D.</td>
<td>Gregory W. Bredbeck, Ph.D.</td>
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<tr>
<td>Joseph W. Childers, Ph.D.</td>
<td>Katherine A. Kinney, Ph.D.</td>
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<td>Ph.D.</td>
<td>Tiffany A. López, Ph.D.</td>
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<td>Ph.D.</td>
<td>Parama Roy, Ph.D.</td>
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<td>Ph.D.</td>
<td>Carole-Ann Tyler, Ph.D.</td>
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<td>Ph.D.</td>
<td>Deborah S. Willis, Ph.D.</td>
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<tr>
<td>Ph.D.</td>
<td>Traise Yamamoto, Ph.D.</td>
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**Assistant Professors**

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<tr>
<td>Jennifer Doyle, Ph.D.</td>
<td>Assistant Professors</td>
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<tr>
<td>Michelle Herrmann Raheja, Ph.D.</td>
<td>Jennifer Doyle, Ph.D.</td>
</tr>
<tr>
<td>Josh Kuen, Ph.D.</td>
<td>Michelle Herrmann Raheja, Ph.D.</td>
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<tr>
<td>Amy A. Ongiri, Ph.D.</td>
<td>Joshua Kuen, Ph.D.</td>
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<tr>
<td>Ph.D.</td>
<td>James Tobias, Ph.D.</td>
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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. Stud-
ents begin the program by taking a course that introduces them to the tools of literary analysis and to a selection of literary genres. They then go on to complete a series of requirements that encourage engagement with a broad range of English and American literary texts and cultural practices, choosing from among courses organized in a variety of ways. Courses may focus on periods such as Medieval, Renaissance, Eighteenth Century, Romantic, Victorian, American, African American, Asian American, Chicano/Latino, Modern, and Contemporary literature; genres such as the dream vision, the Gothic novel, or film noir; areas such as post-colonial literature, film and visual cultures, gender and sexuality, or cultural studies; authors such as Chaucer, Austen, Dickinson, Wilde; major works such as Hamlet, Ulysses or Beloved; critical theory; the history of the English language; and creative writing. Combining tradition with innovation, structure with flexibility, the program allows students considerable freedom within the major to select courses according to their own interests.

**Degree Requirements**

**University Requirements**

See the Undergraduate Studies section for requirements that all students must satisfy.

**College Requirements**

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

**Major Requirements**

The major requirements for the B.A. in English are as follows:

1. ENGL 102 (4 units). This course should normally be taken prior to or concurrently with the student's first upper-division English course.

2. Five courses (20 units), at least 8 units of which must be at the lower-division level.
   a) English Literature to 1620: ENGL 023A, ENGL 129A, ENGL 149, ENGL 151A, ENGL 151B, ENGL 151T, ENGL 152, or ENGL 153
   b) English Literature 1620-1800: ENGL 023B, ENGL 125A, ENGL 129B, ENGL 154, ENGL 161A, ENGL 161B, or ENGL 161T
   c) English Literature 1800-1900: ENGL 023C, ENGL 125B, ENGL 166A, ENGL 166B, ENGL 166T, ENGL 172A, ENGL 172B, ENGL 172T
   d) American Literature to 1900: ENGL 031, ENGL 126A, ENGL 127A, ENGL 130, ENGL 131, ENGL 132
   e) Literature after 1900: ENGL 032, ENGL 125C, ENGL 126B, ENGL 127B, ENGL 129C, ENGL 133, ENGL 134, ENGL 155, ENGL 176A, ENGL 176B, ENGL 176C, ENGL 176T

3. One 4-unit course on literature and ethnicity, literature and gender, or literature and sexuality chosen from ENGL 121 (E-Z), ENGL 122, ENGL 123A, ENGL 123B, ENGL 124A, ENGL 124B, ENGL 136, ENGL 136T, ENGL 138A, ENGL 138B, ENGL 138T, ENGL 139, ENGL 139T, ENGL 143 (E-Z)/FVC 143 (E-Z), ENGL 144 (E-Z)/FVC 144 (E-Z)

4. One 4-unit course on literature and related fields, including theory, or a literary theme or genre chosen from ENGL 100 (E-Z), ENGL 101, ENGL 140 (E-Z), ENGL 141 (E-Z), ENGL 142 (E-Z), ENGL 143/EVC 143E, ENGL 145 (E-Z)/FVC 145 (E-Z)

5. Six additional upper-division English courses (24 units). Only 4 units from ENGL 105 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 24 units, a copy of an approved petition will be placed in the student's file.

Total units in major: 56 units, at least 8 units and no more than 20 units of which must be at the lower-division level.

Students are encouraged to take at least one of the following courses as a college breadth requirement or as an elective: WRIT 017A, WRIT 017B, WRIT 017C; CLA 027A, CLA 027B, CLA 040; ETST 183, ETST 114, ETST 120, ETST 124, ETST 138, ETST 170/WRIT 170; 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, HIST 150, HIST 151, HIST 152.

Each student is assigned a faculty advisor for help in shaping a program and following it through to graduation. Students are expected to 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 student affairs assistant.

**Minor**

The English minor is designed to provide a varied experience of the best literature in English. At both levels, the student is free to choose areas of particular interest and yet is guaranteed something of an overview.

1. Lower-division requirements (12 units)
   a) One course to be chosen from among ENGL 023A-ENGL 023B-ENGL 023C, ENGL 031, ENGL 032

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 Undergraduate Studies section of this catalog for additional information on minors.

**Subject A Requirement**

For regulations governing the Subject A requirement, see Subject A under Requirements for the Bachelor's Degree in the Undergraduate Studies section of this catalog. Students who have fulfilled the Subject A requirement may enroll in ENGL 001A. Students who are held for the requirement must take the Diagnostic Essay Examination, the results of which indicate whether they should enroll in ENGL 001A, BSWT 003, or a qualifier course. For information about qualifier courses, which offer eligible students instruction designed to help them fulfill the Subject A requirement, students may contact the English Department.

**Teaching Credential Waivers**

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 waiver. Details and counseling on the Bridge to Teaching Program, a waiver program for the multiple subjects credential, are available in the Liberal Studies and Interdisciplinary Programs office, (909) 787-2743. Details and counseling on other waiver programs are available in the Department of English or the Graduate School of Education.

**Education Abroad Program**

The English Department encourages eligible students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California's EAP Web site at
GRADUATE PROGRAM

All domestic and international applicants for graduate status in the Department of English must supply GRE General Test scores (quantitative and verbal taken within the past five years) prior to their admission.

Master’s Degree

The M.A. program in English, Plan II (Comprehensive Examination), is designed to encourage a broad familiarity with several fields of historical, theoretical, and genre-centered research within the discipline of English studies. For students who intend to go on for the Ph.D., such familiarity enables them to select the fields that will be the focus of a more specialized doctoral project.

Foreign Language

Students must demonstrate a reading knowledge of a foreign language. Such knowledge should make possible the development of an international dimension to the understanding of historical, theoretical, and genre-centered research.

Course Work

Students must pass 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 32 units in other 200-series courses, excluding ENGL 280, ENGL 290, 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 degree. Each student’s specific program is individually structured in consultation with the graduate advisor.

Essays and Comprehensive Examination

In the sixth quarter of the program, the student submits a portfolio of three essays, one of which has been revised according to the terms of ENGL 296, and a 750-1000 word metacommentary explaining the aims and achievements of the essays. The student is then examined orally for one hour on the material in the portfolio. Following this examination, the graduate committee, after the evaluation of the entire student file, determines which of the master’s degree recipients may continue into the Ph.D. program.

Doctoral Degree

The aim of the doctoral program in English is to encourage advanced students to become informed teachers and scholar-critics capable of significant original literary scholarship.

Admission

Admission to the Ph.D. program is open to holders of the UCR M.A. who have been recommended to go on and to qualified candidates with a master’s degree, preferably in English, from other institutions.

Foreign Language

Students entering from other institutions should at the first opportunity demonstrate proficiency in one foreign language or prove equivalent course work. Before advancement to candidacy, all students must demonstrate a reading ability in a second foreign language. In lieu of a second foreign language, students may complete any one of three alternatives involving the first foreign language or a related field approved by the graduate committee. For details, consult the graduate advisor or the departmental Graduate Brochure.

Course Work

The student, in consultation with the graduate advisor, selects two of the seminar fields and a correlated area of study, or simply three fields; with these emphases in mind, the student maps a course of intensive study through at least 56 units of 200-series courses, excluding ENGL 280, ENGL 291, ENGL 292, and ENGL 299, leading toward a qualifying examination and a dissertation. Up to 4 units of ENGL 290 may be counted toward the 36 units.

Dissertation and Final Oral Examination

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. A final oral defense of the dissertation completes the degree requirements.

For a more detailed description of the requirements for the M.A. or the Ph.D., contact the administrative assistant, Graduate Studies, Department of English.

Normative Time to Degree including UCR M.A. Work

18 quarters

BASIC WRITING

BSWT 001. Basic Writing. (0) Lecture, three hours; discussion, one hour. An introductory course designed to develop writing proficiency by means of regular written assignments and intensive individual interaction between student and instructor. Covers the structure of the English language and the logical exposition of ideas. Students taking this course who are held for the Subject A requirement are eligible to take the Subject A Examination at the end of the quarter. Carries workload credit equivalent to 4 units but does not count towards graduation units. Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class.

BSWT 003. Basic Writing for Second-Language Students. (0) Lecture, three hours; workshop, two hours. Prerequisite(s): consent of the Director of Basic Writing; concurrent enrollment in BSWT 003D. An introductory course designed to develop writing proficiency by means of regular written assignments and intensive individual interaction between student and instructor. Basic Writing students who need instruction in English as a second language should take this course instead of BSWT 001. Carries workload credit equivalent to 5 units but does not count towards graduation units. Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class.

BSWT 001D. Basic Writing for Second-Language Students. (0) Discussion, one hour. Prerequisite(s): consent of the Director of Basic Writing; concurrent enrollment in BSWT 003. Provides preparation for the Subject A Examination given at the end of the quarter. Focuses on reading closely, hostile syntax, organizing essays, and asking and answering academic questions. Carries workload credit equivalent to 1 unit but does not count towards graduation units. Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class.

ENGLISH

ENGL 001A. Beginning Composition. (4) F,W,S Lecture, three hours; extra writing and rewriting, three hours. Prerequisite(s): fulfillment of the Subject A 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.

Note: ENGL 001B is not ordinarily offered in the winter quarter. Students with a compelling need, however, may petition the English Department to enroll in special sections of ENGL 001B in the fall and ENGL 001C in the winter.

ENGL 001B. Intermediate Composition. (4) Lecture, three hours; extra writing and rewriting, three hours. Prerequisite(s): ENGL 001A. 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, three hours; extra writing and rewriting, three hours. Prerequisite(s): ENGL 001B. 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, three hours; extra reading and rewriting, three hours. Prerequisite(s): ENGL 001 or equivalent; admission to the University Honors Program or consent of instructor. 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. Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class. Satisfactory (S) or No Credit (NC) grading is not available.

ENGL 01SC. Applied Intermediate Composition for Science and Engineering Majors. (4) Lecture, three hours; extra reading and rewriting, three hours. Prerequisite(s): ENGL 001B. A course for science
and engineering majors corresponding to ENGL 001C and ENGL 011C. Helps students build the writing skills most relevant to their future work in science or engineering fields. 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 011C, or ENGL 011S.

**ENGL 004A. English Writing. (4) F,W,S** Lecture; three hours; extra reading and writing; three hours. Prerequisite(s): fulfillment of the Subject A requirement or consent of the Director of Basic Writing. Subject A students permitted to take this course must enroll concurrently in ENGL 004D. Introduces students to academic discourse in the liberal arts. Especially valuable for freshmen who are bilingual students interested in ground rules of academic inquiry and exchange in English writing that might not be commonplace consideration in their first languages. Students taking this course who are held for the Subject A requirement are eligible to take the Subject A Examination at the end of the quarter. Students may take ENGL 004A or both ENGL 004A and ENGL 004B. Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class. The grade for students taking both ENGL 004A and ENGL 004B is deferred until completion of the sequence.

**ENGL 004D. English Writing. (0)** Discussion, one hour. Prerequisite(s): open only to students who are enrolled in ENGL 004A or ENGL 004B and who have not met the Subject A requirement. Required of Subject A students taking ENGL 005A. Prerequisites: ENGL 004A, ENGL 004B, and must attend the first day to avoid being dropped from the class. Credit is awarded for only one of ENGL 004A or ENGL 004B. Required of Subject A students taking ENGL 005. Provides preparation for the Subject A Examination given at the end of the quarter. Focuses on reading closely, honing syntax, organizing essays, and asking and answering academic questions. Carries workload credit equivalent to 1 unit but does not count towards graduation units. Students must be formally enrolled prior to the beginning of instruction and must attend the first day to avoid being dropped from the class. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 3 units of workload credit.

**ENGL 012 (E-Z). Introduction to Literature. (4)** Lecture, three hours; discussion, one hour. 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 non-English majors.

**ENGL 012A. Introduction to Poetry. (4)** Lecture, three hours; extra reading, three 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, three hours; discussion, one hour. 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, three hours; extra reading, three hours. An introductory study of plays selected from various periods, including the modern. Special attention is paid to themes, forms, and relationships of text to theatrical performance. Intended primarily for non-English majors.

**ENGL 014. Major American Writers. (4)** Lecture, three hours; discussion, one hour. 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 non-English majors.

**ENGL 015. Modern Literature. (4)** Lecture, three hours; extra reading, three hours. An introductory course designed primarily for non-English majors. Focuses on an important theme or technique in modern and contemporary literature.

**ENGL 017. Shakespeare. (4)** Lecture, three hours; consultation/discussion, one hour. 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, three hours; screening, three 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 021. Culture Clash: Studies in Latino Theatre and Film. (4)** Lecture, three hours; discussion, one 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 023A. English Literary Traditions: Through the Early Seventeenth Century. (4)** Lecture, three hours; extra reading, three hours. Readings in English literature with attention to historical and cultural contexts.

**ENGL 023B. English Literary Traditions: Early Seventeenth Century through the late Eighteenth Century. (4)** Lecture, three hours; extra reading, three hours. Readings in English literature with attention to historical and cultural contexts.

**ENGL 031. American Literary Traditions. (4)** Lecture, three hours; extra reading, three hours. Readings in American literature to 1900, with attention to historical and cultural contexts.

**ENGL 032. Twentieth-Century Literature. (4)** Lecture, three hours; extra reading, three hours. Readings in twentieth-century literature in English, with attention to historical and cultural contexts.

**ENGL 100 (E-Z). Scriptures, Myths, and Interpretation. (4)** Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. This course focuses on issues of scriptural and mythical analysis. Possible areas covered include: the impact of scripture and myth on literatures written in English; the textual development of the Hebrew Scripture and its analogues, including the development of the King James version; major authors’ uses of scripture and myth; the history of scriptural and mythological exegesis; the place of scripture and myth in current criticism and theory. Course is repeatable as topics change.

**ENGL 101. Critical Theory. (4)** Lecture, three hours; consultation, one hour. A study of major theoretical issues in representative critical and scholarly works.

**ENGL 102. Introduction to Critical Methods. (4)** Lecture, three hours; extra reading, three hours. Prerequisite(s): a major in English or consent of instructor. Close analysis of formal features of several genres and an introduction to theoretical and critical approaches.

**ENGL 103. Advanced Composition. (4)** Lecture, three hours; discussion/consultation, one 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 112. History of the English Language. (4)** Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. 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, three hours; extra reading, three 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, three hours; extra reading, three 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, three hours; extra reading, three 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 121 (E-Z). Postcolonial Literatures of Asia, Africa, and the Caribbean. (4)** Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other
of British fiction, with some attention to the criticism and theory of the novel.

ENGL 126A. The American Novel: Nineteenth Century. (4) Lecture, three hours; extra reading, three 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; three hours; extra reading, three hours. Prerequisite(s): ENGL 126A 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, three hours; extra reading, three 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, three hours; extra reading, three 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 127C. American Poetry, 1960 to the Present. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ENGL 127B 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 128. Literature and Sexualities. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A critical study of the role of gender in American literature, focusing on the uses of theories of sexuality in the study of literature.

ENGL 128A. American Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A critical study of American literature, focusing on the uses of theories of sexuality in the study of literature.

ENGL 128B. African American Literature since the Harlem Renaissance. (4) Lecture, three hours; extra reading, three 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 128C. African American Literature through the Harlem Renaissance. (4) Lecture, three hours; extra reading, three 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 129A. English and American Drama: Elizabethan and Jacobean Drama. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) 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, 1820-1830. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ENGL 031 or consent of instructor. Examination of the literature of the pre-colonial, colonial, and early national periods, the work of such writers as Emerson, Hawthorne, Poe, Melville, Stowe, Thoreau, Douglass, and Whitman.

ENGL 131. American Literature, 1830 to the Civil War. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ENGL 031 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, three hours; extra reading, three hours. Prerequisite(s): ENGL 031 or consent of instructor. New departures in the American literary con-
ENGL 139. Asian American Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. A study of the literature of American and Asian Americans and an analysis of the cultural 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, three hours, extra reading, three 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, three hours; consultation or discussion, one hour. Prerequisite(s): none. 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, three hours; consultation or discussion, one hour. Prerequisite(s): none. A critical survey of the study of literature in relation to other fields: literature and creativity, literature and iconography, literature and society, literature and science, literature and behavior, literature and translation.

ENGL 142 (E-Z). Cultural Studies. (4) Lecture, three hours; extra reading, three 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, three hours; screening, three 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. Weekly screenings and readings. E. Feminist Film Theory and Practice; E. Film and Gender; G. Screening the Lesbian. Cross-listed with FVC 143 (E-Z).

ENGL 144 (E-Z). Race, Ethnicity, and Visual Culture. (4) Lecture, three hours; screening, three 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 Post-Colonial World Contest; J. Film, Race, and Ideology: The Case of the Vietnam War; K. Decolonizing the Screen. Cross-listed with FVC 144 (E-Z).

ENGL 145 (E-Z). Special Topics in Film and Visual Culture. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of a theme or issue in film, media, television, and visual culture. Weekly screenings and readings. E. Mass Culture and Gourmet Culture; F. Television and American Culture; G. Film as an Art and Writing as Film; I. Liberal Hollywood; H. Social “Problems”; J. Horror Film. Cross-listed with FVC 145 (E-Z).

ENGL 147 (E-Z). Studies in a Major Work. (4) Lecture, three hours; consultation/discussion, one hour. Concentrated study of a single major work from the English or American literary tradition, affording an opportunity for thorough exploration of the work, exploration of historical and critical approaches, and relevant contemporary approaches.

ENGL 148 (E-Z). Studies in Major Authors. (4) Lecture, three hours; extra reading, three 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, three hours; outside reading, three hours. English literature of the Anglo-Saxon period: such works as Beowulf, “The Seafarers,” and “The Wife’s Complaint.”

ENGL 151A. Middle English Literature: 1066-1500. (4) Lecture, three hours; outside reading, three 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, three hours; outside reading, three hours. Covers the great works of the later fourteenth century—Gower’s Télèmean, and the poems of the Gawain poet.

ENGL 151T. Studies in Medieval Literature. (4) Lecture, three hours; consultation or discussion, one 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, three hours; extra reading, three hours. Studies in some of the major ideas and movements of the English Renais-
sance (1500-1600), such as Christian humanism, neo-Platonism, syncrétism, puritanism, rational theology, science, republicanism, centering on such figures as More, Eloy, Castiglione, Ascham, Sidney, Jonson, Bacon, Hobbes, and Milton.

ENGL 153. Studies in Early Renaissance Literature. (4) Lecture, three hours; outside reading, three 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, three hours; outside reading, three 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-Cen

tury English Literature: 1660-1730. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, three 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), the Aesthetic Movement, and Decadence.

ENGL 162. Eighteenth-Century British and American Literature: 1900 to Late 1920s. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Covers Tennyson, Browning, Carlyle, Mill, Conrad, and 1920s (F. Scott, Proust, Hemingway, etc.).

ENGL 163. Nineteenth-Century British and American Literature: 1920s to 1950. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or lower-division English course (other than composition) or consent of instructor. Covers modernism and interwar (Hemingway, Eliot, Pound, Joyce, etc.), the (other than composition) or consent of instructor. Study of representative literary works: fiction, novel, poetry, and drama.

ENGL 164. Twentieth-Century British and American Literature: 1920s to 1950. (4) Lecture, three hours; extra reading, three 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 165. Twentieth-Century British and American Literature: 1950 to Present. (4) Lecture, three hours; extra reading, three 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 166. Studies in Twentieth-Century British and American Literature. (4) Lecture, three hours; extra reading, three 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 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 200. Introduction to Graduate Study in English. (4) Lecture, three hours; outside research, three 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 canons formation, field organization, critical and theoretical assumptions behind the establishment of various fields, and the uses of theory.

ENGL 260. Seminar in Medieval Literature. (4) Seminar, three hours; outside research, three 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 sub- jectivity; or methodology, including textual study, histori- cism, or literary theory. Course is repeatable as content changes.

ENGL 262. Seminar in Renaissance Literature. (4) Seminar, three hours; outside research, three 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 issues important to the field. Course is repeatable as content changes.

ENGL 264. Seminar in Restoration and Eighteenth-Century Literature. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three 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 Twentieth-Century British Literature. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Research in late eighteenth- and early nineteenth-century literature and culture and its legacy in modern critical configurations of romanticism. May include topics such as Bloomsbury and the Politics of Art; Joyce and Empire; Modernism, Modernity, and Gay Identities; British Postmodernity and Virginia Woolf. Course is repeatable as content changes.

ENGL 270. Seminar in Twentieth-Century American Literature. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Studies in theoretical movements. May emphasize histori- cal or thematic relations among various theoretical texts. Course is repeatable as content changes.

ENGL 273. Seminar in Cultural Studies. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal, historical, and theoretical research in the history and theory of culture in its broadest sense: popular literature, the mass media, and the interplay between popular and elite or “high” and “low” cultural forms. Course is repeatable as content changes.

ENGL 274. Seminar in Feminist Discourses. (4) Seminar, three hours; outside research, three 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, three hours; screening, three hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of film, television, and other forms of visually-oriented textuality. Approaches may include cultural criti- cism; 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, three hours; outside research, three 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 subalter- nity; nationalism, gender, and sexuality; neocolonialism 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 Lesbian and Gay Studies. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines literary, theoretical, and cultural rep- resentations by or of lesbians, gay men, and other sexually marginalized groups. Topics may include the history of sexuality, identity politics, passing and mimicry, and lesbian and gay literature. Course is repeatable as content changes.

ENGL 278. Seminar in Minority Discourse. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Intensive study and research in cultural traditions former- ly 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 bod- ies; oral history and literature. Course is repeatable as content changes.

ENGL 279. Seminar in Rhetorical Studies. (4) Seminar, three hours; outside research, three 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 writ-
PROFESSIONAL COURSES

ENGL 301. Introduction to the Teaching of English. (1) Individual and group conferences, one 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 a maximum of 2 units.

ENGL 302. Teaching Practicum. (1-4) Seminar, one to four 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 302 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, one hour; practicum, one to two 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. (2) Individual and group conferences, two 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. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required. Offered in summer only.

ENGL 305. Practicum in Teaching Writing. (1-4) Seminar, eight 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. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required. Offered in summer only.

ENGL 306. Professional Research Preparations. (2) Individual and group conferences, two 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. Students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade. See instructor for grading basis; no petition is required. Offered in summer only.

Professors
Michael E. Adams, Ph.D. (Entomology/Cell Biology and Neuroscience)
Nancy E. Beckage, Ph.D. (Entomology/Cell Biology and Neuroscience)
Thomas S. Bellows, Jr., Ph.D.
Ring T. Cardc, Ph.D.

in Entomology
Brian A. Federici, Ph.D.
J. Daniel Hare, Ph.D.
Robert F. Luck, Ph.D.
Jocelyn G. Millar, Ph.D.
Thomas A. Miller, Ph.D.
Joseph G. Morse, Ph.D.
Mir S. Mulla, Ph.D.
Bradley A. Mullens, Ph.D.
Timothy D. Paine, Ph.D.
Thomas M. Perring, Ph.D.
John D. Pinto, Ph.D.
Alexander Raikhel, Ph.D.
Richard A. Redak, Ph.D.
Michael K. Rust, Ph.D.
S. Nelson Thompson, Ph.D.
John T. Trumble, Ph.D.

Professors Emeriti
Martin M. Barnes, Ph.D.
Leland R. Brown, Ph.D.
Glenn E. Carman, Ph.D.
Richard D. Goeden, Ph.D.
Fred Legner, Ph.D.
Ralph B. March, Ph.D.
James A. Murcatty, Ph.D.
Earl R. Oatman, Ph.D.
Louis A. Riehl, Ph.D.
Vernon M. Stern, Ph.D.

Associate Professors
Peter W. Atkinson, Ph.D.
John M. Heraty, Ph.D.
Richard Stouthamer, Ph.D.
P. Kirk Visscher, Ph.D.
Gregory P. Walker, Ph.D.
William E. Walton, Ph.D.

Lecturer
Daniel González, Ph.D.
Heather Costa, Ph.D. Ornamental Crops
Elizabeth Grafton-Cardwell, Ph.D.

Pest Management
Mark Hoddie, Ph.D. Biological Control
John H. Klotz, Ph.D. Urban Entomology
Robert Krieger, Ph.D. Toxicology
Nicholas Toscano, Ph.D. Pest Management

Degree 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.

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:

1. Lower-division requirements (47 units)
   a) BIOL 005A, BIOL 051A, BIOL 051B, BIOL 051C
   b) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 002LA, PHYS 002LB, PHYS 002LC
   c) MATH 009A, MATH 009B
   d) CHEM 001A, CHEM 001B, CHEM 001C

2. Upper-division requirements (62 units)
   a) ENTM 100/BIOL 110, ENTM 110, ENTM 111/BIOL 112/BPSC 112, ENTM 127/BIOLOGY 127, ENTM 175/BIOLOGY 175
   b) Eighteen (18) additional units of entomology electives, which may include up to 4 units of ENTM 190, ENTM 197, or ENTM 199H
   c) BCH 100
   d) BIOL 102
   e) BIOL 104/BPSC 104
   f) CHEM 112A, CHEM 112B, CHEM 112C

3. Statistics (2 or 5 units): STAT 020 or 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.

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.

Counseling and information on the program and course requirements is provided by the departmental Undergraduate Advisor, Dr. Thomas M. Perring, 225 Entomology.
The Department of Entomology also participates in the Biological Sciences major. See the Biological Sciences listing in this catalog for information about its Entomology track.

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:

1. ENTM 100/BIOL 100
2. Select from the following upper-division Entomology courses to complete unit requirement: 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 132, ENTM 133, ENTM 162/BIOL 162, ENTM 173/BIOL 173, ENTM 190, ENTM 197, or ENTM 199H
3. No more than 4 units of ENTM 190, ENTM 197, or ENTM 199H, either solely or in combination, may be applied toward the unit requirement.
4. Students may count no more than 8 units toward both their major and minor fields of study.

See Minors under the College of Natural and Agricultural Sciences in the Undergraduate

Studies 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
- Neurosciences
- Pathology
- Pesticide toxicology
- Systematics
- Urban entomology

Information on participating faculty and their research specializations may be found at insects.ucr.edu and in the brochure Graduate Studies in Entomology. The Supplementary Information Pamphlet provides detailed information for completing the graduate program. These publications may be obtained from the Biological Sciences Graduate Student Affairs Center, 1151 Batchelor Hall, (800) 735-0717. University requirements for the M.S. and Ph.D. degrees are given in the Graduate Studies section of this catalog.

Admission

Students must have a bachelor’s degree with a major in Entomology, a biological science, Chemistry, Biochemistry, or a suitable equivalent. Course work is required in inorganic and organic chemistry, including laboratories, and general physics.

Additional admission requirements for M.S. and Ph.D. students consist of the equivalent of 30 quarter units of life sciences other than entomology, including one course in general biology and genetics. A course in biochemistry may serve as an elective in the life sciences. Students specializing in insect biochemistry, insect physiology, molecular entomology, neuroscience, or toxicology may substitute courses in organic, physical, and biological chemistry; toxicology; and pharmacology for courses in life sciences except for the equivalent of a one-year introductory course in general biology.

The department requires GRE General Test scores (verbal, quantitative, and analytical) and scores from one of the advanced tests. This requirement applies only to U.S. citizens and to international applicants residing in the United States at the time of application. The department strongly recommends that international students residing outside of the United States at the time of application also submit GRE scores.

All applicants whose first language is not English are required to complete the Test of English as a Foreign Language (TOEFL). A minimum score of 550 is required on the paper-based exam. A minimum score for the computer-based exam is 213.

Opportunities for Interdisciplinary Graduate Study

Faculty from the Department of Entomology also participate in unique graduate specializations in Cell, Molecular, and Developmental Biology, Cell Biology and Neuroscience, Environmental Toxicology, Evolution and Ecology, and Genetics, which 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 Curricula and Courses section of this catalog or contact the Biological Sciences Graduate Student Affairs Center, at (800) 735-0717.

Normative Time to M.S. 6 quarters
Normative Time to Ph.D. 17 quarters

LOWER-DIVISION COURSES

ENTM 010. Natural History of Insects. (4) F, W, S
Lecture, three hours; demonstrations, one hour. A study of the fascinating world of insects and their impact on man; designed for non-entomology majors. Living and preserved insects and many other visual aids are used. Federici, Gonzalez, Luck, Morse, Mullens, Paine, Perring, Redak, Rust, Troumble

ENMT 020. Bees and Beekeeping. (4) F, Odd Years
Lecture, three hours; discussion, one 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, Lecture, three hours; laboratory, three hours. Prerequisite(s): BIOL 005B, BIOL 005C, or equivalent; 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 109. Field Entomology. (4) S, Laboratory, four hours; field, eight 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 112. Systematics. (4) F, Lecture, three hours; discussion, one 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, Kim

ENTM 114. Aquatic Insects. (4) S, Even Years
Lecture, three hours; laboratory, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C; or

Sample Program

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consent of instructor. Investigates aquatic insects as nutrient-ent catchers, 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. Mullen, Walton

ENTM 124. Agricultural Entomology. (4) F, Odd Years Laboratory, four hours; field, eight hours. Prerequisite(s): BIOL 100/ENTM 100 or equivalent 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. Medical and Veterinary Entomology. (3) W, Odd Years Lecture, three hours; prerequisites: BIOL 005A, BIOL 005B, BIOL 005C, or consent of instructor. Biology, ecology, and management of arthropods affecting human and animal health. Arthropods as direct pests and vectors of human and animal disease (e.g., malaria, plague). Disease epidemiology and prevention and control of pests and associated diseases are discussed. Mullin, Mullen

ENTM 126L. Laboratory in Medical and Veterinary Entomology. (2) W, Odd Years Laboratory, six hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, or consent of instructor. Concurrent or previous enrollment in ENTM 126 is recommended. Identification of arthropods affecting humans and animals. Practical epidemiological exercises, including age-grading, blood meal and pathogen identification in vectors, vector capacity assessment, bioassay procedures, and sampling. Field trip(s) to animal production and mosquito abatement and research facilities are scheduled. Mullin, Mullen

ENTM 127. Insect Ecology. (4) Lecture; three hours; discussion; one hour. Prerequisite(s): BIOL 005A, BIOL 051A, BIOL 051B, BIOL 051C, CHEM 010C or CHEM 011C, CHEM 112B, CHEM 112C, MATH 009B or MATH 09HB, PHYS 002C, PHYS 002C, BIOL 100 or BIOL 110A, one course in statistics, or consent of instructor. Principles of insect ecology. Topics, with examples emphasizing the Arthropoda, 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. Credit is not allowed for both BIOL 117 and BIOL 127/ENTM 127. Bellows, Walton

ENTM 128. Chemistry and Toxicology of Insecticides. (3) F, Even Years Lecture; three hours. Prerequisite(s): BIOL 005A, BIOL 100/ENTM 100; or consent of instructor. Chemical properties and reactions of insecticides and acaricides and their modes of action and biochemical behavior in animal and plant systems. Miller

ENTM 129. Introduction to Biological Control. (2) F Lecture; two 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, six hours. Prerequisite(s): ENTM 129 (it is strongly recommended that ENTM 129 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. Heraty

ENTM 132. Taxonomy of Immature Insects. (4) S, Alternate Years Lecture; two hours; laboratory; six hours. Prerequisite(s): BIOL 100/ENTM 100 or consent of instructor. Morphology and identification of the immature stages of insects. Pinto

ENTM 133. Urban Entomology. (4) S, Even Years Lecture; three hours; laboratory; three 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; four hours. Prerequisite(s): BIOL 100/ENTM 100; or BIOL 005A, BIOL 005B, and BIOL 005C, or consent of instructor. An analysis of the mechanisms that cause and control behavioral reactions of insects. Emphasis on 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. Cardo, Visscher

ENTM 173. Insect Physiology. (4) Lecture; three hours; laboratory; three 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. (1-5) F, W, S Prerequisite(s): consent of instructor. Includes studies in specialized fields in entomology such as insects affecting subtropical fruits, deciduous fruits and nuts, floricultural crops and turf, vegetable and field crops, forest and ornamental trees and shrubs, stored products, and house-holds. Course is repeatable.

ENTM 197. Research for Undergraduates. (1-4) F, W, S Prerequisite(s): consent of instructor. Directed original research and preparation of written report. Course is repeatable.

ENTM 199H. Senior Honors Research. (1-5) F, W, S 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.

ENTM 204. Advanced Insect Ecology. (3) F Lecture, three hours. Prerequisite(s): an upper-division course in population and community ecology or consent of instructor. Emphasis on learning through extensive laboratory work and seminar-style lectures. Topics include insect population dynamics and community interactions, behavioral interactions of insects with their environment, and genetics of geographic variation and adaptation of insect populations. Hare, Millar, Visscher

ENTM 205. Insect Morphology. (3) W Lecture, three hours. Prerequisite(s): BIOL 100/ENTM 100 or an equivalent upper-division general biology course or consent of instructor. Principles of insect morphology, with emphasis on functional systems and morphological characters of phylogenetic importance and adaptive significance to insects; comparative anatomy of extinct and living insect groups; insect phylogenetic relationships. Pinto

ENTM 205L. Insect Taxonomy Laboratory. (2) W Laboratory, six hours. Prerequisite(s): BIOL 100/ENTM 100 or an equivalent upper-division general entomology course, and concurrent enrollment in ENTM 205. Principles of insect biology, stressing the characteristics of the major taxa and identification to the level of family. Pinto

ENTM 206. Insect Physiology and Biochemistry. (3) S, Lecture, three hours. Prerequisite(s): upper-division courses in general entomology and general biochemistry or consent of instructor. Graduate-level introduction to the physiology and biochemistry of insect systems. Topics covered include basics of growth and development, reproduction, nutrition, metabolism, endocrine and neuroendocrine factors that regulate these
processes. Graduate students receive letter grades; under-graduate students receive Satisfactory (S) or No Credit (NC) grades. 

**ENTM 227. Insect Population Ecology.** (3) W, Odd Years Lecture, three 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, three hours; laboratory, three hours. Prerequisite(s): BIOL 127/ENTM 127 or consent of instructor. Recommended: 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. Bellows

**ENTM 231. Insect Pathology.** (4) S, Even Years Lecture, three hours; laboratory, three 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, pathophysiology, symptomatology, and the use of microbial agents in the control of insect pests. Federici

**ENTM 232. Molecular Biology of Insects.** (3) S, Odd Years Lecture, three hours. 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, three hours; discussion, one hour. Prerequisite(s): BIOL 127/ENTM 127 or ENTM 204 or 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. Letter grades are assigned to students who present a formal seminar; others receive Satisfactory (S) or No Credit (NC) grades. Miller

**ENTM 241. Insect-Plant Interactions.** (4) F, Odd Years Lecture, three hours; discussion, one 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, Troumbly

**ENTM 242. Development of Hypotheses and Research Design.** (3) Lecture, one hour; discussion, one hour; written work, three 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, Troumbly

**ENTM 250. Seminar in Entomology.** (1) F,WS Seminar, one hour. A series of lectures by visiting scien-tists, staff and advanced graduate students on research topics in entomology and allied fields. Graded Satisfactory (S) or No Credit (NC).

**ENTM 251. Seminar in Insect-Plant Interactions.** (2) W Seminar, two 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, and the course may be taken more than once for credit. Paine, Troumbly, Walker

**ENTM 252. Seminar in Insect Behavior.** (2) S Seminar, two 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, and the course may be taken more than one year for credit. Cardé, Millar, Visscher

**ENTM 253. Seminar in Insect Toxicology.** (1) F Seminar, one hour. Prerequisite(s): ENTM 128 or consent of instructor. Selected topics in insect toxicology. Letter grades will be assigned to students presenting formal seminars: others will be graded Satisfactory (S) or No Credit (NC). Gill

**ENTM 254. Seminar in Biological Control.** (2) F,W Seminar, two hours. Prerequisite(s): BIOL 127/ENTM 127 or ENTM 129, or consent of instructor. Concepts, questions and hypotheses. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Bellows

**ENTM 255. Seminar in Medical and Veterinary Entomology.** (2) F Seminar, two hours. Prerequisite(s): ENTM 128 or consent of instructor. Rigorous review and analysis of advanced topics in medical and veterinary entomology and related disciplines. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Mullin, Mullens, Walton

**ENTM 256. Seminar in Systematic Entomology.** (2) S Seminar, two hours. Prerequisite(s): BIOL 112, PSYC 112/ENTM 112 or consent of instructor. Selected topics in insect systematics. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Heraty, Pinto

**ENTM 258. Seminar in Insect Pest Management.** (2) W Seminar, two hours. Prerequisite(s): consent of instructor. Selected topics in insect pest management. Letter grades will be assigned to students presenting formal seminars; by consent of the instructor, others will be graded Satisfactory (S) or No Credit (NC). Perring, Redak

**ENTM 261. Colloquium in Recombinant DNA.** (1) F,WS Seminar, one hour. Prerequisite(s): graduate status or consent of instructor. Oral reports by visiting scholars, faculty and students on current research topics in recombinant DNA. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 289, BIOL 289, BMSC 289, CHEM 289, NSC 289, and PSYC 289. Hatton in charge

**ENTM 290. Directed Studies.** (1-4) F,WS 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,WS Prerequisite: 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; 4) Grading will be Satisfactory (S) or No Credit (NC).

**ENTM 297. Directed Research (1-6) F,WS 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,WS Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**ENTM 301. Teaching Entomology at the College Level.** (1) F,WS Seminar, one 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,WS Practicum/consultation, three to twelve hours. Prerequisite(s): graduate standing, or 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.
ENVIRONMENTAL ENGINEERING

See Chemical and Environmental Engineering

ENVIRONMENTAL SCIENCES

Subject abbreviation: ENSC

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Robert C. Graham, Ph.D.,
Vice Chair; Teaching Program
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Atmospheric Chemistry
Christopher Amrheim, Ph.D. (Environmental Sciences)
Soil Chemistry
Roger Atkinson, Ph.D. (Environmental Sciences)
Atmospheric Chemistry
Andrew C.-S. Chang, Ph.D. (Environmental Sciences)
Agricultural Engineering
David E. Crowley, Ph.D. (Environmental Sciences)
Soil Microbiology
Walter J. Farmer, Ph.D. (Environmental Sciences)
Soil Chemistry
William T. Frankenberger, Jr., Ph.D. (Environmental Sciences)
Soil Microbiology
Robert C. Graham, Ph.D. (Environmental Sciences)
Soil Mineralogy and Pedology
William A. Jury, Ph.D. (Environmental Sciences)
Soil Physics
Keith C. Knapp, Ph.D. (Environmental Sciences)
Natural Resource Economics
John Letey, Jr., Ph.D. (Environmental Sciences)
Soil Physics
Larry J. Lund, Ph.D. (Environmental Sciences)
Soil Morphology, Genesis, and Classification
David R. Parker, Ph.D. (Environmental Sciences)
Soil Biogeochemistry
Daniel Schlenk, Ph.D. (Environmental Sciences)
Aquatic Ecotoxicology
Henry J. Vaux, Jr., Ph.D. (Environmental Sciences)
Natural Resource Economics
Mary Lynn V. Yates, Ph.D. (Environmental Sciences)
Environmental Microbiology

Professors Emeriti
Glen H. Cannell, Ph.D. (Environmental Sciences)
Soil Physics
 Homer D. Chapman, Ph.D., LL.D. (Environmental Sciences)
Soils and Plant Nutrition
Kenneth W. Gardiner, Ph.D. (Environmental Sciences)
Soil Sciences/Management
Albert L. Page, Ph.D. (Environmental Sciences)
Soil Chemistry
Parker F. Pratt, Ph.D. (Environmental Sciences)
Soil Chemistry

Associate Professors
Michael A. Anderson, Ph.D. (Environmental Sciences)
Environmental Chemistry
David M. Crohn, Ph.D. (Environmental Sciences)
Biosystems Engineering
Laosheng Wu, Ph.D. (Environmental Sciences)
Soil Physics
Paul J. Ziemann, Ph.D. (Environmental Sciences)
Atmospheric Science

Assistant Professors
Kenneth A. Baerenklau, Ph.D. Resource and Environmental Economics (Environmental Sciences)
Linda Fernandez, Ph.D. (Environmental Sciences)
Resource and Environmental Economics
Brian Lanoli, Ph.D. (Environmental Sciences)
Environmental Microbiology
Thomas Meixner, Ph.D. (Environmental Sciences)
Hydrology
Kurt A. Schwabe, Ph.D. (Environmental Sciences)
Resource and Environmental Economics
Lisa Stein, Ph.D. (Environmental Sciences)
Environmental Microbiology

✦✦

Acting Assistant Professor
W. Bowman Cutter, M.S. (Environmental Sciences)

Adjunct Professors
Andrei Bitynerowicz, Ph.D. (Environmental Sciences)
Atmospheric/Forest Sciences
Donald L. Suarez, Ph.D. (Environmental Sciences)
Geochemistry
Martinus T. van Genuchten, Ph.D. (Environmental Sciences)
Soil Physics
Scott R. Yates, Ph.D. (Environmental Sciences)
Soil Physics

Adjunct Associate Professor
Sabine Goldberg, Ph.D. (Environmental Sciences)
Soil Chemistry

Lector
Peter H. Diage, M.E.A. Environmental Sciences

Cooperating Faculty
Mark R. Matsumoto, Ph.D. (Chemical and Environmental Engineering)
Harry W.K. Tom, Ph.D. (Physics)

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 four options: Natural Science, Social Science, Soil Science, or Environmental Toxicology.

The necessity of maintaining an acceptable level of environmental quality is placing increasing demands upon governments, businesses, and industries locally, nationally, and worldwide. To help meet those demands, the Environmental Sciences program is designed to provide training for students intending to engage in 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 options 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.

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 participating in the Environmental Internship Program 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
accredited 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 biochemical 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.

Soil Science Option
The B.S. in Soil Science option provides specialized training needed by students whose professional interests require a detailed understanding of the soil environment in such areas as agriculture, hazardous waste site cleanup, groundwater quality control, ecosystem restoration, and forest and range management. Qualified students completing this option are able to enter UCR's graduate program in Soil and Water Sciences without significant deficiencies in their undergraduate curriculum.

Degree 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, of this catalog for requirements that students must satisfy.

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 courses listed under the lower-division and upper-division requirements and choose one of the options.

Note
With proper justification and the approval of the advisor, for any of the four options, students may substitute ENSC 197 or ENSC 198-I for one of the upper-division elective courses listed.

1. Lower-division requirements (29 units)
   a) ENSC 001, ENSC 002
   b) CHEM 001A, CHEM 001B, CHEM 001C
   c) MATH 005
   d) POSC 010

2. Upper-division requirements (15 units)
   a) ENSC 100, ENSC 101, ENSC 102, ENSC 191
   b) ENSC 100L or SWSC 100L

Environmental Toxicology Option
(72–74 units)
1. BIOI 005A, BIOI 051A, BIOI 055B
2. CHEM 005 or BIOL 005C; CHEM 112A, CHEM 112B, CHEM 112C
3. ENTX 101, ENTX 154
4. MATH 009A, MATH 009B
5. PHYS 002A, PHYS 002B, PHYS 002C
6. PHYS 021A, PHYS 021B, PHYS 021C are recommended
7. ENSC 006/ECON 006 or ENSC 143A/ECON 143A (ECON 003 prerequisite)
8. BCH 100 or both BCH 110A and BCH 110B; BIOL 102 or BIOL 121A/MCBL 121A; BCH 110C or BIOL 107A
9. STAT 100A and STAT 100B or STAT 120A and STAT 120B
10. Elective Courses:
   a) At least one course from the following:
      ENSC 127, ENSC 131, ENSC 135/
      CHEM 135/ENTX 135, ENSC 136/
      CHEM 136/ENTX 136/SWSC 136,
      ENSC 140/SWSC 140, ENSC 141,
      ENSC 142, ENSC 144/ENVE 144,
      ENSC 155, ENSC 163, ENSC 176/
      SWSC 176, BPSC 134/ENSC 134/
      SWSC 134, ENSC 104/SWSC 104,
      GEO 107/SWSC 107, ENSC 138/
      GEO 138/SWSC 138, SWSC 111,
      SWSC 124, CBNS 150/ENTX 150

Natural Science Option
(83–88 units)
1. BIOL 005A, BIOL 051A, BIOL 055B
2. PHYS 002A, PHYS 002B, PHYS 002C
3. PHYS 021A, PHYS 021B, PHYS 021C are recommended
4. MATH 009A, MATH 009B
5. CHEM 112A, CHEM 112B
6. GEO 001 or GEO 002
7. ENSC 006/ECON 006 or ENSC 143A/ECON 143A (ECON 003 prerequisite), ENSC 172
8. STAT 100A and STAT 100B or STAT 120A and STAT 120B
9. Elective Courses:
   a) At least one course from the following:
      BIOL 005C, CHEM 005, CHEM 112C,
      MATH 009C
   b) A total of at least five courses from the following (at least three must be Environmental Sciences or Soil and Water Sciences)
      ENSC 127, ENSC 131, ENSC 135/
      CHEM 135/ENTX 135, ENSC 136/
      CHEM 136/ENTX 136/SWSC 136,
      ENSC 140/SWSC 140, ENSC 141,
      ENSC 142, ENSC 144/ENVE 144,
      ENSC 155, ENSC 163, ENSC 170,
      ENSC 174, ENSC 176/SWSC 176,
      BPSC 134/ENSC 134/SWSC 134,
      ENSC 104/SWSC 104, ENSC 107/
      SWSC 107, ENSC 138/GEO 138/
      SWSC 138, SWSC 111, SWSC 124,
      BIOL 117, BIOL 121A/MCBL 121A,
      BIOL 121B/MCBL 121B, BIOL 160,
      BIOL 163, BPSC 104/BIOL 104,
      CHEM 109, ENTX 101, GEO 157,
      GEO 160, GEO 162, GEO 167,
      GEO 168A, GEO 168B

Social Science Option
(83–88 units)
1. BIOL 002, BIOL 003
2. MATH 022
3. GEO 001 or GEO 002
4. ECON 005
5. ENSC 143A/ECON 143A, ENSC 143B/ECON 143B, ENSC 143C/ECON 143C, ENSC 170, ENSC 172, ENSC 174

6. SOC 110A (SOC 001 prerequisite) or ECON 111

7. STAT 100A and STAT 100B or STAT 120A and STAT 120B or SOC 110B and SOC 110C (SOC 110A prerequisite for SOC 110B)

8. Elective Courses:
   a) At least one course from the following:
      ENSC 102 or ENSC 102H
      ENSC 141, ENSC 142, ENSC 144/EVI 144, ENSC 155, ENSC 163, ENSC 176/ SWSC 176, ENSC 134/ENSC 134, ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 138/ SWSC 138, SWSC 111, SWSC 124
   b) A total of at least six courses from the following:
      Economics: ECON 102A, ECON 102B, ECON 146, ECON 148, ECON 156, ECON 160/BSAD 160
      Society and culture: ANTH 132, ANTH 134, ANTH 135, ANTH 186/ENST 186, PHIL 117, SOC 137, SOC 143/URST 143, SOC 182/HDMV 182/URST 182, SOC 184
      Regulation and law: POSC 101, POSC 166, POSC 181, POSC 182, POSC 183
      Management: BSAD 121/STAT 121, BSAD 122, GEO 157, GEO 167, MATH 120

Soil Science Option (83–89 units)
1. BIOL 005A, BIOL 051A, BIOL 005B
2. CHEM 112A, CHEM 112B
3. MATH 009A, MATH 009B
4. PHYS 002A, PHYS 002B, PHYS 002C
5. PHYS 021A, PHYS 021B, PHYS 021C are recommended
6. GEO 001 or GEO 002
7. ENSC 006/ECON 006 or ENSC 143A/ECON 143A (ECON 003 prerequisite)
8. STAT 100A and STAT 100B of STAT 120A and STAT 120B
9. Elective Courses:
   a) A total of at least four courses from the following:
b) At least one course from the following:
   CHEM 005, CHEM 112C, MATH 009C
c) A total of at least two courses from the following:
   ENSC 136/CHR 136/ENTX 136, SWSC 136, ENSC 140/SWSC 140, ENSC 141, ENSC 142, ENSC 155, ENSC 163, ENSC 176/SWSC 176, BPSC 104/BIOI 104, BPSC 143/BIOI 143, BPSC 146, BPSC 160, GEO 030, GEO 157, GEO 160, GEO 162

Minor
The Minor in Environmental Sciences consists of:
1. Lower-division requirements (20 units)
   a) ENSC 002 or ENSC 017; ENSC 006/ECON 006
   b) CHEM 001A, CHEM 001B, CHEM 001C
2. Upper-division requirements (21 units)
   a) ENSC 100, ENSC 100L, ENSC 101, ENSC 102
   b) Eight (8) units of additional upper-division courses in Environmental Sciences, no more than 4 units of which are in courses numbered 190-198

No more than 8 of the 21 upper-division units may be in courses required by the student’s major.

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:
1. Water science:
   ENSC 136/CHR 136/ENTX 136, ENSC 140/SWSC 140, ENSC 141, ENSC 142, ENSC 163
2. Environmental chemistry:

LOWER-DIVISION COURSES

ENSC 001. Introduction to Environmental Science: Natural Resources. (4) F Lecture, three hours; discussion, one hour. An introduction to environmental science, focusing on natural resource description, management, and conservation. Topics covered include ecosystem characteristics and function; material and energy cycles; 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. Lanoil

ENSC 001H. Honors Introduction to Environmental Science: Natural Resources. (4) F Lecture, three hours; discussion, one 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. Lanoil

ENSC 002. Introduction to Environmental Science: Environmental Quality. (4) W Lecture, three hours; discussion, one 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. Amrhein

ENSC 002H. Honors Introduction to Environmental Science: Environmental Quality. (4) W Lecture, three hours; discussion, one 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. Amrhein

ENSC 003. Contemporary Issues in the Environmental Sciences. (4) S Lecture, three hours; discussion, one 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. Stern

ENSC 003H. Honors Contemporary Issues in the Environmental Sciences. (4) S Lecture, three hours; discussion, one 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. Stern

ENSC 006. Introduction to Environmental Economics. (4) Lecture, three hours; discussion, one 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. Cross-listed with ECON 006. This
course does not satisfy the Natural Sciences breadth requirement for the College of Humanities, Arts, and Social Sciences.

**ENSC 017. Environmental Impacts of Urbanization.** (4) FW Lecture, two hours; discussion, two 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. Diagne

**ENSC 092. Exploring Environmental Sciences.** (1) Seminar, one 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.** (3) F, Even Years Lecture, three hours. Prerequisite(s): CHEM 001A, CHEM 001B; concurrent enrollment in SWSC 100L or ENSC 100L; GEO 001 is recommended.

**ENSC 100L. Land Resources Laboratory.** (2) F Lecture, one hour; laboratory, three hours. Prerequisite(s): CHEM 001A, CHEM 001B, CHEM 001C; and current enrollment in ENSC 100; GEO 001 is recommended. Properties of lands as related to natural landscapes and their use by man. Requirements of land for agricultural, urban, industrial, and recreational use. Applications of remote sensing to land resource evaluation. Frankenberger

**ENSC 101. Water Resources.** (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 006/ENSC 006 or consent of instructor. The hydrologic cycle, the geographical distribution of water, aquatic ecosystems, and the use of species and communities as indicators of water quality, the uses of water, the problems of allocating water and a critical analysis of the several devices through which water is allocated among competing demands. Letey

**ENSC 102. Introductory Atmospheric Science.** (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001A, CHEM 001B, CHEM 001C. The structure of the atmosphere and man's impact upon it. The causes and consequences of air pollution. Air quality standards. Stratospheric and tropospheric ozone. Introduction to the chemistry of air pollution and air pollution control strategies. Arey

**ENSC 104. Environmental Soil Chemistry.** (5) F Lecture, three hours; laboratory, six hours. Prerequisite(s): CHEM 005 or ENSC 100 or consent of instructor. A study of the chemistry of the solid, liquid, and gas phases in soils and soil-like materials. Topics include solid and solution equilibria, mineral solubility, clay mineralogy, ion adsorption, and the chemistry of organic contaminants and toxic trace elements in soils. Cross-listed with SWSC 104. Amrhein

**ENSC 107. Soil Physics.** (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 009A or MATH 009A, MATH 009B, MATH 009B, 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. Wu

**ENSC 127. Fate and Transport of Contaminants in Soil.** (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001A or CHEM 001A; CHEM 001B or CHEM 011B; CHEM 001C or CHEM 011C; ENSC 100; MATH 009B or MATH 091B. Topics include interactions of environmental abiotic and biotic transformation and transport of major organic and inorganic contaminants in soil. Cross-listed with SWSC 127. Gan, Wu

**ENSC 131. Biology of the Soil Environment.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, CHEM 112A, CHEM 112B, ENSC 100, SWSC 104 or consent of instructor. The inhabitants of soil and their interrelationships with environmental quality. Biogeochemical cycling in terrestrial ecosystems, including wetlands; anthropogenic compounds in soils and their fate, transformations, and food-chain transfer. Soil health and air quality.

**ENSC 134. Soil Conditions and Plant Growth.** (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 104/BPSC 104, ENSC 100; 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 indicators; fundamentals of plant mineral nutrition; soil nutrient pools and cycles; soil acidity, alkalinity, salinity, and sodicity; root symbioses and rhizosphere processes. Cross-listed with SWSC 134 and BPSC 134 Parker

**ENSC 135. Chemistry of the Clean and Polluted Atmosphere.** (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 112A, CHEM 112B, or consent of instructor. Stratosphere of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric NOX 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; tropospheric ozone depletion and global warming. Cross-listed with CHEM 135 and ENTX 135. Akkinson

**ENSC 136. Chemistry of Natural Waters.** (4) S Lecture, three hours; discussion, one 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. Ziemann

**ENSC 138. Soil Morphology and Classification.** (4) S Lecture, three hours; laboratory, normally three hours; two one-day field trips. Prerequisite(s): ENSC 100, GEO 001 or GEO 002; or consent of instructor. The study of soils as they occur in the field and their relations to current and past environmental conditions. Use of field and laboratory data to understand soil genesis, causes of soil variability, fundamentals of soil classification, and land use potentials. Laboratory emphasizes the description and interpretation of soils and landscapes in the field. Cross-listed with GEO 138 and SWSC 138. Graham

**ENSC 140. Limnology.** (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001A or CHEM 011A; CHEM 001B or CHEM 011B; CHEM 001C or CHEM 011C; ENTX 101. Study of surface waters. Considerers 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. Aquatic Microbiology.** (4) F Lecture, three hours; discussion, one hour. Prerequisite(s): either BIOL 002 or both BIOL 011A and BIOL 011B; BIOL 005 or BIOL 005B; CHEM 001A or CHEM 011A; CHEM 001B or CHEM 011B; CHEM 001C or CHEM 011C; ENSC 101. Topics include microorganisms in natural and human-impacted waters; their distribution, enumeration, and activity; human pathogens in surface and ground water; transmission of disease via contaminated water; and regulations pertaining to microorganisms in water. Yates

**ENSC 142. Water Quality.** (4) F Lecture, four hours. Prerequisite(s): CHEM 001A or CHEM 011A; CHEM 001B or CHEM 011B; CHEM 001C or CHEM 011C; CHEM 001D or CHEM 011D or CHEM 001DB or CHEM 011DB; 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. Chang

**ENSC 142L. Water Quality Laboratory.** (1) F Laboratory, three hours. Prerequisite(s): ENSC 142, (may be taken concurrently). Laboratory exercises in water quality evaluation and water purification processes. Chang

**ENSC 143A. Environmental Economics.** (4) F Lecture, three hours; discussion, one hour. Prerequisite(s): ECON 003, 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.

**ENSC 143B. Natural Resource Economics.** (4) W Lecture, three hours, discussion, one 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.

**ENSC 143C. Ecological Economics and Environmental Valuation.** (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): either BIOL 002 or both BIOL 005A and BIOL 005B; CHEM 001C or CHEM 011C; either both ENSC 001 (or ENSC 011B) and ENSC 002 (or ENSC 011D) or ENSC 101; MATH 009B (or MATH 091B) or MATH 092; 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 maintaining public and environmental well-being. Cross-listed with ENSC 143.

**ENSC 155. Principles and Applications of Bio-remediation.** (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, CHEM 112A, CHEM 112B, ENSC 100. Prerequisites, applications, and case histories of biological treatment in the cleanup of hazardous chemicals including remediation of contaminated soils, sediments, sludges, groundwater, and vapors. Frankenberger

**ENSC 163. Hydrology.** (4) W Lecture, three hours; laboratory, three hours. Prerequisite(s): either the MATH 009A and MATH 009B sequence or the MATH 091B and MATH 092B sequence. STAT 040B or STAT 040C; 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. **Meixner**

**ENSC 170. Workshop in Environmental Management.** (4) S Workshop, five hours. Prerequisite(s): upper-division standing or consent of instructor. Training exercise in which students make decisions and interact to influence the simulated physical, political, social, and economic environments of a typical American metropolitan area. **Diage**

**ENSC 172. Principles of Environmental Impact Analysis.** (4) F,W,S Lecture, three hours; discussion, one 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. **Diage**

**ENSC 174. Law, Institutions, and the Environment.** (4) W Lecture, three hours; discussion, one 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 public interest in the use and protection of natural resources. **Kindschy**

**ENSC 176. Acquisition and Analysis of Environmental Data.** (5) Summer Lecture, two hours; discussion, one hour; laboratory, three hours; field, three hours. Prerequisite(s): ENSC 100, ENSC 101, ENSC 102, either the STAT 100A and STAT 100B sequence or STAT 120A and STAT 120B sequence; or consent of instructor. Explores general principles of environmental sampling. Field exercises cover sampling and analysis of air, water, and soil; hydrologic and limnological measurements; and biological characterization of water and surface waters. Topics also include principles and use of geographic positioning systems (GPS); basic surveying and cartographic techniques for site characterization; and interpretation and presentation of field and laboratory data using computer software. Cross-listed with SWSC 176. **Parker, Anderson, Bytnerevicz**

**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 on Satisfactory (S) or No Credit (NC) basis; however, students may petition the instructor for a letter grade. Course is repeatable. **Diage**

**ENSC 191. Seminar in Professional Development in Environmental Sciences.** (3) F,W,S Seminar, two 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. **Diage**

**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 on Satisfactory (S) or No Credit (NC) basis; however, students may petition the instructor for a letter grade. Course is repeatable. **Diage**

**ENSC 198-I. Internship in Environmental Sciences.** (1-12) F,W,S Field, three to thirty-six 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. **Diage**

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**ENVIRONMENTAL SCIENCES GRADUATE PROGRAM**

**Subject abbreviation: ENSC**

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**Graduate Program in Environmental Sciences**

**Program Office, 2207 Geology**

Keith C. Knapp, Ph.D., Graduate Advisor

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**Associate Professors**

Michael A. Anderson, Ph.D. (Environmental Sciences)

Wilfred Chen, Ph.D. (Chemical and Environmental Engineering)

David M. Crohn, Ph.D. (Environmental Sciences)

Marc Deshusses, Ph.D. (Chemical and Environmental Engineering)

Michael A. McKibben, Ph.D. (Earth Sciences)

Alan E. Williams, Ph.D. (Earth Sciences)

Laosheng Wu, Ph.D. (Environmental Sciences)

Jingsong Zhang, Ph.D. (Chemistry)

Paul J. Zeimann, Ph.D. (Environmental Sciences)

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**Assistant Professors**

Juliann E. Allison, Ph.D. (Political Science)

Kenneth A. Baerenklaus, Ph.D. (Environmental Sciences)

Marla L. Cruz-Torres, Ph.D. (Anthropology)

Linda Fernandez, Ph.D. (Environmental Sciences)

Jiaying “Jay” Gan, Ph.D. (Environmental Sciences)

Erik Hoek, Ph.D. (Chemical and Environmental Engineering)

Brian D. Lanoil, Ph.D. (Environmental Sciences)

Thomas Meixner, Ph.D. (Environmental Sciences)

Kurt Schwabe, Ph.D. (Environmental Sciences)

Lisa Stein, Ph.D. (Environmental Sciences)

Anders O. Wistrom, Ph.D. (Chemical and Environmental Engineering)

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**Adjunct Professor**

James Lents, Ph.D. (Engineering)

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Recent years have seen a dramatic increase at both the state and national level in the need for individuals trained to handle complex environmental problems. Numerous environmental concerns associated with pesticide application, waste disposal, air pollution, and other health-threatening activities have prompted regulatory agencies to develop strategies for the use and disposal of potentially hazardous materials. This situation has created a need in government and industry for scientists trained in a broad spectrum of disciplines. Well-trained environmental scientists are in demand at all levels of the regulatory process.

The Interdepartmental Graduate Program in Environmental Sciences mobilizes the expertise of UCR’s faculty by providing advanced educational opportunities for students interested in pursuing research, teaching, and professional careers in the wide spectrum of activities relevant to environmental science.

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**GRADUATE PROGRAM**

Students normally come to the program having completed an undergraduate degree in environmental science, in a related discipline such as atmospheric science, aquatic science, earth science, economics, hydrology, soil science, or one of the basic sciences such as biology, chemistry, physics. Students are expected to have completed the following courses or their equivalents before entering the program, or to make up the deficiency early in their graduate studies.

**CHEM 001A, CHEM 001B, CHEM 001C or equivalent**
Students may conduct research in any environmentally related area of interest to a sponsoring faculty member. Examples are:

- Kinetic and products studies of the atmospheric chemistry of volatile organic compounds
- Laboratory studies of the dynamics, kinetics and products of the photolysis and reactions of small molecules in the gas phase
- Emissions of organic compounds from biogenic sources
- Atmospheric chemistry and genotoxicity of polycyclic aromatic hydrocarbons and their nitrated derivatives
- Atmospheric deposition of nitrogenous compounds and their effect on plant community structure and function in California ecosystems
- Fate and consequences of contaminants discharged into natural and constructed wetlands
- Integrated assessment of the food-chain hazards posed by trace metals released into the environment
- Ecotoxicology of contaminants in inland saline lakes in California (Salton Sea, Owens Lake bed)
- Geophysical monitoring of contaminant migration
- Shallow noninvasive detection of wastes and waste containers
- Field scale transport and fate of chemicals in the vadose zone
- Volatilization of organic chemicals from soil and water surfaces
- Transport and fate of pathogenic organisms in soils and aquifers
- Bioremediation of toxic substances in soils
- Theoretical and experimental studies of colloidal aggregation
- Economic issues associated with agriculture, natural resources, and the environment
- Economic impacts of air quality and climate on agriculture
- Management and policy issues associated with California water resources

There is no foreign language requirement for the program.

Master's Degree

The Department of Environmental Sciences offers the M.S. degree under the Plan I (Thesis) and Plan II (Comprehensive Examination) options.

Course Work

1. Transport and Fate of Chemicals

   CHEM 246/ENSC 200/ENTX 200 (Fate and Transport of Chemicals in the Environment)
   ENSC 202 (Principles and Application of Environmental Modeling)

2. Interactions and Cycling in the Biosphere

   ENSC 208/ENTX 208/SWSC 208 (Ecotoxicology)
   ENSC 232/SWSC 232 (Biogeochemistry)

3. Environmental Policy and Management

   ENSC 201 (Environmental Management)
   ENSC 206/POSC 206 (Environmental Law and Policy)

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. At least 24 of the 36 units must be graduate courses. Students must take one course each from (1) and (2) above and two courses from 3. A maximum of 12 of the 24 graduate units may be in graduate research for the thesis. Each quarter, students must enroll in the seminar course CHEM 257/SWSC 257 and give an oral presentation at the annual student seminar or retreat. No more than two units of CHEM 257/SWSC 257 may be applied toward the 24-unit graduate requirement. Students must write a thesis that is accepted by the thesis committee members and pass an oral defense of the thesis.

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. At least 18 of the 36 units must be graduate courses. Students must take at least four graduate courses from the three core areas listed above, including one course each from (1) and (2) above and two courses from 3. Students may count no more than 2 units of CHEM 257/SWSC 257 toward the required 18 units and no units from graduate research for thesis or dissertation. Students 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 program chair. 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.

DOCTORAL DEGREE

Course Work Upon acceptance to the program, the student selects a course work advisory committee consisting of three members of the faculty participating in the graduate program to assist in the planning of the individualized curriculum. A course work study plan should be filed with the graduate advisor by the second quarter after admission. Students must take one course each from (1) and (2) below and two courses from 3.

1. Transport and Fate of Chemicals

   CHEM 246/ENSC 200/ENTX 200 (Fate and Transport of Chemicals in the Environment)
   ENSC 202 (Principles and Application of Environmental Modeling)

2. Interactions and Cycling in the Biosphere

   ENSC 208/ENTX 208/SWSC 208 (Ecotoxicology)
   ENSC 232/SWSC 232 (Biogeochemistry)

3. Environmental Policy and Management

   ENSC 201 (Environmental Management)
   ENSC 206/POSC 206 (Environmental Law and Policy)

Each quarter, students must enroll in the seminar course CHEM 257/SWSC 257 and give an oral presentation at the annual student seminar or retreat. The elective courses prescribed by the student's course work advisory committee depends on the research interests of the student.

Comprehensive Written Examination Following completion of all course work, the student writes a qualifying examination prepared and administered by the written qualifying committee, which consists of five faculty members with interests in the students' line of research. The written exam may be attempted only twice. If it is failed twice, the student is redirected to the master's degree or terminated from the program.

Oral Examination A student who has successfully passed the written qualifying examination may proceed with the oral qualifying examination, conducted before the oral qualifying examination committee, which consists of five faculty members, one of whom must be from outside the graduate program in Environmental Sciences. The oral examination may be attempted only twice. If the oral qualifying exam is failed twice, the student is redirected to the master's degree or terminated from the program. The written and oral exams are normally taken at the end of the second year of graduate study.

Dissertation All students write a doctoral dissertation, which is read and accepted by all members of the doctoral dissertation committee, comprised of three faculty from the graduate program in Environmental Sciences. The student must pass a final, oral defense of the thesis in front of the three members.

Relationship between Master's and Doctoral Programs The master's and Ph.D. programs are separate. Students who enter the Ph.D. program do not need to acquire a master's first, although students may elect to take both.

Normative Time to Degree 15 quarters

Career Opportunities

Students trained in the Interdepartmental Graduate Program in Environmental Sciences can fill many areas of expertise needed in the state and nation. Such areas include regulatory agencies, consulting firms, government and academic research institutions, and industrial research facilities.
ENSC 200. Fate and Transport of Chemicals in the Environment. (4) Lecture, four hours. Prerequisite(s): CHEM 109 or CHEM 110B, CHEM 112A, CHEM 112B, CHEM 112C; or consent of instructor. Covers the identification of toxicsants 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 water, air, 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, three hours; discussion, one hour. Prerequisite(s): ECON 003 or ECON 003H 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, three hours; discussion, one 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 on a Satisfactory (S) or No Credit (NC) basis by students advanced to candidacy for the Ph.D.

ENSC 206. Environmental Policy and Law. (4) S, Even Years Seminar, three hours; extra reading, three hours. Prerequisite(s): graduate standing; POSC 010 or POSC 010H; POSC 020; 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.

ENSC 208. Ecotoxicology. (4) W, Even Years Lecture, three hours; discussion, one 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.

ENSC 224. Watershed Hydrologic Systems. (5) S, Odd Years Lecture, three hours; discussion, two hours. Prerequisite(s): one of ENSC 163, GEO 157, MATH 09HC, or MATH 009C, or consent of instructor. Discusses the hydrologic processes occurring at watershed scale and the systems of and distributed approaches to watershed hydrologic modeling. Focuses on modeling rainfall-runoff processes and considering water quality to determine the validity of hydrologic simulation models. Cross-listed with SWSC 224.

ENSC 225. Watershed Biogeochemistry. (3) S, Even Years Lecture, three hours. Prerequisite(s): one of ENSC 163; CHEM 130/ENSC 130/ENTX 130/ENSC 136 or ENSC 104/SWSC 104 or ENSC 232/SWSC 232 is recommended. Emphasizes terrestrial-aquatic linkages in headwater catchments, focusing on hydrologic pathways, isotopic and geochemical tracers, nutrient cycling, water quality, experimental manipulations, and modeling. Cross-listed with SWSC 225.

ENSC 232. Biogeochemistry. (4) F, Odd Years Lecture, three hours; discussion, one 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 SWSC 232. Parker

ENSC 297. Directed Research. (1-6) Outside research, three to eighteen 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, three to thirty-six 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.

ENVIRONMENTAL TOXICOLOGY

Subject abbreviation: ENTX

Professors

Michael E. Adams, Ph.D. Neurosciences
(Entomology/Cell Biology and Neuroscience)
Janet T. Arey, Ph.D. Atmospheric Chemistry
(Environmental Sciences)
Roger Atkinson, Ph.D. Atmospheric Chemistry
(Environmental Sciences)
Nancy E. Beckage, Ph.D. Biotechnology and Endocrinology
(Entomology/Cell Biology and Neurosciences)
Craig V. Byus, Ph.D. Pharmacology
(Biomedical Sciences)
Andrew C. Chang, Ph.D. Agricultural Engineering
(Environmental Sciences)
Michael D. Coffey, Ph.D. Syngisthina
Taxonomy and Genetics (Plant Pathology)
Donald A. Cooksey, Ph.D. Bacterial Copper Resistance
(Plant Pathology)
Carl F. Cranor, Ph.D. Regulation of Toxic Substances (Philosophy)
David E. Crowley, Ph.D. Environmental Microbiology
(Environmental Sciences)
Michael F. Dunn, Ph.D. Enzymology/Physical Biochemistry
(Environmental Sciences)
David A. Eastmond, Ph.D. Toxicology
(Cell Biology and Neuroscience)
Walter J. Farmer, Ph.D. Soil Chemistry
(Environmental Sciences)

Dennis D. Focht, Ph.D. Soil Microbiology
(Plant Pathology)
Sarjeet S. Gill, Ph.D. Toxicology
(Cell Biology and Neuroscience)
Andrew J. Grosovsky, Ph.D. Molecular Carcinogenesis
(Cell Biology and Neuroscience)
William A. Jury, Ph.D. Soil Physics
(Environmental Sciences)
Ashok K. Mulchandani, Ph.D. Biosensors
(Chemical and Environmental Engineering)
Laurie Owen-Schaub, Ph.D. Molecular Carcinogenesis (Biomedical Sciences)
Daniel Schlenk, Ph.D. Aquatic Ecotoxicology
(Environmental Sciences)
James J. Sims, Ph.D. Chemistry of Natural Products (Plant Pathology)
Prudence Talbot, Ph.D. Cell Biology
(Cell Biology and Neuroscience)
Mary Lynn V. Yates, Ph.D. Environmental Microbiology (Environmental Sciences)

Associate Professors

Wilfred Chen, Ph.D. Chemical Engineering
(Chemical and Environmental Engineering)
Margaret C. Currás-Collazo, Ph.D. Neurosciences
(Cell Biology and Neuroscience)
Marc A. Deshusses, Ph.D. Environmental Biotechnology (Chemical and Environmental Engineering)
Manuela M. Martins-Green, Ph.D. Cell Signaling
(Cell Biology and Neuroscience)
David R. Parker, Ph.D. Biogeochemistry
(Environmental Sciences)
Frances M. Sladek, Ph.D. Transcriptional Regulation (Cell Biology and Neuroscience)
Paul J. Ziemann, Ph.D. Atmospheric Chemistry
(Environmental Sciences)

Assistant Professors

Jeffrey B. Bachant, Ph.D. Chromosome Segregation
(Chemical and Environmental Engineering)
Jianying “Jay” Gan, Ph.D. Water Quality (Environmental Sciences)
Xuan Liu, Ph.D. Transcription Regulation (Biochemistry)
Constance Nugent, Ph.D. Telomere Replication (Chemical and Environmental Sciences)
Lisa Stein, Ph.D. Environmental Microbiology
(Environmental Sciences)
YinSheng Wang, Ph.D. (Biological Mass Spectrometry) (Chemistry)
Yushan Yan, Ph.D. Environmental Engineering (Chemical and Environmental Engineering)

Adjunct Professor

Scott R. Yates, Ph.D. Soil Physics
(Environmental Sciences)

Lecturer

Robert Krieger, Ph.D. Pesticide Toxicology (Entomology)

GRADUATE PROGRAM

The interdepartmental graduate program in Environmental Toxicology has participating faculty from the departments of Biochemistry, Cell Biology and Neuroscience, Chemical and Environmental Engineering, Chemistry, Entomology, Environmental Sciences, Philosophy, and Plant Pathology, as well as scientists from...
the Air Pollution Research Center and the Division of Biomedical Sciences.

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 are expected to complete

1. A core of courses in environmental toxicology: ENSC 200/ENTX 200/CHM 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** For admission into the graduate program in Environmental Toxicology, a student must have a B.A. or B.S. degree from an accredited institution and an academic record which satisfies the minimum admission standards established by the Graduate Division, UCR. 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 051A, BIOL 005B
- BCH 100 or both BCH 110A and BCH 110B; BCH 110C or BIOL 107A
- CHEM 001A, CHEM 001B, CHEM 001C, 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 009A, MATH 009B
- PHYS 002A, PHYS 002B, PHYS 002C
- STAT 100A and STAT 100B or STAT 120A and STAT 120B

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 Environmental Toxicology 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 Environmental Toxicology graduate student establish a guidance committee which participates in the annual student progress evaluation procedure and advise 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** 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.

Thirty-six (36) units are required, of which 24 must be in graduate-level courses. 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) each quarter, 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** Students must meet general university requirements of the Graduate Division as found in the Graduate Studies section of this catalog. Beyond the required core sequence, all students must enroll in the Environmental Toxicology seminar (ENTX 270) 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 sub-organismal 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.

**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. The oral examination includes 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. A dissertation acceptable to all committee members must be submitted based upon inde-
pendent, original research. 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 are required to 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.

Normative Time to Degree 15 quarters

ENTX 101. Fundamental Toxicology. (4) W Lecture, three hours; discussion, one 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 toxics on various organ systems. Characterization and assessment of risks are also covered. Schlenk

ENTX 135. Chemistry of the Clean and Polluted Atmosphere. (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 112A, CHEM 112B, or consent of instructor; ENVC 102 recommended. Structure of the troposphere and stratosphere; formation of atmospheric ozone; tropospheric ox 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 155 and ENVC 135. Atkinson

ENTX 136. Chemistry of Natural Waters. (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 005 with a grade of "C" or better or ENVC 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 156, ENVC 136, and SWSC 136. Ziemann

ENTX 150. Cancer Biology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BCH 110C or BIOL 107A. CBSN 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 CBSN 150. Sladec

ENTX 154. Risk Assessment. (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): ENTX 101, and either STAT 100A or STAT 105 or STAT 120A, 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

ENTX 200. Fate and Transport of Chemicals in the Environment. (4) S Lecture, four hours. Prerequisite(s): CHEM 109 or CHEM 110B; CHEM 112A, CHEM 112B, CHEM 112C, or consent of instructor. Covers the identification of toxics and their source 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 ENVC 208. Frossosky

ENTX 200L. Analysis and Identification of Environmental Toxicants. (3) S, Even Years Lecture, one hour; laboratory, six hours. Prerequisite(s): CHEM 125 (lecture portion only), CHEM 246/ENVC 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 solid 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 infrared spectroscopy is emphasized. Arey

ENTX 201. Principles of Toxicology. (4) F, Lecture, three hours; seminar, one hour. Prerequisite(s): BCH 110A, BCH 110B; or consent of instructor. The structure-activity and dose-response relationships of environmental toxics; 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, six 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. Gradated Satisfactory (S) or No Credit (NC). Course is repeatable. Eastmond

ENTX 202. Mechanisms of Toxicity. (4) W Lecture, three hours; seminar, one hour. Prerequisite(s): BCH 110C; ENVC 107A; ENVC 201; or consent of instructor. Biochemical and physiological mechanisms underlying toxicity of selected toxics. The interaction of toxics with subcellular components and macromolecules with emphasis on mechanism of action, in particular neurotoxicity of pesticides, chemical carcinogens, mutagens, and teratogens. Gill, Grossosky

ENTX 203. Toxicology Laboratory. (3) S Lecture, one hour; laboratory, six hours. Prerequisite(s): BCH 110A and ENVC 201 or consent of instructor. Laboratory methods for the determination of toxicity of chemicals and techniques to determine the interaction of toxics with biochemical and physiological processes.

ENTX 205. Biotransformation of Organic Chemicals. (4) Lecture, four 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 enzymes. (GC), GC/mass spectrometry, and GC/Fourier transform infrared spectroscopy is emphasized. Arey

ENTX 207. Environmental and Molecular Carcinogenesis. (3) Lecture, three hours. Prerequisite(s): CHEM 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. Grossosky

ENTX 215. Toxins in Aquatic Media. (3) Lecture, three hours. Prerequisite(s): CHEM 112A, CHEM 112B, CHEM 112C, CHEM 246/ENVC 200/ENTX 200. Analysis of loss pathways for toxic chemicals present in surface waters, soil or groundwater. Includes chemical and biological degradation and transformation reactions, transport through soil, absorption to solid phases, and volatilization to the atmosphere. Farmer

ENTX 216. Biodegradation of Xenobiotic Chemicals. (3) Lecture, three hours. Prerequisite(s): BCH 100, BIOL 121A/MCLB 121A, BIOL 121L/MCLB 121L; or equivalents. Explores the importance of microorganisms in metabolizing synthetic organic chemicals. Topics include ecology, physiology, growth, isolation, and identification of degradative bacteria; bioremediation processes; and environmentally related problems. Examines studies of catabolic pathways including metabolites, enzymes, genes, and environmental factors. Cross-listed with MCLB 216L and SWSC 216L. Focht

ENTX 244. Airborne Toxic Chemicals. (3) Lecture, one hour; laboratory, three hours. Prerequisite(s): CHEM 109 or CHEM 110A, and CHEM 110B, CHEM 135/ENVC 135; or consent of instructor. Atmospheric chemistry of airborne chemicals. Intermedia partitioning. Structure of the atmosphere. Gas-particle distributions of chemicals, and wet and dry deposition of gases and particles. Atmospheric reactions of organic compounds, with emphasis on toxics. Theoretical and experimental methods for the determination of atmospheric lifetimes and products of chemicals. Cross-listed with CHEM 244. Atkinson

ENTX 245. Chemistry and Physics of Aerosols. (3) F, Odd Years Lecture, three 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 270. Seminar in Environmental Toxicology. (1) F, W, S Seminar, one hour. Prerequisite(s): graduate status in Environmental Toxicology. Lectures by visiting scholars and staff on current research topics in Environmental Toxicology. Gradated Satisfactory (S) or No Credit (NC). May be repeated for credit. Ziemann

ENTX 290. Directed Studies. (1-6) Research, three to eighteen hours. Prerequisite(s): graduate status in Environmental Toxicology. Literature or research topics under direction of the staff. Gradated Satisfactory (S) or No Credit (NC). May be repeated for credit.

ENTX 297. Directed Research. (1-6) Research, three to eighteen 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
Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies section for requirements that students must satisfy.

Major Requirements

The Ethnic Studies Departments 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 (8 units)
   a) ETST 001
   b) One course chosen from ETST 002, ETST 003, ETST 005, or ETST 007

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) An minimum of two courses chosen from ETST 104, ETST 106, ETST 109I, ETST 123, ETST 125, ETST 133, ETST 157, ETST 158
   c) Twenty (20) additional upper-division units in Ethnic Studies courses chosen from the following four areas of emphasis
      (1) African American Studies
      (2) Asian American Studies
      (3) Chicano Studies
      (4) Native American Studies
   d) 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.

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 (8 units)
   a) ETST 001
   b) ETST 005

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) ETST 106 and 133
   c) Twenty (20) additional upper-division units in Ethnic Studies chosen from courses focusing on the Asian American experience
   d) 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 (8 units)
   a) ETST 001
   b) ETST 002 or ETST 004/HIST 004

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) ETST 125, ETST 129
   c) Twenty (20) additional upper-division units in Ethnic Studies chosen from courses focusing on the Chicano experience
   d) A minimum of one Ethnic Studies course chosen from two of the following four areas of emphasis (8 units)
      (1) African American Studies
      (2) Asian American Studies
      (3) Native American Studies
      (4) Comparative Issues

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 (8 units)
   a) ETST 001
   b) ETST 003

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) ETST 104 and 109I
   c) Twenty (20) additional upper-division units in Ethnic Studies chosen from courses focusing on the African American experience

Note No internship courses may be counted toward the upper-division electives in Ethnic Studies.

subject abbreviation: ETST

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Dylan Rodríguez, Ph.D.

Ethnic Studies

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 a general emphasis in Ethnic Studies or a concentration on a specific group. The majors prepare students to pursue careers that require knowledge and expertise relative to the history, culture, and socioeconomic status of racial/ethnic groups in contemporary society.

With the changing ethnic composition of society there 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 can be used to prepare students for graduate or professional school as well as for careers in a number of areas including education, corrections, law, human services, social welfare, urban planning, and state and county government.

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies section for requirements that students must satisfy.

Major Requirements

The Ethnic Studies Departments 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 (8 units)
   a) ETST 001
   b) One course chosen from ETST 002, ETST 003, ETST 005, or ETST 007

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) An minimum of two courses chosen from ETST 104, ETST 106, ETST 109I, ETST 123, ETST 125, ETST 133, ETST 157, ETST 158
   c) Twenty (20) additional upper-division units in Ethnic Studies courses chosen from the following four areas of emphasis
      (1) African American Studies
      (2) Asian American Studies
      (3) Chicano Studies
      (4) Native American Studies
   d) A minimum of one Ethnic Studies course 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.

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 (8 units)
   a) ETST 001
   b) ETST 005

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) ETST 106 and 133
   c) Twenty (20) additional upper-division units in Ethnic Studies chosen from courses focusing on the Asian American experience
   d) 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 (8 units)
   a) ETST 001
   b) ETST 002 or ETST 004/HIST 004

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) ETST 125, ETST 129
   c) Twenty (20) additional upper-division units in Ethnic Studies chosen from courses focusing on the Chicano experience
   d) A minimum of one Ethnic Studies course chosen from two of the following four areas of emphasis (8 units)
      (1) African American Studies
      (2) Asian American Studies
      (3) Native American Studies
      (4) Comparative Issues

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 (8 units)
   a) ETST 001
   b) ETST 003

2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) ETST 104 and 109I
   c) Twenty (20) additional upper-division units in Ethnic Studies chosen from courses focusing on the African American experience

Note No internship courses may be counted toward the upper-division electives in Ethnic Studies.
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 (8 units)
   a) ETST 001
   b) ETST 007
2. Upper-division requirements (48 units)
   a) ETST 100, ETST 131, ETST 191R
   b) ETST 157 and 158
   c) Twenty (20) additional upper-division units in Ethnic Studies chosen from courses focusing on the Native American experience
   d) A minimum of one Ethnic Studies course chosen from two of the following four areas of emphasis (8 units)
      (1) African American Studies
      (2) Asian American Studies
      (3) Chicano Studies
      (4) Comparative Issues

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

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, ETST 191R
   b) Eight (8) 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 Undergraduate Studies 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 units):
   a) ETST 191R
   b) Sixteen (16) additional upper-division units in Ethnic Studies focusing on African Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies 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 units):
   a) ETST 191R
   b) Sixteen (16) additional upper-division units in Ethnic Studies focusing on Asian Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies 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 units):
   a) ETST 191R
   b) Sixteen (16) additional upper-division units in Ethnic Studies focusing on Chicanos

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies 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 units):
   a) ETST 191R
   b) Sixteen (16) additional upper-division units in Ethnic Studies focusing on Native Americans

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

**Education Abroad Program**

The Ethnic Studies Department encourages students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available.

While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California's EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

**LOWER-DIVISION COURSES**

**ETST 001. Introduction to the Study of Race and Ethnicity.** (4) Lecture, three hours; discussion, one 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 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, three hours; discussion, one 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, three hours; discussion, one hour. This course provides an overview of the Chicano experience from 1848 to the present. The Chicano experience is compared and contrasted with the experiences of the dominant society and those of other racial and ethnic groups. 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, three hours; discussion, one 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, three hours; extra reading, three 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, three hours; discussion, one 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. Honors course corres. 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 American Studies in Comparative Perspective. (4) Lecture, three hours; discussion, one 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 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, three hours; discussion, one 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 European society and those of other racial and ethnic groups. Fulfills either the Humanities or the 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, three hours; discussion, one 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 European 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, three hours; term paper, three 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 students to cultural works such as essay, film, theatre, music, poetry, and art. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 012. Religious Myths and Rituals. (4) Lecture, three hours; discussion, one 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. Religious beliefs and expressions are examined from diverse cultural perspectives. Source materials are drawn 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 or ETST 012H/RLST 012H. 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, three hours; discussion, one hour; extra reading, three hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. An introduction to the meanings, origins, and functions of religion; the roles of myths, rituals, and symbols; and images of transcendence; and understanding religious beliefs and expressions from diverse cultural perspectives. Source materials are drawn from indigenous Native (North and South) American, African American, and/or Asian American religions. Cross-listed with RLST 012H. Credit is awarded for only one of ETST 012/RLST 012 or ETST 012H/RLST 012H. Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both. O'Connor

ETST 014. Popular Musics of the World. (4) Lecture, three hours; discussion, one 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. Fulfills the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both. O'Connor

ETST 061. Martin Luther King, Jr. (4) Lecture, three hours; extra reading, three 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, three hours; term paper, three 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.

ETST 100. Race and Ethnicity in a Comparative Perspective. (4) Lecture, three hours; extra reading, three 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 102. The Political Economy of Race and Class. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, three 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 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, three hours; extra reading, three hours. Prerequisite(s): 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, three hours; extra reading, three 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 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, three hours; term paper, three 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 race and assimilation paradigms 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 culture. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 107. Blacks in America: Assimilation vs. Separation. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): consent of instructor. An analytical survey of the themes of assimilation and separation in the history of Blacks in the United States. 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, three hours; individual study, three hours. Prerequisite(s): consent of instructor. Selected topics in E. Culture, Ethnicity, and change; F. Conditions of Education for Chicanos; I. Mexican Immigration and the Chicano Community; L. The Labor and Legal History of the Chicano; M. Careers: Personal, Cultural, and Ethnic Factors; P. Chicano Politics and Theatre. See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

ETST 109 (E-Z). Special Topics in African American Studies. (1-4) Lecture, one to three hours; extra reading, three hours. Prerequisite(s): ETST 003, upper-division standing; or consent of instructor. Selected topics addressing the issues of the African American experience. 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 110 (E-Z). Special Topics in Asian American Studies. (1-4) Lecture, one to three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor; ETST 005 for ETST 110M. Selected topics addressing the issues of the Asian American experience. Reading, research, and discussion on the Asian American experience. E. Japanese American Internment During World War II; G. Community Research: Asian American Community; I. The Korean American Experience; K. Foreign Policy and Asian Americans; M. Comparative History of the Asian Experience in America. See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

ETST 111. Ethnic Politics: Practicum in Political Change. (4) Lecture, three hours; practicum, three hours. Prerequisite(s): upper-division standing or consent of instructor. Studies theories and practices of comparative ethnic political change. Examines the theoretical understanding of how to effect political change within the Chicano, African American, Asian American, Native American, and other ethnic communities, as well as the domi-
ETST 112. The Civil Rights Movement, 1950-1970. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of African American experience during the civil rights movement of the 1950s and 1960s. The major focus will be on the "grass roots." African American aspects of the "Movement," as it was popularly known, from school segregation 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. The African American Woman. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Uses professional literature of the social sciences and American history and other media to examine the achievements, myths, and stereotypes of the African American woman from her roots in African 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, three hours; term paper, three 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 chosen. 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, three hours, individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Selected topics addressing the issue of the Native American. Includes reading, research, and discussion. On the Native American experience. E. Early America: Emerging Interpretations. Cross-listed with HISA 144 (E-Z). See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

ETST 116. Disease, Death, and Survival in the Native American Experience. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of African American experience during the ages of pestilence and famine, and major shifts in native health, particularly during the twentieth century. Credit is awarded for only one of ETST 116 or HISA 147. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.


ETST 118. Music Cultures of Africa. (4) Lecture, three hours, extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of African performance, addressing the large culture areas of the continent. Emphasis on African aesthetic, special attention is paid to 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, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates the political, economic, and ideological systems—during the twentieth century. Examines the temporal and spatial impact of 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 transculturation, black Indians as outlaws, and blacks and Indians in a modern educational context. Fulfills the Social Science requirement of the College of Humanities, Arts, and Social Sciences.

ETST 120. Contemporary Native American Literature. (4) Lecture, three hours; extra reading, three 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, 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An 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 Science requirement for the College of Humanities, Arts, and Social Sciences.

ETST 122. Family, Sex Roles, and the Chicano. (4) Lecture, three hours; extra reading, three 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 Science requirement for the College of Humanities, Arts, and Social Sciences.

ETST 123. Chicano Politics in Comparative Perspective. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the Chicano political experience to that of other racial and ethnic groups in the United States from Mexican independence in 1821 to the present. Assesses the continuity of the Chicano political tradition before and after the establishment of American sovereign-
eductional problems; 2) the family; 3) religion; and 4) the relationship between Vietnamese Americans and other racial ethnic groups (African Americans, Native Americans, Anglo, and Chicano). Fulfills either the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences, but not both.

ETST 138. American People Through Their Literature. (4) Lecture, three hours; term paper, three 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 poetry, short stories, and plays that focus on socioeconomic and political struggles of the Asian American communities and peoples. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

ETST 139. Contemporary Issues in the Asian American Community. (4) Lecture, three terms; term paper, three 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, poverty, family structure, generational conflicts, and anti-Asian violence. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 140. American Women. (4) Lecture, three terms; term paper, three 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, three hours; term paper, three hours. Prerequisite(s): 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 will focus 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, three hours; term paper, three hours. Prerequisite(s): consent of instructor. 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, Harala, and others. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

ETST 142. Organizations, Institutions, and the Chicano. (4) Lecture, three hours; extra reading, three 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. Filipino American History: Pre-1898 through 1941. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. History of the Filipino American experience beginning in 1898. Analyzes Filipino American contributions, the factors which contributed to Filipino immigration at the beginning of the twentieth century, the evolution of Filipino communities in Hawaii and California before World War II and the effects of the war on the status of Filipino immigrants. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.


ETST 143C. Filipino Social Movements. (4) Lecture, three terms; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of Filipino social movements in both historical and contemporary contexts. Discusses socioreligious, labor, and political movements and analyses and interprets the relationship between Philippine-rooted social movements and the Filipino immigration experience. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 144. Race and Ethnicity in Hawaii. (4) Lecture, three hours; individual study, three 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, three hours; field, six hours. Prerequisite(s): ETST 001 or upper-division standing. In-depth analysis of the history of American colonial interaction, the factors which contributed to its demise. Cross-listed with EDUC 146. Does not fulfill the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 146. Educational Perspectives on the Chicano. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing. 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, three hours; individual study, four 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. Fulfills the Humanities or Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 148. Caribbean Culture and Society. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three 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 evolution of race struggle in America, the Caribbean, and Africa. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

ETST 150. American Family and Culture. (4) Lecture, three terms; term paper, three 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 153. Contemporary Latin American and Chicano Novels. (4) Lecture, three hours; term paper, three 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, three hours; extra reading, three 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.

ETST 155. Chicano/Chicana California: A Social and Cultural History. (4) Lecture, three hours; extra reading, three 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 Chicano impact upon regional culture and American society as a whole.

ETST 156. Politics of the Chicano Movement. (4) Lecture, three hours; term paper, three 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 sources, 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, three hours; term paper, three 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 policies of forcible 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, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected 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 161. U.S. Latinos: Crossing Borders, Crossing Cultures. (4)
Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on historical chronology, literary identity as a way to study heterogeneity of ethnic group. Cross-listed with WRLT 170. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

ETST 163. Social Forces and the Educational Condition of Chicanos. (4)
Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the social forces that have shaped the Chicanos’ educational condition and evaluates models in the sociology of education that explain variation. Cross-listed with SOC 163. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 164. Personality Development in Chicano Children. (4)
Lecture, three hours; extra reading, three hours. Prerequisite(s): PSYC 002. Analyzes the affective and intellectual aspects of personality development as they pertain to the Chicano child. Examines the problems and rewards of an individual’s identity when two cultures are met. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 165. Sociolinguistics and the Chicano Community. (4)
Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the regional and social variation in language use within the Chicano community. Specific issues addressed are the maintenance of Spanish language use, private versus language use, the need for bilingual social services, language as a human right versus language as a commodity, and the political economy of language use. General sociolinguistic theory and methodology are also addressed. Cross-listed with SOC 165. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 166. Issues in Bilingual/Bicultural Education. (4)
Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or 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, three hours; extra reading, three 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, three hours; extra reading, three 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 170. Third World Literature. (4)
Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Analyses 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, three hours; term paper, three 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, 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, three hours; extra reading, three 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, DGNE 127, and MIS 127. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

ETST 173. Black Art in America. (4)
Lecture, three hours; field, three hours. Prerequisite(s): consent of instructor. 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.

Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines how the survival of African spiritual beliefs and practices affects the realities of African-Americanicans in the New World. Examines various institutions and religious systems such as Santeria, Voodoo, and articulations of the Black Consciousness movement. Cross-listed with WRLT 174. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

ETST 175. Gender, Ethnicity, and Borders. (4)
Lecture, three hours; extra reading, three hours. Prerequisite(s): ETST 001 or WMST 010 or upper-division standing. Examines legal, theatrical, and visual sites where the “in-between” space of border cultures is mapped. Materials include autobiographies, testimonial literature, films, novels, performances, art, and art objects. The approach to gender and ethnicity is the specific 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, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. 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, three hours; extra reading, three 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-barrel for elected officials. Also analyzes anti-prison, prison reform, and penal abolitionist discourses.

ETST 178. U.S. Prison Intellectuals: Social Movements and Imprisoned Activists from the 1960s to the Present. (4)
Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the role of the imprisoned writers of color as well as white intellectuals/activists who have influenced the formation of social movements in the United States since the 1960s as prisons and jails have become primary sites of political and racial conflict. Elaborates how race, gender, and patriotism are central to the establishment of state regimes of incarceration.

ETST 179. Understanding Whiteness: Racialization and Identity Formation in American Culture. (4)
Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Explores analysis of U.S. racialization, 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.

ETST 180. California Indian History. (4)
Lecture, three hours; extra reading, three 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 time of the invasion of the Spanish to the twentieth century in the context of the changing geography 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, three hours; extra reading, three 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’odham, Yavapai, Chinicahuas, Navajos, Zunis, Hopes, 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected aspects of Northwestern Indian History, from approximately the 1740s to the twentieth century. Deals with several native groups along the Northwest coast from Alaska to Oregon. Examines the relationship of 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, three hours; extra reading, three hours. Prerequisite(s): ETST 007; upper-division standing or consent of instructor. Comparative examination of Native American oral literature of tribes in the Southwest, California, 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, three hours; consultation, one 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. Grin d e

ETST 185. Native American Law. (4) Lecture, three hours; extra reading, three 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. Grin d e

ETST 190. Special Studies. (1-5) Individual study, three to fifteen 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, three hours; term paper, three hours. Prerequisite(s): for ETST 191E, ETST 191G, ETST 191K, ETST 191R: consent of instructor; for ETST 191N: ETST 002 or ETST 008; for ETST 191S: upper-division standing or consent of instructor. Selected topics in the ethnohistories and cultures of African American, Chicano/Latino, and Native American ethnic groups. E. Native American History and Research; G. Chicano Psychology; K. Chicano Sociology; N. Chicano Literature: A Comparative Approach; R. Research Methodology; S. Black Aesthetics. See the Student Affairs Office in the College of Humanities, Arts, and Social Sciences for breadth requirement information.

ETST 192H. Junior Honors Seminar. (4) Seminar, three hours; term paper, three hours. Prerequisite(s): junior standing or consent of instructor. Advanced research in various fields of faculty interest and expertise. Students are required to complete the 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, three hours; term paper, three 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. Community Internship. (1-12) Internship, three to forty-eight hours. Prerequisite(s): upper-division standing and consent of instructor. Off-campus internship related to the interests of core ethnic group students in the community under the joint direction of an off-campus supervisor and an Ethnic Studies faculty member. May be repeated for credit up to a total of 16 units. No more than 8 units of ETST 198G may be counted toward completion of the major.

ETST 198-I. Individual Internship. (1-12) Internship, three to thirty-six hours. Prerequisite(s): upper-division standing and consent of instructor. Off-campus internship related to the ethnic community and conducted under the joint direction of an off-campus supervisor and an Ethnic Studies faculty member. Extensive report based on internship experience. One unit for every three hours per week spent in the internship. May be repeated for credit up to a total of 16 units. No more than eight units of ETST 198-I may be counted toward completion of the major.

GRADUATE COURSES

ETST 255. Critical Issues in Asian American Studies. (4) Seminar, three hours; individual study, three 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, three hours; practicum, three 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, one 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.

ETST 290. Directed Studies. (1-6) Scheduled research, three to eighteen 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.

PROFESSIONAL COURSE

ETST 302. Teaching Practicum. (1-4) Practicum, three to twelve hours. Prerequisite(s): limited to teaching assistants; graduate standing. Supervised teaching in lower- and upper-level courses. Required of all Ethnic Studies teaching assistants. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

FILM AND VISUAL CULTURE

Subject abbreviation: FVC

Carole-Anne Tyler, Ph.D., Chair
Program Office, 2417 Humanities and Social Sciences
(909) 787-2743
filmandvisualculture.ucr.edu

Professors
Amelia Jones, Ph.D. (Art History)
Carlos Morton, Ph.D. (Theatre)
Marina Pianca, Ph.D. (Hispanic Studies)
George E. Slusser, Ph.D. Comparative Literature (Comparative Literature and Foreign Languages)
Erika Suderburg, M.F.A. (Art)
Marguerite R. Waller, Ph.D. (English)
Christine Ward Gailey, Ph.D. (Women’s Studies/Anthropology)

Associate Professors
Alicia Arzitó, Ph.D. (Ethnic Studies/Women's Studies)
Piya Chatterjee, Ph.D. (Women's Studies)
Paul H. Gelles, Ph.D. (Anthropology)
Stephanie B. Hammer, Ph.D. Comparative Literature and Germanic Studies (Comparative Literature and Foreign Languages)
Katherine A. Kinney, Ph.D. (English)
Carole-Anne Tyler, Ph.D. (English)
Deborah A. Wong, Ph.D. (Music)

Assistant Professors
Michele Bloom, Ph.D. Comparative Literature and French (Comparative Literature and Foreign Languages)
Christopher Bolton, Ph.D. (Comparative Literature and Foreign Languages)
Jennifer Doyle, Ph.D. (English)
Josh Kun, Ph.D. (English)
René T.A. Iyloff, Ph.D. (Music)
Amy A. Ongiri, Ph.D. (English)

Assistant Professors
Timothy Labor, Ph.D.
Anna B. Scott, Ph.D. (Dance)
Patricia O'Bri en, Ph.D.
Dean, College of Humanities, Arts, and Social Sciences, ex officio

MAJOR

The Film and Visual Culture major provides 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 Film and Visual Culture 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 will 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.

Degree Requirements

University Requirements
See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements
See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.
Major Requirements
The B.A. in Film and Visual Culture involves three possible tracks of courses, each with different emphases in curriculum. The requirements are as follows:
For all three tracks:
1. Lower-division requirements (16 units):
   a) Film, Photography, and Media History (8 units)
      AHS 181; AHS 182; FVC 110 (E-Z);
      FVC 145 (E-Z)/ENGL 145 (E-Z);
      FVC 172 (E-Z) or FVC 173 (E-Z)/
      CPLT 173 (E-Z); FVC 176/AIDS 176;
      FVC 177/AIDS 174; FVC 180/AIDS 180,
      with relevant course material
b) Non-Hollywood Cinema and Media (12 units)
   AHS 182, ART 136, AST 185/CHN 185,
   ETST 170/WRLT 170, ETST 175/
   WMST 175, FVC 135/ART 135,
   FVC 170 (E-Z)/DNCE 170 (E-Z),
   FVC 173 (E-Z)/CPLT 173 (E-Z),
   FVC 176/AIDS 176, FVC 184/
   AST 184/CPLT 184/JPN 184,
   ETST 183/HISA 143, FVC 103/
   ART 146 (E-Z), ART 147/ART 145,
   FVC 144 (E-Z)/ENGL 144 (E-Z),
   FVC 147/ART 145, HIST 102, HIST 238A,
   ETST 170/WRLT 170, FVC 143 (E-Z)/
   ENGL 143 (E-Z); FVC 144 (E-Z)/
   ENGL 144 (E-Z); FVC 160/ART 160,
   FVC 170 (E-Z)/DNCE 170 (E-Z),
   FVC 172 (E-Z), FVC 180/AIDS 186
d) Film and Media Theory (4 units)
   ART 146 (E-Z), FVC 105 (E-Z),
   FVC 139/SOC 139, FVC 143 (E-Z)/
   ENGL 143 (E-Z); FVC 144 (E-Z)/
   ENGL 144 (E-Z); FVC 170 (E-Z)/
   DNCE 170 (E-Z), FVC 172 (E-Z),
   FVC 180/AIDS 186
2. Upper-division requirements (40 units):
   a) Film, Photography, and Media History (8 units)
      AHS 181; AHS 182; FVC 110 (E-Z);
      FVC 145 (E-Z)/ENGL 145 (E-Z);
      FVC 160/ART 160; FVC 172 (E-Z) or
      FVC 173 (E-Z)/CPLT 173 (E-Z),
      if appropriate topic; FVC 176/AIDS 176;
      FVC 177/AIDS 174; FVC 180/AIDS 180,
      with relevant course material
   b) Non-Hollywood Cinema and Media (12 units)
      AHS 182, ART 136, AST 185/CHN 185,
      FVC 135/ART 135, FVC 170 (E-Z)/
      DNCE 170 (E-Z), FVC 173 (E-Z)/
      CPLT 173 (E-Z); FVC 176/AIDS 176,
      FVC 184/ART 184/CPLT 184/JPN 184,
      GER 118 (E-Z)
   c) Film and Media Theory (4 units)
      ART 146 (E-Z), FVC 105 (E-Z),
      FVC 139/SOC 139, FVC 143 (E-Z)/
      ENGL 143 (E-Z); FVC 144 (E-Z)/
      ENGL 144 (E-Z); FVC 160/ART 160,
      FVC 170 (E-Z)/DNCE 170 (E-Z),
      FVC 172 (E-Z), FVC 180/AIDS 186
d) Studies in Film, Literature, and Culture (16 units):
   ETST 170/WRLT 170, FVC 143 (E-Z)/
   ENGL 143 (E-Z); FVC 144 (E-Z)/
   ENGL 144 (E-Z); FVC 170 (E-Z)/
   DNCE 170 (E-Z), FVC 172 (E-Z),
   ETST 170/WRLT 170, FVC 143 (E-Z)/
   ENGL 143 (E-Z); FVC 144 (E-Z)/
   ENGL 144 (E-Z); FVC 160/ART 160,
   FVC 170 (E-Z)/DNCE 170 (E-Z),
   FVC 172 (E-Z), FVC 180/AIDS 186
   At least 4 but not more than 8 units from the following:
   ENGL 142 (E-Z), EUR 115F,
   EUR 119 (E-Z), FREN 109C,
   FREN 109D, FREN 182, FREN 183
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 (16 units):
   a) FVC 020, FVC 021/WRLT 021
   b) One course from the following:
      FREN 045, FVC 025/ENGL 021/
      THEA 021 or AST 048/CHN 048 or
      RUSN 045, GER 045, ITAL 045
   c) One lower-division film elective
2. Upper-division requirements (40 units):
   a) Film, Photography, and Media History (8 units)
      FVC 182, FVC 110 (E-Z),
      FVC 145 (E-Z)/ENGL 145 (E-Z),
      FVC 170 (E-Z)/DNCE 170 (E-Z),
      FVC 173 (E-Z)/CPLT 173 (E-Z),
      if appropriate topic; FVC 176/AIDS 176;
      FVC 177/AIDS 174; FVC 180/AIDS 180
   b) Non-Hollywood Cinema and Media (12 units)
      AHS 182, ART 136, AST 185/CHN 185,
      ETST 170/WRLT 170, FVC 135/
      ART 135, FVC 170 (E-Z)/
      DNCE 170 (E-Z), FVC 173 (E-Z)/
      CPLT 173 (E-Z); FVC 176/AIDS 176,
      FVC 184/AST 184/CPLT 184/JPN 184,
      GER 118 (E-Z)
   c) Ethnography and Documentary: Theories, Texts, and Production (20 units)
      ANTH 254/WMST 254 (permission of
      instructor), ART 146 (E-Z),
      ENGL 121 (E-Z), ETST 175/WMST 175,
      ETST 183/HISA 143, FVC 103/
      ANTH 103, FVC 140/ART 140,
      FVC 147/ART 145, FVC 160/ART 160,
      FVC 144 (E-Z)/ENGL 144 (E-Z),
      FVC 147/ART 145, HIST 102, HIST 238A,
      HIST 238B (HIST 238A and HIST 238B
      need permission of instructor)
   Production and Methods: At least 8 units
   must be taken from the following courses.
   ANTH 254/WMST 254 (permission of
   instructor), ART 146 (E-Z),
   FREN 109D, FREN 182, FREN 183
5. Ethnography and Documentary: Theories, Texts, and Production (20 units)
   ANTH 254/WMST 254 (permission of
   instructor), ART 146 (E-Z),
   ENGL 121 (E-Z), ETST 175/WMST 175,
   ETST 183/HISA 143, FVC 103/
   ANTH 103, FVC 140/ART 140,
   FVC 147/ART 145, FVC 160/ART 160,
   FVC 144 (E-Z)/ENGL 144 (E-Z),
   FVC 147/ART 145, HIST 102, HIST 238A,
   HIST 238B (HIST 238A and HIST 238B
   need permission of instructor)
   Theories and Texts: At least 8 units
   must be taken from the following courses:
   ENGL 121 (E-Z), ETST 175/WMST 175,
   ETST 183/HISA 143, FVC 143 (E-Z)/
   ENGL 143 (E-Z); FVC 144 (E-Z)/
   ENGL 144 (E-Z); FVC 160/ART 160,
   FVC 170 (E-Z)/DNCE 170 (E-Z),
   FVC 172 (E-Z), FVC 180/AIDS 186
   The following courses may be taken as a
   part of any track in order to meet individ-
   ual needs: FVC 190, FVC 198-I.
Minor
The Film and Visual Culture 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
Includes lectures, discussions, readings, screenings, three hours every other week; extra reading, three hours.

1. Lower-division requirements (4 units) from the following:
   a) FVC 004/ART 004
   b) FVC 020, FVC 021/WRLT 021

2. Upper-division requirements (20 units):
   a) One course from each of the following three groups:

(1) Non-Hollywood Cinema
   FVC 135/ART 135, FVC 173 (E-Z)/CPLT 173 (E-Z)

(2) Film and Media History
   FVC 110 (E-Z), FVC 145E/ENGL 145E, FVC 186/AHS 186

(3) Film and Media Theory
   FVC 105 (E-Z), FVC 143 (E-Z)/ENGL 143 (E-Z), FVC 144 (E-Z)/ENGL 144 (E-Z), FVC 145F/ENGL 145F, FVC 172 (E-Z)

b) Choose two additional courses from the three groups above or from the following courses:
   FVC 166/CRTW 166/THEA 166, FVC 170 (E-Z)/DNCE 170 (E-Z), FVC 174 (E-Z)/CPLT 174 (E-Z)

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

LOWER-DIVISION COURSES

FVC 004. Introduction to Video Art. (4) Lecture, two hours; screening, six hours. Prerequisite(s): none. An introduction to video as an art form based in production and contemporary media theory. Basic production techniques, operation of the camcorder and the fundamentals of live-action production, and editing. A series of screenings, readings, and discussions examine documentary, experimental, and other applications of the media arts in relation to contemporary art practice and such new genres as installation and performance. Cross-listed with ART 004. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 006. Introduction to Contemporary Critical Issues in Art. (4) Lecture, three hours; field trip, three hours every other week; extra reading, three hours. Examines basic principles and methodologies of theory as applied to the interpretation and creation of works of art. Includes lectures, discussions, readings, screenings, gallery visits, and creative work. Cross-listed with ART 006. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 007. Introduction to Digital Imaging. (4) Lecture, three hours; laboratory, three hours. Introduction to making art by utilizing the Macintosh computer. Emphasis is on the personal, theoretical, and conceptual implications of such work within the broader field of contemporary art. Cross-listed with ART 007. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 008. Modern Western Visual Culture. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. Focusing on broadly defined cultural trajectories—including painting, photography, video, architecture, and film—this course introduces the major historical, aesthetic, and theoretical issues in twentieth-century visual culture with an eye to both critical and social themes relevant to contemporary life. Cross-listed with AHS 008. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 009. Music in Movies and TV. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. An exploration of popular film and TV soundtrack music, emphasizing drama and musical style. Cross-listed with MUS 007. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 020. Introduction to Film Studies. (4) Lecture, three hours; screening, three 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 author and genre theory. Provides an overview of world cinemas. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 021. Introduction to Film, Literature, and Culture. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. Surveys critical approaches to the cinema such as auteur and genre theory. Studies literary and filmic narratives and film movements. Cross-listed with WRLT 021. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 022. Introduction to Japanese Film. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. An introduction to Japanese cinema 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, JPN 022, and WRLT 022. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 025. Culture Clash: Studies in Latino Theatre and Film. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. An introduction to U.S. Latino theatre and film from 1965 to the present. Students study the major works of authors and examine important films and videos. Cross-listed with ENGL 021 and THEA 021. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 026. From Hamlet to Babylon 5: Introduction to Design in Film, Television, and Theatre. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. An introduction to the design process for film, television, and theatre. Through exercises, lectures, videos, and on-site visits, students explore the design process, the influence of design on the viewer, and how looks are achieved in different media. Cross-listed with ART 026, JPN 026, and WRLT 022. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 066. Screenwriting: An Introduction and Survey. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. Introduces screenwriting and the ways in which screenplays impact society. Examines a wide range of films, from early silent films to modern mini-series, hour-long dramas, sitcoms, and animation productions. Cross-listed with CRTW 066 and THEA 066. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

UPPER-DIVISION COURSES

FVC 103. Introduction to Visual Anthropology. (4) Seminar, three hours; outside research and projects, three hours. Prerequisite(s): ANTH 001 or ANTH 001H or consent of instructor. An introduction to the rapidly growing 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.

FVC 105 (E-Z). Film and Media Theory. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. Covers different types of film and media theory. Addresses psychoanalytic film theory and feminist, Marxist, and formalist approaches to the cinema and other media. E Film Theory and Aesthetics. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 110 (E-Z). Topics in Film and Media History. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. Considers specialized topics in the history of film and the media. Focuses on the sociopolitical and economic implications of the various aspects of film and media. E The FifItles: Images of American Society in Film; G Film History: Styles and Contexts; S Industrial Light and Magic: The Social History of Special Effects. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 131. Photography and Digital Technology. (4) Lecture, three hours; laboratory, four hours. Prerequisite(s): ART 003, ART 007/FVC 007. An intermediate course in photo and digital technologies with a range of photographic applications. Covers the complete cycle of production from scanning to output. Emphasis is placed on developing skill in creating digital photographic imagery for creative, cultural expression. Software and some digital equipment are provided. Students are required to furnish their own 35mm single lens reflex (SLR) or digital cameras and zip disks. Cross-listed with ART 131. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 135. Intermedia: Art, Media, and Culture. (4) Lecture, two hours; screening, six hours. Prerequisite(s): upper-division standing or consent of instructor. A study of performance, photography, video, film, television, installation, and other related “intermedias.” Through field trips, screenings, readings, and discussion focuses on artworks within and without the mass media: how they are constructed, written about, and viewed in the larger culture of contemporary art. Cross-listed with ART 135. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 136. Installation and Site-Specific Art. (4) Lecture, three hours; studio, three 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 through screenings, readings, discussion, and critique. 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.

FVC 139. Mass Media and Popular Culture. (4) Lecture, three hours; discussion, one hour; consultation, one hour. Prerequisite(s): SOC 001. 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 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.

FVC 140. Intermediate Photography. (4) Lecture, two hours; studio, four hours. Prerequisite(s): ART 003 or equivalent. Focuses on projects and assignments to develop individual creative approaches in photography and strengthen controls and techniques in black and white printing. Students are required to furnish their own cameras. Course is repeatable to a maximum of 8 units.
FVC 143 (E-Z). Gender, Sexuality, and Visual Cultures. (4) Lecture, three hours; screening, three 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. Weekly screenings and readings. E. Feminist Film Theory and Practice; F. Film and Gender; G. Screening with ENG 143 (E-Z). Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 144 (E-Z). Race, Ethnicity, and Visual Culture. (4) Lecture, three hours; screening, three 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. Course is repeatable to a maximum of 8 units. Cross-listed with ENG 144 (E-Z). Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 145 (E-Z). Special Topics in Film and Visual Culture. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. Intensive formal, historical, and theoretical analysis of a theme or issue in film, media, television, and visual culture. Weekly screenings and readings. E. Mass Culture and Counter Culture; F. Television and American Culture; G. Film as Writing and Writing as Film; J. Liberal Hollywood and the Horror Film. Cross-listed with ENG 145 (E-Z). Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 147. Advanced Photography Workshop. (4) Lecture, two hours; studio, four hours. Prerequisite(s): ART 140; consent of instructor. A study of experimental advanced photographic techniques, including examination of critical and creative problems. Course is repeatable to a maximum of 12 units. Cross-listed with ART 145. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 150. Intermediate Video Art. (4) W5 Lecture, two hours; studio, four hours. Prerequisite(s): ART 160 or consent of instructor. An intermediate course in video art production and theory. Develops continuing work done in ART 007/FVC 007. Screenings, readings, and discussions. 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 8 units. Cross-listed with ART 150. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 160. Intermediate Art Theory. (4) Lecture, three hours, extra reading, three hours. Prerequisite(s): ART 006/FVC 006 recommended. Discusses current critical and theoretical issues in modern and contemporary art. Examines student's art production in light of contemporary art practice and in relation to the interpretation and creation of historical issues of race, gender, politics, aesthetics, class, and sexuality. Cross-listed with ART 160. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 166A. Screenwriting: Introduction. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): CRWT 005 or consent of instructor. Explores the fundamentals of screenwriting including story development, plot, and characterization as they are used in creating a complete script for television or feature film. Cross-listed with CRWT 166A/THIA 166A. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 166B. Screenwriting: Outline to First Draft. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): CRWT 166A/FVC 166A/THIA 166A or consent of instructor. Explores the fundamentals of screenwriting including story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Cross-listed with CRWT 166B/THIA 166B. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 166C. Screenwriting: Revisions and Writing for Television. (4) Lecture, two hours, discussion, two hours. Prerequisite(s): CRWT 166B/FVC 166B/THIA 166B or consent of instructor. Explores the fundamentals of screenwriting including 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/THIA 166C. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 170 (E-Z). Dance and Visual Studies. (4) Lecture, three hours; screening, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. Addresses the intersections between the movement arts and their various manifestations in film, video, photography, and other visual media in a given cultural or historical context. E. Movement Performance, Video/Film, and the Body; F. Surrealism and Other Cinematic Bodies; G. Mechanizations of the Body; H. Women’s Cinema and Body Politics; J. Architecture, Film, and Movement Performance; K. European Cinema and Performance; M. Popular Culture, Dance, and MTV; N. Politics of Dance: A Cinematographic Approach. Cross-listed with DNCE 170 (E-Z). Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 171. Reel to Real: Latin American Film and Social Change. (4) Seminar, three hours; individual study, one hour; screening, one and a half hours; term paper, half hour. 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.

FVC 172 (E-Z). Topics in Film and Media Genres. (4) Lecture, three hours; screening, three hours. Prerequisite(s): upper-division standing or consent of instructor. An intensive examination of a variety of film and media genres and critical approaches to these genres. E. Science Fiction and Film; G. Film and the Holocaust; M. Film Melodrama; R. Horror in the Cinema. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 173 (E-Z). International Cinemas. (4) Lecture, three hours; screening, three hours. Prerequisite(s): 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; G. New German Cinema; I. Italian Neorealism; T. Third World Cinema. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 174 (E-Z). Comparative Studies in Film. (4) Lecture, three hours; screening, three 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 CPLE 174 (E-Z). Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 175. Advanced Digital Imaging. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): ART 007/FVC 007; knowledge of Macintosh interface and Adobe Photoshop. An advanced studio and production course in digital imaging which proceeds from techniques initiated in ART 067/FVC 067. Emphasizes the use of computer and electronic technology as a tool for making art. Addresses issues related to making art and the cultural implications of digital technology through class projects, reading, lectures by visiting artists, field trips, and critiques of work in progress. Course is repeatable to a maximum of 8 units. Cross-listed with ART 175. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 176. Pictorialism to New Media: A History of Twentieth-Century Photography. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): HIS 017C or upper-division standing or consent of instructor. A study of the development of photography from proto-photographic viewing devices through its formulation as an artistic medium around 1900. Examines photographic techniques in scientific, artistic, commercial, and political contexts. Cross-listed with HIS 174. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 181. Existentialism in Literature, Film, and Culture. (4) Lecture, three hours; scheduled screening, two hours; research paper, one-half hour; term paper, one-half hour. Prerequisite(s): upper-division standing or consent of instructor. Explores the Existentialist movement in literature, film, and culture. Tests range from essays, plays, and novels to documentary and fiction film. Topics include choice, subjectivity, and alienation. Cross-listed with FREN 181 and WRLT 181.

FVC 184. Japanese Film and Visual Culture. (4) Lecture, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Investigates popular visual culture in Japan primarily through film, from the early masters to contemporary directors. Additional material may be drawn from fields such as theoretical studies of popular culture, architecture, and illustrated fiction. All materials read or viewed in English. Course is repeatable to a maximum of 12 units. Cross-listed with AST 184, CPTL 184, and JPN 184. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 186. Media and Movements: Film, Video, Photography, and the Visual Arts. (4) Lecture, three hours; screening, three hours. Prerequisite(s): HIS 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, giving 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 HIS 186. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

FVC 187. Visual Culture and Art History. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): HIS 017C or AHS 017B or HIS 017C or HIS 021/ERST 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 four conceptual areas: visuality, identity, media culture, and politics/ethics. Cross-listed with AHS 187.
FVC 190. Special Studies. (1-4) Consultation, one hour; individual study, three to six hours; term paper or project, one to three hours. Prerequisite(s): upper-division standing; consent of instructor and the Film and Visual Culture Chair. Individual study, directed by a faculty member, to meet special curricular needs. A final paper or creative project is required. Course is repeatable to a maximum of 12 units.

FVC 198-I. Individual Internship in Film and Visual Culture. (1-4) Consultation, one hour; internship, two to eight hours; individual study, one to three hours; term paper, one to three 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. A final paper or a creative project is required. Course is repeatable to a maximum of 12 units.

GENETICS

Subject abbreviation: GEN

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Bai-Lian Li, Ph.D. (Botany and Plant Sciences)
A.L.N. Rao, Ph.D. (Plant Pathology)
Frances M. Sladek, Ph.D.
(Cell Biology and Neurosciences)
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Assistant Professors
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Cheryl Hayashi, Ph.D. (Biology)
Isogoshi Kaloshian, Ph.D. (Nematology)
Paul B. Larsen, Ph.D. (Biochemistry)
Xuan Liu, Ph.D. (Biochemistry)
Stefano Lonardi, Ph.D. (Computer Science)
Ernest Martinez, Ph.D. (Biochemistry)
Dmitri A. Maslov, Ph.D. (Biology)
Constance J. Nugent, Ph.D. (Cell Biology and Neuroscience)
Patricia S. Springer, Ph.D.
(Botany and Plant Sciences)
Zhenbiao Yang, Ph.D. (Botany and Plant Sciences)

The Genetics Graduate Group (GGG) is an interdepartmental program that includes faculty from the departments of Biochemistry, Biology, Botany and Plant Sciences, Cell Biology and Neurosciences, Computer Sciences, Entomology, Nematology, Plant Pathology, and Statistics, as well as the Division of Biomedical Sciences. The GGG administers a program leading to the Ph.D. in Genetics. Three fields of specialization (subdisciplines) offered by the program are molecular/cellular genetics, evolutionary/population genetics, and genomics/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.

All students choose a genetics subdiscipline for specialization (either molecular/cellular, evolutionary/population, or genomics/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).

Genetics students are advanced to candidacy following successful completion of a written preliminary examination and an oral qualifying examination. Successful completion of a final oral dissertation defense is also required. There is no foreign language requirement. Each student is required to 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

Genetics / 267

Graduate Courses

GGG administers a program leading to the Ph.D. in Genetics. Three fields of specialization (subdisciplines) offered by the program are molecular/cellular genetics, evolutionary/population genetics, and genomics/bioinformatics. Unique to this curriculum is the melding of microbial, animal, and plant genomics/bioinformatics within a single program. The curriculum was designed to interface with the molecular/cellular and evolutionary/population tracks.

Doctoral Degree
All students choose a genetics subdiscipline for specialization (either molecular/cellular, evolutionary/population, or genomics/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).

Students are advanced to candidacy following successful completion of a written preliminary examination and an oral qualifying examination. Successful completion of a final oral dissertation defense is also required. There is no foreign language requirement. Each student is required to 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

GG 240A. Advances in Bioinformatics and Genomics. (4) Lecture. Four hours. Prerequisite(s): BCH 110C or BIOL 107A; BIOL 102. Introduces current concepts and technologies in bioinformatics and genomics. Covers genome, functional genomics, and statistical bioinformatics. Sequence comparison and genome databases, and genetic mapping and single nucleotide polymorphisms and introduces biological data modeling.
HISPANIC STUDIES

Subject abbreviations: SPN and PORT

William W. Megenney, Ph.D., Chair
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Professors
William W. Megenney, Ph.D.
James A. Parr, Ph.D.
Marina Pianca, Ph.D.
Raymond L. Williams, Ph.D.

Professors Emeriti
Cándido Ayllón, Ph.D.
Philip O. Gericke, Ph.D.
Hugo Rodríguez-Alcalá, Ph.D., Jur.D.

Assistant Professors
John Ochoa, Ph.D.
Catharine E. Wall, Ph.D.

Lecturers
Mari Carmen Ballester, M.A.
Julio Monroy, M.A.
Martín Navarro, M.A.
Luis H. Paredes, Ph.D.
Teresa Toscano, Ph.D.
Mirta Vargas, Ph.D.

MAJOR

The Department of Hispanic Studies offers a B.A. degree in Spanish. A student may major in Spanish by specializing in one of two undergraduate areas offered by the department: the Literature Option or the Linguistics Option. 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 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.

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 comprehensive coverage of the literatures of Spain and Latin America from their origins through the contemporary period. The M.A. in Spanish is designed for students who hold the B.A. in Spanish, to broaden their knowledge of Hispanic literary traditions through advanced study and is designed primarily for students who intend to pursue the Ph.D. at UCR. As part of their study of Hispanic literary traditions, students are introduced to advanced concepts of literary theory and can take seminars in areas such as Hispanic linguistics, Brazilian literature, and the theory and practice of creative writing. In addition to these Ph.D. students, a select number of students pursue the M.A. to improve their training as teachers in high schools or community colleges.

Applicants for admission normally have a B.A. in Spanish that includes at least five courses in Spanish and Latin American literature. 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.

Education Abroad Program

The Department of Hispanic Studies encourages eligible students to participate in the Education Abroad Program (EAP). 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. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uopeap.ucsc.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

GRADUATE PROGRAM

The graduate program in Spanish is designed to prepare scholars for teaching and research in Spanish and Latin American literatures. As such, 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.

All domestic applicants to the graduate programs must supply GRE scores for the verbal, analytical, and quantitative tests.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

The major requirements for the B.A. degree in Spanish are as follows:

Option Requirements — Choose one option

Literature Option

Upper-division requirements (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. Eight (8) units from SPN 120A, SPN 120B, SPN 120C
4. Twelve (12) units from the following survey courses: SPN 180A, SPN 180B, SPN 181A, SPN 181B
5. Eight (8) additional units of Spanish or Latin American literature
6. Four (4) units to be chosen from SPN 102A or SPN 102B

Linguistics Option

Upper-division requirements (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 (4) units from SPN 120A, SPN 120B, SPN 120C
5. Four (4) units from SPN 102A, SPN 102B
6. Twelve (12) units of upper-division electives in Spanish

Minor

Requirements for the minor in Spanish are as follows:

1. SPN 101A and SPN 101B or SPN 109A and SPN 109B
2. SPN 102A or SPN 102B
3. SPN 110
4. Eight (8) units from SPN 120A, SPN 120B, SPN 120C, SPN 105, SPN 106A

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

Portuguese

The Department of Hispanic Studies offers Portuguese language classes according to student demand and the availability of the faculty.

GRADUATE PROGRAM

The Department of Hispanic Studies offers comprehensive coverage of the literatures of Spain and Latin America from their origins through the contemporary period. The M.A. in Spanish is designed for students who hold the B.A. in Spanish, to broaden their knowledge of Hispanic literary traditions through advanced study and is designed primarily for students who intend to pursue the Ph.D. at UCR. As part of their study of Hispanic literary traditions, students are introduced to advanced concepts of literary theory and can take seminars in areas such as Hispanic linguistics, Brazilian literature, and the theory and practice of creative writing. In addition to these Ph.D. students, a select number of students pursue the M.A. to improve their training as teachers in high schools or community colleges.

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 comprehensive coverage of the literatures of Spain and Latin America from their origins through the contemporary period. The M.A. in Spanish is designed for students who hold the B.A. in Spanish, to broaden their knowledge of Hispanic literary traditions through advanced study and is designed primarily for students who intend to pursue the Ph.D. at UCR. As part of their study of Hispanic literary traditions, students are introduced to advanced concepts of literary theory and can take seminars in areas such as Hispanic linguistics, Brazilian literature, and the theory and practice of creative writing. In addition to these Ph.D. students, a select number of students pursue the M.A. to improve their training as teachers in high schools or community colleges.

Applicants for admission normally have a B.A. in Spanish that includes at least five courses in Spanish and Latin American literature. 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 are required to take a teaching methods course during their first quarter of assuming their duties as teaching assistants).

**Course Work** Candidates for the M.A. complete a minimum of 48 graduate units in literature or linguistics, with at least five graduate courses in Spanish Peninsular literature and at least five courses in Latin American literature. (In addition to Spanish and Latin American literature, students may fulfill their 48-unit requirement by taking courses in Linguistics or Comparative Literature.)

**M.A. Examination** Near the end of this two-year program (at the end of the fifth quarter and beginning of the sixth quarter), 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. 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 candidates to assume academic positions as scholars and teachers. Departmental strengths for this training lie in the literature of the twelfth century in Latin America, the twentieth century in Spain, and the Spanish Golden Age. Faculty also offers courses in literary theory, Latin American cultural studies, and the theory and practice of creative writing.

**Admission** Students admitted with the M.A. from other institutions are required to 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.

**Qualifying Examinations** Students choose two areas of concentration as examination areas. One area of Spanish Peninsular literature and one area of Latin American literature must be chosen from among the five areas of concentration:

1. Spanish Golden Age
2. Spanish eighteenth and nineteenth centuries
3. Spanish twentieth century
4. Latin American Colonial to nineteenth century
5. Latin American twentieth century

The area of specialization is defined by the long paper and dissertation topic. The doctoral examination consists of a four-hour written examination (two hours in each area of concentration), followed by an oral examination of approximately two hours. The oral examination deals with the two areas of concentration 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 are required to 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.)
SPN 105. The Phonology of the Spanish Language. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): LNG 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, three hours; extra reading, three hours. Prerequisite(s): the SPN 101A and SPN 101B sequence or the SPN 109A and SPN 109B sequence. 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, three hours; extra reading, three hours. Prerequisite(s): SPN 106A. An introduction to descriptive and applied techniques in the morphophonetics of the Spanish language as found in Spain and Spanish America.

SPN 109A. Spanish for the Native Speaker. (4) Lecture, three hours; individual study, three 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, three hours; individual study, three 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, three hours; extra reading, three 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, three hours; extra reading, three 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. E. 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. Masterpieces of Hispanic Literature: Modern Spain and Latin America. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SPN 110. Reading and analysis of short texts of modern authors from Spain and Latin America.

SPN 120B. Masterpieces of Hispanic Literature: Spain. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SPN 110. The study of major works from Spain.

SPN 120C. Masterpieces of Hispanic Literature: Latin America. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SPN 110. Reading and analysis of major texts of authors from Latin America.

SPN 121 (E-Z), Hispanic Thought: Major Essayists. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SPN 110. A study of major essayists, with emphasis on the modern period. E. Three Twentieth-Century Latin American Essayists.

SPN 140 (E-Z). Renaissance and Baroque Literature. (4) Lecture, three hours; individual study, three 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 Picara; T. Spanish Theatre of the Golden Age.

SPN 141. Cervantes. (4) Lecture, three hours; extra reading, three 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 Quijote.

SPN 142. Continuities of the Spanish Golden Age in Modern Latin America. (4) Lecture, three hours; extra reading, three 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 143. Hispanic Literature in New York City. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): SPN 110. Survey of prose, poetry, drama, fiction, film, and visual arts on the Hispanic experience in New York City. Includes writers such as Ingrid Mattson, Mario Vargas Llosa, Cardenal, Spain (Jiménez, Lorca, Ayalá), and the United States (Pietri, Santiago, Alvarez). Taught in Spanish.

SPN 150 (E-Z). Studies in Eighteenth- and Nineteenth-Century Literature. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): SPN 110. A concentrated study of a genre, movement, author, or outstanding work of this period. Topics vary each time course is offered. E. The Spanish Essay; F. Naturalism in Spanish Prose; G. Nineteenth-Century Literature.

SPN 155. The Generation of 1898. (4) Lecture, three hours; individual study, three 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, Vallecillo, Antonio Machado, Azorín, and Benavente.


SPN 163. Spanish Poetry of the Twentieth Century. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SPN 110. A study of the major poets of the twentieth century, from the Generation of 1898 to the post-war period. All reading and writing is in Spanish.


SPN 171. Reel to Real: Latin American Film and Social Change. (4) Seminar, three hours; individual study, one hour; screening, one and a half hours; term paper, half hour. Prerequisite(s): SPN 110. Introduces Latin American film as it articulates with contemporary history and current events. Cross-listed with FVC 171.

SPN 180A. Survey of Spanish Literature, Middle Ages-1699. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SPN 110; concurrent or previous enrollment in SPN 120A or SPN 120B. Survey of literary movements and trends and major Spanish American writers of the colonial period and the nineteenth century. Readings in fiction, poetry, drama, and essay. Covers writers such as Sor Juana Inés de la Cruz, Cheever, Sarmiento, Martí, and Darío.

SPN 181A. Survey of Spanish American Literature, 1492-1899. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): SPN 110; concurrent or previous enrollment in SPN 120A or SPN 120B. Survey of literary movements and trends and major Spanish American writers of the twenty-first century. Readings in fiction, poetry, drama, and essay. Covers writers such as Martí, Vallejo, Huidobro, García Márquez, Fuentes, Paz, Buenaventura, and Elena Poniatowska.

SPN 188 (E-Z). Interdisciplinary Studies: Latin America. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): SPN 110. Reading, research, and discussion on particular Latin American problems that lend themselves to interdisciplinary analysis.

SPN 190. Special Studies. (1-5) Individual study, three to fifteen 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, six 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 Unsatisfactory (U). Course is repeatable to a maximum of 6 units.

SPN 199H. Senior Honors Research. (1-5) Course is repeatable.

CURRICULUM AND COURSES

SPN 203. Problems in Spanish Linguistics. (4) Lecture, three hours; outside research, three 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, three hours; individual study, three 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, three hours; extra reading, three hours. Prerequisite(s): graduate standing. Presentation and discussion of semantics, speech acts, and speech genres, and discourse analysis 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 209. Ethnolinguistic Analysis of Afro-Latin American Culture. (4) Lecture, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): graduate standing. A historical and analytical study of the Atlantic slave trade. Examines the formation of creole languages in Latin America and their impact on contemporary Latin American languages and culture.

SPN 220. Criticism and Critical Documentation. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): graduate standing. Strategies of reading and analysis from formalism and new criticism through structuralism, deconstruction, and new historicism, with attention to Anglo-American contributions and the humanistic heritage; practice in MLA documentation. Required for the Ph.D.

SPN 251. Seminar in the Literature of the Middle Ages and Early Renaissance. (4) Seminar, three hours; consultation, one 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 253. Seminar in Spanish Linguistics. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing; SPN 207. An in-depth study of the synchronic or diachronic aspects of a language. Special study of Spanish linguistics which has developed in areas such as phonology, morphology, syntax, semantics, and pragmatics. Course is repeatable to a maximum of 12 units.

SPN 257. Seminar in Hispanic Civilization. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing; the appropriate course from LNST 118A or LNST 118B. 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, three hours; individual study, three 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; T. The Satiric Tradition in Hispanic Letters.

SPN 261 (E-Z). Studies in Golden Age Literature. (4) Seminar, three hours; consultation, one 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, three hours; outside research, three 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, three hours; consultation, one 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) F Seminar, three hours; consultation, one hour. Prerequisite(s): graduate standing. Study of modern and contemporary Spanish literature 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; T. Theatre of the Postwar and Democratic Epoch (1940-2000).

SPN 270 (E-Z). Latin American Literature. (4) Seminar, three hours; consultation, one 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; Y. The Latin American Avant-Garde. Segments are repeatable.

SPN 272. Seminar in the Literature of a Specific Latin American Country. (4) Seminar, three hours; consultation, one 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 275. Seminar in Literary Criticism. (4) Seminar, three hours. Prerequisite(s): graduate standing.

SPN 276. The “Negative Sublime” in the Americas. (4) Seminar, three hours; extra reading, three hours. Prerequisite(s): graduate standing. Examines texts of paranoia, cognitive dissonance, and cultural anxiety within their specific North and South American contexts. Explores issues of personal and national identity and of family romance as well as the satiric genre in historical perspective. Includes relevant theory.

SPN 290. Directed Studies. (1-4) 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): graden 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. To be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SPN 292. Concise Literary Criticism (Repetition). (2) Research, six hours. Prerequisite(s): consent of instructor; director of the Ph.D. program. May be repeated with different topic. Either SPN 185 or the sequence SPN 101A and SPN 101B, SPN 106A and SPN 106B, and SPN 120A, SPN 120B, and 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.

SPN 301. Teaching Spanish at the College Level. (2) Seminar, two 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, four to eight hours; discussion, one hour. Prerequisite(s): ETLG 301 or equivalent; graduate standing; employment as Teaching Assistant or Associate. Supervised teaching in lower-division courses. Required of all teaching assistants in Spanish. Fullfills teaching portion of Ph.D. requirement. Graded Satisfactory (S) or No Credit (NC). May be repeated.

PORT 004. Intermediate Portuguese. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): consent of instructor. A continuation of the development of the basic skills of speaking, reading, and writing Brazilian Portuguese.

PORT 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.

PORT 101. Brazilian Literature. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): SPN 101A or equivalent. An introduction to Brazilian Portuguese grammar structured for those possessing knowledge of Spanish. Emphasis is on comparing and contrasting grammatical constructions. Examples are taken from Brazilian literature.

PORT 162 (E-Z). Survey in Brazilian Fiction. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PORT 004 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: Graciálima Ramos, Rego, Queiroz, Arredondo, Machado de Assis. 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.

SPN 220. Criticism and Critical Documentation. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): graduate standing; the appropriate course from LNST 118A or LNST 118B. 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, three hours; individual study, three 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; T. The Satiric Tradition in Hispanic Letters.

SPN 261 (E-Z). Studies in Golden Age Literature. (4) Seminar, three hours; consultation, one hour. 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, three hours; consultation, one 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) F Seminar, three hours; consultation, one hour. Prerequisite(s): graduate standing. Study of modern and contemporary Spanish literature 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; T. Theatre of the Postwar and Democratic Epoch (1940-2000).

SPN 270 (E-Z). Latin American Literature. (4) Seminar, three hours; consultation, one 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; Y. The Latin American Avant-Garde. Segments are repeatable.
teaching should be aware that the department’s program has been officially approved under the Ryan Act for both the elementary (multiple-subjects) and secondary (single-subject) credential programs, which exempts graduates from the statewide examinations required in these fields. 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.

**History/Administrative Studies Major**

The History/Administrative Studies major is designed to combine the discipline of History, with its emphasis on changes 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 History graduate program in Historic Resources Management, 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.

**Degree Requirements**

**University Requirements**

See the Undergraduate Studies section for requirements that all students must satisfy.

**College Requirements**

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

**Major Requirements**

The History Department offers B.A. degrees in History, History/Administrative Studies, and History/Law and Society.

**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 and Africa

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 student affairs officer for further details.

Each History major is urged to consult with the student affairs officer for quarterly advising and to meet with the Undergraduate Advisor at least one time each year. Appointments can be made through the student affairs officer.

**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

1. Lower-division requirements (17 units)
   a) BSAD 010, BSAD 020A
   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 102A or ECON 130 or ECON 162/BSAD 162
2. Requirements for Law and Society

1. Requirements for History (48 units):
The major requirements for the B.A. degree in 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, including a seminar (HIST 191 [E-Z]):
   - Ancient and Medieval Europe
   - Latin America
   - Asia and Africa
   - History of Science and Technology

Please note that the seminar HIST 191 (E-Z) is required and must be taken in the student's area of concentration.
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 student affairs officer for further details.

Graduate Division automatically processes all applications for the fall quarter. Under very rare circumstances, Admissions may grant exceptions to this deadline. See the Admissions process for details.

Education Abroad Program
The History Department encourages eligible students to participate in the Education Abroad Program (EAP). EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to plan study abroad 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 see the University of California's EAP Web site at www.uoeap.ucsb.edu or contact UCR's International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

History Computing Facility
The History Computing Facility offers graduate students and faculty a unique opportunity to conduct quantitative research. The facility's microcomputers and terminals are networked to the campus interactive computing system, and the department's Computer Resource Specialist is ready to assist in the preparation and design of research projects. Consequently, the facility is at the center of the UCR graduate program.

GRADUATE PROGRAM
Graduate Advisor
Department of History
University of California, Riverside
Riverside, CA 92521-0204
history@ucr.edu

Admissions
Applications for admission, due January 5, are normally for the fall quarter only, and the Graduate Division automatically processes all applications for the fall quarter. Under very

### Bibliographic Information

- **Title:** History / 273
- **Page:** 273
- **Section:** 2. Requirements for Law and Society
- **Subsection:** 1. Requirements for History (48 units)
- **Course Codes:**
  - SOC 150 or SOC 151 or SOC 171
  - PSYC 181 or PSYC 182 or PSYC 183
  - ANTH 127 or ANTH 131
- **Note:** In filing 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).

### Additional Details

- **Contact:** history@ucr.edu
- **Address:** University of California, Riverside
- **Phone:** (909) 787-4113
special circumstances, exceptions may be made for admission in other quarters, after consultation with the graduate advisor. Applications received after January 5 are considered on May 1 on a space-available basis. Only fully completed applications receive attention. Scores for the aptitude sections of the GRE are required of all applicants. If the GRE is taken later than December, admissions decisions may be delayed. Applicants must submit a writing sample. Students taking the regular M.A. examinations or the Program in Historic Resources Management oral examinations may at that time request to be considered for admission to the doctoral program. They are rated as recommended, acceptable, or not recommended.

Students entering the master’s degree program choose a faculty advisor from the department faculty within two quarters of commencing their studies. Students entering directly into the Ph.D. program choose a faculty advisor immediately upon entering the program. Students may change faculty advisors as they continue their studies, with the approval of the graduate advisor. The graduate advisor works closely with each student’s faculty advisor in approving the student’s course of study.

Master’s Degree
The Department of History offers two programs of study leading to the master’s degree: The Regular Program and the Program in Historic Resources Management. The requirements for admission and courses of study are different for the two programs.

Regular Program (M.A.)
The primary purpose of the M.A. degree at UCR is to prepare the student for research as a professional historian and to further study towards the Ph.D. Students taking the M.A. degree receive training for careers in teaching or other areas such as government service or journalism.

A candidate for the master’s degree in the Regular Program must complete a minimum of 40 units of required course work beyond the baccalaureate. This must include

1. At least 12 units of graduate courses related to the candidate’s area of specialization (see list below)

2. Four (4) units from the following:
   - HIST 210 (Introduction to Economic History)
   - HIST 236 (Quantitative Methods for Historians)
   - HIST 238A (Oral History Methods and Theory)
   - HIST 250 (New Directions in Historical Research)
   - HIST 254 (Theory and Methods in History)

3. At least 16 units in courses in two general areas of M.A. specialization listed below that are not in the candidate’s area of specialization. One area also may be chosen from any Ph.D. field listed below that is outside the candidate’s area of specialization. Eight (8) of the units must be at the graduate level. HIST 290 may be used to fulfill this requirement only with permission of the graduate advisor.

4. At least one two-quarter graduate research seminar in the candidate’s area of specialization

Language Requirement
The candidate is required to demonstrate an ability to read one foreign language. Satisfying the foreign language requirement is a prerequisite for taking the comprehensive oral examination. The requirement can be fulfilled by showing basic proficiency in a departmental examination or by passing a designated language course.

Students who fail the examination in their chosen language four times and fail to pass the designated courses may not advance any further.

Qualifying Examination
M.A. students are expected to take the department qualifying examinations in their field of specialization no later than spring quarter of their second year. The department qualifying examinations are based on course work and reading lists associated with each of the four areas of specialty. Department qualifying examinations are offered in all fields in the fall and spring quarters only.

Students receiving a grade of high pass on the qualifying examinations are allowed to enter directly into the Ph.D. program without having to complete the master’s degree. Students who move directly into the Ph.D. program may obtain an M.A. degree by completing the requirements for the M.A.

Students receiving a grade of pass on the department qualifying examinations are allowed to proceed with work towards a master’s degree. Upon completion of their M.A. comprehensive oral examination, students may be admitted into the Ph.D. program upon the recommendation of their oral examination committee and approval by the graduate study committee.

Students who fail the department qualifying examination are allowed to retake the examination; however, they must do so the next time the examinations are offered. Two failures on the department qualifying examination preclude a student from continuing in the graduate program.

Oral Examination
Candidates must pass a comprehensive oral examination in their area of specialization to receive the M.A. degree. The candidate must present a substantive research paper for consideration by the examining committee. The research paper is normally developed from work in a research seminar in the candidate’s major field of interest. The examining committee is chaired by the student’s faculty advisor and includes at least one other faculty member chosen by the candidate and approved by the graduate study committee. The oral examination committee makes a recommendation to the graduate study committee as to whether the candidate should be allowed to enter the Ph.D. program. The graduate study committee makes the final determination whether the student is allowed to proceed to the Ph.D. program.

The comprehensive oral examination is normally completed within three quarters following the department qualifying examinations. Students who fail the comprehensive oral examination are allowed to retake the examination only once. They are expected to do so within two quarters following the term of their first attempt at the comprehensive oral examination.

Specialization
The department offers four general areas of specialization: United States, Native American History, European History, and Latin America. Within the United States and European areas of specialization are several subspecialties. Detailed course options for each area are available from the department.

1. United States
   - Students specializing in the United States must complete HIST 201A, HIST 201B, and HIST 201C. They are also encouraged to take HIST 230. Candidates in United States history may select their advanced work from the following fields and related seminars:
     - HIST 272A and HIST 272B (Seminar in American Colonial and Early National History)
     - HIST 274A and HIST 274B (Seminar in Nineteenth-Century United States History)
     - HIST 275A and HIST 275B (Seminar in Twentieth-Century United States History)

2. Native American History
   - The M.A. in Native American History prepares students to continue toward a Ph.D. in Native American History and for community-based research with Native American nations.
   - Students specializing in Native American History must complete 16 units of graduate courses in the field, with at least 12 units from HIST 205A, HIST 205B, HIST 205C, and HIST 237. The remaining units should be taken from HIST 210A, HIST 210B, HIST 210C, HIST 206A, HIST 206B, or HIST 230. Students must also complete HIST 276A and HIST 276B, the seminar in Native American history.

3. European History
   - The M.A. in European History has two tracks: Early Modern European History and Modern European History. The M.A. program prepares students to continue towards a Ph.D. in European, British, and Russian History.
   - Students specializing in European History must complete HIST 200, take an additional 12 units of graduate courses for their track as specified below, and complete a two-quarter seminar in European history.

Early Modern European History
12 units of European history graduate courses, of which at least 8 units are from HIST 202C, HIST 202D, or HIST 205A. For
their seminar requirement, students may take HIST 251A and HIST 251B or HIST 253A and HIST 253B or HIST 256A and HIST 256B.

Modern European History 12 units of European history graduate courses, of which at least 8 units are from HIST 202E, HIST 202F, HIST 202G, HIST 204, HIST 205B, HIST 208, HIST 209A or HIST 209B. For their seminar requirement, students may take HIST 251A and HIST 251B or HIST 255A and HIST 255B or HIST 256A and HIST 256B or HIST 258A and HIST 258B.

Latin America Students specializing in Latin America must take at least 12 units of graduate courses related to their specialty, including HIST 206A and HIST 206B. They must also take HIST 285A and HIST 285B, the seminar in Latin American history.

Normative Time to Degree 6 quarters

Program in Historic Resources Management (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. Applicants for admission to the program normally must have the B.A. in History. The program accepts applicants having the B.A. in Anthropology, Art History, Political Science, or Sociology, provided that these applicants can demonstrate a satisfactory knowledge of history.

Students prepare in three areas:
1. An 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 taken outside the department related to the professional specialty

A candidate for the master’s degree in this program must complete a minimum of 36 units of graduate and upper-division undergraduate units as follows:
1. One graduate history two-quarter research seminar
2. Two courses from any History courses numbered 200-250
3. One course from HIST 260, HIST 262, HIST 263, chosen according to the student’s subspecialty (The accompanying practicum must also be taken if offered.)
4. Two upper-division undergraduate or graduate courses outside the department in subjects related to the subspecialty (from a list prepared by the program committee or with the graduate advisor’s approval)
5. Two additional upper-division undergraduate or graduate courses either in History or in another department in subjects relating to the subspecialty, chosen in consultation with the graduate advisor
All students must take HIST 398-I and HIST 402, which do not count in fulfilling the 36-unit requirement, followed by HIST 290.

Internship The candidate is required to take 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. Internships are regularly offered at the Riverside Municipal Museum; the Riverside County Department of Parks — Office of the Historical Specialist; the San Bernardino County Museum; Colonial Williamsburg; and the Smithsonian Institute. The internship is registered with a History Department faculty advisor as HIST 398-I.

The internship requires writing a field report. When the candidate’s advisor and the Historic Resources Management Committee 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 The candidate must pass an oral examination comprised of two parts, one part on the field-report-in-progress and a second part on the relevant elements of the candidate’s field of history and the content of the subspecialty.

The committee on Historic Resources Management oversees the program in Historic Resources Management for the M.A. and coordinates program activities and departmental relations with historical societies, preservation groups, local government organizations, museums, and archives.

Students in the Historic Resources Management Program who wish to continue for the doctorate at UCR are eligible for the Ph.D. program on a case-by-case basis.

Doctoral Degree

The M.A. degree in History is not a prerequisite for admission to the doctoral program. Students not holding an M.A. degree in History and passing the department qualifying examination with a grade of high pass in one area of specialization are admitted to the Ph.D. program. Students with an advanced degree in a field closely related to History and involving significant study of history, such as American Studies, Latin American Studies, or Russian Studies, are reviewed by the graduate study committee on a case-by-case basis to determine if the student should be exempted from taking the department qualifying examination and be admitted directly into the Ph.D. program. Students with only a B.A. degree enter the M.A. program, even if their ultimate degree objective is the Ph.D.

Students in the Ph.D. program must prepare in three fields: a research field, a complementary field, and a teaching field. The research field must be chosen from the list of research fields below. The complementary and teaching fields shall be chosen from either the research fields or the additional fields below. Students are examined in the research and complementary fields by both written and oral examinations. Students prepare for the teaching field by completing at least 12 hours of relevant courses, with at least 8 hours at the graduate level, including at least one relevant Materials course from the sequence HIST 201-209. HIST 290 may be used towards this requirement only with permission of the graduate advisor.

In special cases, the student 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 examinations in that field. Students may not take three fields that deal exclusively with the same country or region.

Students normally take their Ph.D. qualifying examinations and complete their teaching field course work no later than the seventh quarter following admission into the Ph.D. program.

Students must complete the materials courses in their research and complementary fields, before attempting the examinations. Students preparing a complementary field in Public History must complete HIST 402. Written examinations are offered in fall, winter, and spring quarters. A student may take written examinations separately in their research and complementary fields and may schedule the oral examination immediately after successfully completing their written examinations and their teaching field courses.

The committee for the oral examination, chaired by the student’s faculty advisor, shall consist of five faculty members, or six where appropriate, nominated by the department and appointed by the graduate dean.

Research Fields:
Early America, 1607–1800
Nineteenth-Century United States, 1800–1896
Twentieth-Century United States, 1896–present
Native American History
Early Modern Europe
Europe, 1789–present
England, 1485–1832
England, 1714–present
Russia, 1801–present
Latin America, 1492–1810
Latin America, 1810–present
Public History

Additional Fields:
Comparative World History
Early Modern World History
Greek and Roman History
Social Science History
Women in Culture and Society
Language Requirement  Every student in the doctoral program must demonstrate a proficiency in at least one foreign language equivalent to that required for the M.A. degree. Requirements successfully passed in a particular language while in the M.A. program may be counted towards meeting some requirements in the doctoral program. Specific additional language requirements for the doctoral program will depend on the students' research fields; students may be asked to show research proficiency in a language for the Ph.D., even if they showed basic proficiency in that language for the M.A. Consult the Department of History for the language requirements in each research field.

Candidates must pass all foreign language requirements before taking their Ph.D. research field written examinations, but the candidates may take the Ph.D. complementary field written examinations before completing their foreign language requirements. They may take the departmental examination in any one language not more than four times. Continued failure to make progress in required foreign language(s) may be cause for termination from the program. Some seminars involve the use of a foreign language.

Course Work  Doctoral students should normally take at least two, two-quarter research seminars on the UCR campus, at least one of which must be taken after the M.A. has been granted or the student has successfully passed the department qualifying examination. If they have taken an M.A. seminar in this department or if they have written an M.A. thesis in a field of specialization, that is normally accepted for one of the two required seminars. Doctoral students must complete eight hours of courses on historical theory and methods. Four of these hours must be chosen from the following:

HIST 210 (Introduction to Economic History)  HIST 236 (Quantitative Methods for Historians)  HIST 238A (Oral History Methods and Theory)  HIST 250 (New Directions in Historical Research)  HIST 254 (Theory and Methods in History)

The additional four hours may also be chosen from these courses, or may consist of a course outside the department that is approved by the graduate advisor.

Dissertation and Final Oral Examination  The student must submit to the graduate study committee a dissertation proposal approved by the student's faculty advisor, who is the chair of the dissertation committee, by the end of the next academic quarter after the student has been advanced to candidacy. See departmental guidelines for proposal requirements.

The candidate must submit an acceptable dissertation and pass a final oral examination. The dissertation, which must demonstrate scholarly, original, and independent investigation, is on a subject the student has chosen from the research field with the advice and approval of the dissertation committee. The final oral examination deals primarily with the relation of the dissertation to the general field in which it lies.

Normative Time to Degree including M.A. Work 17 quarters

HISTORY

LOWER-DIVISION COURSES

The History Department offers these lower-division courses for the benefit of the entire campus and not specifically for History majors. HIST 010, 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, three hours; discussion, one hour. HIST 001 is designed to acquaint students with several approaches to the methods and processes historians use to reach conclusions about the past. Students will have the opportunity to work creatively with historical materials and become the historian as detective. These methods will be introduced with varying seminars through the Schedule of Classes. May be repeated for credit.

HIST 004. Introduction to Chicano History. (4) Lecture, three hours; extra reading, three 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, three hours; discussion, one 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, three hours; discussion, one 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 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, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to HIST 015. A comparative study of the unique characteristic 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 017A. Introduction to United States History. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. An introduction to the major themes and issues in the history of the United States from colonization to the middle of the nineteenth century.

HIST 017B. Introduction to United States History. (4) Lecture, three hours; discussion, one 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, three hours; discussion, one 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, three hours; discussion, one 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, three hours; consultation, one 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 world.

HIST 025. The Ancient Mediterranean. (4) Lecture, three hours; consultation, one 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, Babylon, 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, three hours; consultation, one 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, three hours; extra reading, three 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—the 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, three hours; consultation, one 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.

HIST 033. Witchcraft in Colonial America. (4) Lecture; three hours; discussion, one 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; three hours; discussion, one hour. Prerequisite(s): none. Introduces Native American 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 Native American perspectives of historical issues and events.


HIST 037. History of North American Indians, 1900-Present. (4) Lecture; three hours; discussion, one 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; three hours, individual study, three 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 twenty century. Videos and slides used to illustrate important themes and concepts.

HIST 044. Gods, Ghosts, and Grandparents. (4) Lecture; three hours; discussion, one 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 funerary rituals. Cross-listed with HIST 044.

HIST 045 (E-Z). Topics in Asian History. (4) Lecture; three hours; consultation, one hour. Prerequisite(s): none. An introduction to regional histories and cultures of Asia. E. East Asia; F. East and Southeast Asia; G. India in the Western Imagination. Cross-listed with Asian Studies 045 (E-Z).

HIST 051. Europe from Plague to Revolution, 1400-1750. (4) Lecture; three hours; discussion, one hour. 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 historical experience of individuals, including commoners and elites.

HIST 052. Europe from the Enlightenment to 1968. (4) Lecture; three hours; discussion, one 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. Examines the emergence of a large middle class, the transformation of women's roles, and changing perceptions of the outside world.

HIST 060. Years of Protest: America, 1960-1975. (4) Lecture; three hours; consultation, one 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; three hours; extra reading, three hours. Prerequisite(s): EIST 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 revolutions he taught and espoused. Cross-listed with EIST 061.

HIST 075. Introduction to Latin America. (4) Lecture; three hours; consultation, one 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, revolutions he taught and espoused. Cross-listed with EIST 061.

HIST 102. Oral History. (4) Seminar; three hours; field, three hours. Prerequisite(s): upper-division standing or consent of instructor. Theory and practice of oral history as a research technique, including research preparation, interview procedures, editing, transcription, and legal responsibilities. Class based around a major project, with students choosing individual related to topics. Limited enrollment.

HIST 103. History of Science from Antiquity to Copernicus. (4) Lecture; three hours; outside research, two terms; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. An introduction to the study of 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; three hours; on-line discussion, one 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, mathematics, and religion, with secondary attention to the historical sociology of science.

HIST 105. Science in the Modern World. (4) Lecture; three hours; on-line discussion, one 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 worldview, the genetic revolution and its social consequences, and the romantic rejection of science.

HIST 106. Science in Triumph and Crisis. (4) Lecture; three hours; on-line discussion, one 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 108. Technology in Premodern Civilizations. (4) Lecture; three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the origins and history of ancient technology from Mesopotamia to the Greek-Roman world. Topics include the problems of the calendar and planetary motions and the relation between astronomy and astrology in the ancient world. Focuses on readings from primary texts.

HIST 110. History of Ancient Astronomy. (4) Lecture; three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Explores the origins and history of ancient astronomy from Mesopotamia to the Greek-Roman world. Topics include the problems of the calendar and planetary motions and the relation between astronomy and astrology in the ancient world. Focuses on readings from primary texts.
Dynasty (early tenth century, C.E.) with emphasis on social, economic, and political history.

**HIST 181. Late Traditional China.** (4) Lecture, three hours; term paper, three 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, three hours; term paper, three 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 189. Modern Jewish History.** (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of Jewish history in Europe and America since the emancipation of the Jews during the French Revolution. Topics include assimilation, the rise of anti-Semitism, the Jews and socialism and cultural modernism, Jewish life in Europe and America, emigration, the Holocaust, Zionism, and the establishment of Israel.

**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, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of Jewish 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.

**GRADUATE COURSES**

**Consent of the instructor is required for enrollment in all graduate courses.**

**HIST 200. General Colloquium in European History.** (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Offers the opportunity for directed research at an honors level. Satisfactory (S) or No Credit (NC) grading is not available.

**HIST 201A. Materials for American History: Colonial North America.** (4) Lecture and discussion, three hours. Colonial North American history as seen through primary and secondary literature. Covers all three major geographical areas, although emphasis may vary. Course is repeatable to a maximum of 8 units.

**HIST 201B. Materials for American History: United States, 1789-1877.** (4) Lecture and discussion, three hours. American history from 1789 to 1877 as seen through primary and secondary literature.

**HIST 201C. Materials for American History: United States, 1877 to the Present.** (4) Lecture and discussion, three hours. Modern American history from 1877 to the present as seen through primary and secondary literature.

**HIST 202A. Materials for European History: Early Modern Europe (1400-1648).** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers early modern European history (1400-1648) as seen through primary and secondary literature.

**HIST 202B. Materials for European History: Ancien Régime (1648-1789).** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers Ancien Régime (1648-1789) as seen through primary and secondary literature.

**HIST 202C. Materials for European History: Nineteenth Century (1789-1890).** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers nineteenth-century European history (1789-1890) as seen through primary and secondary literature.

**HIST 202D. Materials for European History: Early Twentieth Century (1890-1945).** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers early twentieth-century European history (1890-1945) as seen through primary and secondary literature.

**HIST 202G. Materials for European History: Late Twentieth Century (1945-1989).** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers late twentieth-century European history (1945-1989) as seen through primary and secondary literature.

**HIST 203A. Materials for Native American History: Early America.** (4-5) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to the central historical problems, historiographical debates, and theoretical approaches to the study of Native American history in the fifteenth through the eighteenth centuries.

**HIST 203B. Materials for Native American History: Nineteenth Century.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to the central historical problems, historiographical debates, and theoretical approaches to the study of Native American history in the nineteenth century.

**HIST 203C. Materials for Native American History: Twentieth Century.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Introduces students to the central historical problems, historiographical debates, and theoretical approaches to the study of Native American history in the twentieth century.

**HIST 204. Materials for Modern French and Latin American History.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Basic readings in secondary literature on the history of modern France since the Revolution of 1789 with selected themes on Italy and Spain.

**HIST 205A. Materials for English History: 1485-1603.** (4) Lecture, three hours; outside research, three hours. Prerequisite(s): consent of instructor. An examination of some of the major primary materials for English history and an assessment of important secondary accounts.

**HIST 205B. Materials for English History: 1760 to the Present.** (4) Lecture, three hours; outside research, three hours. Prerequisite(s): consent of instructor. An examination of some of the major primary materials for English history and an assessment of important secondary accounts.

**HIST 206A. Materials for Latin American History: Colonial Period to 1820.** (4) Lecture, three hours. Colonial Latin American history as seen through primary and secondary literature.

**HIST 206B. Materials for Latin American History: 1820 to the Present.** (4) Lecture, three hours. Latin American history from 1820 to the present as seen through primary and secondary literature.

**HIST 207. Materials for the Early Modern World.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. An exploration of the major concepts, categories, methodological approaches, and historiographical issues in recent scholarship on the early modern world (circa 1400-1750), focusing on international and interdisciplinary analysis.

**HIST 208. Materials for Modern German History.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Readings of selected important monographs in German history from 1815 to the present.

**HIST 209A. Materials for Modern Russia: 1801 to 1917.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): graduate standing or consent of instructor. An examination of the historiography of Russian history. Topics include social developments, cultural and religious history, peasants, industrialization, revolutionary movements, Bolshevism, ideology, and the Russian Civil War.

**HIST 209B. Materials for Modern Russia: Soviet History.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): graduate standing or consent of instructor. An examination of the historiography on Russian history. Topics include social developments, cultural and religious history, Stalinism, World War II, and the post-Stalin period.

**HIST 210. Introduction to Economic History.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): graduate standing. Analysis of selected problems on economic history with an emphasis on methodological approaches to those issues.
HIST 212 (E-Z). Topics in the History of Science. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines major historical themes and works in the history of science from the ancients to the present, emphasizing the historical sociology of science, the social construction of scientific paradigms, and relations between science and other intellectual traditions that seek to explain nature: E. Comparative Themes.

HIST 215 (E-Z). Topics in American History. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing. Analysis of selected specific topics in American history. E. Slave Folliore and the Historical Process; F. Culture and Politics in Twentieth-Century United States; G. Transnational Migrations; H. Populism, the Progressive Movement, and the New Deal; J. The World of Little Women.

HIST 217 (E-Z). Topics in Asian History. (4) Lecture, three hours; outside research, three 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 PRC.

HIST 218. Africa in the Era of the Transatlantic Slave Trade. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines the political economies and the social and cultural histories of Atlantic Africa between 1550 and 1800 within the broader 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, three hours; research, three hours. Prerequisite(s): graduate standing or consent of instructor. Focuses on the multiple methodologies 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, three hours; outside research, three 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 pre-existing institutions. Topics include political, social, religious, and intellectual developments.

HIST 222. Approaches to Late Antiquity. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. An introduction to the central texts of the field of late antiquity.


HIST 229. The American Other: Apparitions and Appropriations. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing. Cultural studies of the uneasy in American history in relation to race, gender, and colonialism.

HIST 230. The American Frontier: Ideas and Interpretations. (4) Lecture, three hours; consultation and extra reading, three hours. Prerequisite(s): HISA 157. The broad themes and historical interpretations regarding the frontier as a factor in the American character and in American institutions.

HIST 236. Quantitative Methods for Historians. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to quantitative methods of research. Emphasis is on practical applications. Topics include quantitative research design, coding, and data management; the problems of quantitative historical data; and common statistical methods and analytical techniques.

HIST 237. Theory and the Study of Native American History. (4) Seminar, three hours; extra reading, three 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 asays 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, three hours; individual study, three 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 240 (E-Z). Documentary Source Study. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): graduate standing or consent of instructor. Introduction to the scholarly handling of images, whether ancient or modern, including inscriptions, manuscripts, and archival documents. Instruction in the methodologies, tools, sources, and the editing and use of texts in history. Analysis of archival structure and organization and of questions of document authorship, provenance, paleography, language and syntax, internal structure, and variant texts. E. Russian. Each segment is repeatable to a maximum of 12 units.

HIST 250. New Directions in Historical Research. (4) Seminar, three hours; extra reading, three hours. Prerequisite(s): graduate standing or consent of instructor. 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 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 252A. Seminar in Renaissance and Reformation History. (4) Seminar, three hours; outside research, three 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 asays the potential contributions to Native American history of theoretical approaches developed in other fields of concentration. 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 255A. Seminar in Modern Russia. (4) Seminar, three hours; extra reading, three hours. Prerequisite(s): graduate standing or consent of instructor. 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 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.
repeat the sequence once for credit; total credit for each course may not exceed 8 units.

HIST 256B. Seminar in English History. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing; HISE 151, HISE 152, or equivalents; HIST 250A. 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, three hours. Course is repeatable to a maximum of 8 units.

HIST 258B. Seminar in Modern European History. (4) Seminar, three hours. Course is repeatable to a maximum of 8 units.

HIST 260. Historic Preservation. (4) Seminar, three hours; conference, one 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, six hours. Prerequisite(s): HIST 250A and HIST 250B. 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, three hours; laboratory, two 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, three hours; consultation, one hour. Prerequisite(s): graduate standing or consent of instructor. Credit not applicable to graduate units. For students authorized by the department; open to terminal M.A. students with consent of instructor. Credit not applicable to graduate unit requirement. Fulfills teaching portion of Ph.D. teaching requirement. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

HIST 260L. Preservation Conservation Practicum. (2) Research, six hours. Prerequisite(s): HIST 250A and HIST 250B. 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, three hours; laboratory, two 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, three hours; consultation, one hour. Prerequisite(s): graduate standing or consent of instructor. Credit not applicable to graduate units. For students authorized by the department; open to terminal M.A. students with consent of instructor. Credit not applicable to graduate unit requirement. Fulfills teaching portion of Ph.D. teaching requirement. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

HIST 263. Archival Management. (4) Seminar, three hours; research, one 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, three hours. Prerequisite(s): HIST 263. Supervised research and administrative experience in an archive; intended to accompany HIST 263.

HIST 272A. Seminar in American Colonial and Early National History. (4) Seminar, three hours. Course is repeatable to a maximum of 8 units.

HIST 272B. Seminar in American Colonial and Early National History. (4) Seminar, three hours. Course is repeatable to a maximum of 8 units.

HIST 274A. Seminar in Nineteenth-Century United States History. (4) Seminar, three 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, three hours. Course is repeatable to a maximum of 8 units.

HIST 275A. Seminar in Twentieth-Century United States History. (4) Seminar, three 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, three hours. Course is repeatable to a maximum of 8 units.

HIST 276A. Seminar in Native American History. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor; HIST 276A. A continuation of HIST 276A. Students conduct research on 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, three hours; outside research, three 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 the 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 permission of advisor.

HIST 285A. Seminar in Latin American History. (4) Seminar, three hours; research, three hours. Course is repeatable to a maximum of 8 units.

HIST 285B. Seminar in Latin American History. (4) Seminar, three hours; research, three hours. Course is repeatable to a maximum of 8 units.

HIST 290. Directed Studies. (1-6) Prerequisite(s): limited to graduate students. A program of study designed to advise and assist graduate student in the given field. Course is repeatable to a maximum of 16 units.

HIST 291. Individual Study in History. (1-12) Prerequisite(s): graduate standing or consent of instructor. Grade Satisfactory (S) or No Credit (NC). Course is repeatable.

HIST 292. Concurrent Analytical Studies. (1-4) Prerequisite(s): consent of the chair of the department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

HIST 299. Research for Thesis or Dissertation. (1-12) 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). Course is repeatable.

HIST 398-I. Internship in Historic Resources Management. (8-12) Research, twenty to forty hours for ten weeks. Prerequisite(s): consent of program coordinator. A ten-week 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 and discussion, two hours. Prerequisite(s): graduate standing. Required of all students in the Program in Historic Resources Management and open to other graduate students. Case study approach to 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.

HIST 110A. Colonial America. (4) Lecture, three hours; term paper, three 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.

HIST 110B. Revolutionary America. (4) Lecture, three hours; term paper, three 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.

HIST 110C. The Early Republic. The United States, 1789-1848. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of the political, economic, intellectual, and cultural forces that transformed the United States from a fledgling preindustrial nation into a sprawling, exuberant, capitalist society. Topics include industrialism, capitalism, Christianity, democracy, politics, slavery and racial structures, abolitionism, and American radicalism and nationalism.

HISA 113. Slavery and the Old South. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis of the American Civil War, with special attention to the impact of emancipation and the war on the Southern states. Cross-listed with WLDST 137B.

**HISA 122A. Religious Cultures in Early America.** (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. 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 157A.

**HISA 122B. Religious Cultures in Modern America.** (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor; HST 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 WLDST 137B.

**HISA 132. American Economic History.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Economic history of the United States from colonial times to the present. Cross-listed with ECON 123.

**HISA 133. Women, Gender, and Sexuality in U.S. History: 1850-Present.** (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the development of jazz from the late 1910s to the present to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with WLDST 137B.

**HISA 134. The African American Woman.** (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Uses professional literature of the social sciences and American history and other media to examine the achievements, myths, and stereotypes of the African American woman from her roots in ancient Africa to the present. Cross-listed with EILT 113.

**HISA 135. The Civil Rights Movement, 1950-1970.** (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the development of jazz from the late 1910s to the present to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with WLDST 137B.

**HISA 136. Jazz: A Social and Cultural History.** (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the development of jazz from the late 1910s to the present to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with WLDST 137B.

**HISA 137. Frontier History of the United States.** (4) Lecture, three hours; journal, one hour; term paper, two 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, three hours; journal, one hour; term paper, two hours. Prerequisite(s): upper-division standing or consent of instructor. History of California from the earliest discoveries to the present. Cross-listed with WLDST 137B.

**HISA 139. American Musical Subcultures: A Genealogy of Rock.** (4) Lecture, three hours; extra reading, zero to two hours; listening, two to three 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 music technology to community and individuality, gender and racial identity, political resistance, and the music industry. Cross-listed with MUS 140.

**HISA 140. California Indian History.** (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the development of jazz from the late 1910s to the present to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with WLDST 137B.

**HISA 141. Southwestern Indian History.** (4) Lecture, three hours; extra reading, three 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 music technology to community and individuality, gender and racial identity, political resistance, and the music industry. Cross-listed with MUS 140.

**HISA 142. Northwestern Indian History.** (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the development of jazz from the late 1910s to the present to a variety of religious traditions, movements, and cultures from 1800 to the present in the United States. Cross-listed with WLDST 137B.

**HISA 143. Native American Oral Literature.** (4) Lecture, three hours; extra reading, three 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. Cross-listed with WLDST 137B.

**HISA 144 (E-Z). Topics in Native American History.** (4) Lecture, three hours; individual study, three 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. Cross-listed with WLDST 137B.
HISTORY OF EUROPE

HISE 110. Ancient Historians. (4) Lecture, three hours; outside research, two hours; term paper, one 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, three hours; individual study, three 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, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Survey of the history of Greece from the Persians 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 115. The Roman Republic. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. The political, economic, institutional, social, and cultural history of Rome from its foundation until the end of the 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, three hours; term paper, three 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 Roman 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, three hours; outside research, three 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 120. Early Middle Ages. (4) Lecture, three hours; term paper, three 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, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Topics in medieval history, from the 12th to the 14th centuries, 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, three hours; term paper, three 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, three hours; outside research, three 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 premodern legal heritage of Europe (Roman law, early canon law, customary laws of various peoples), transformations of that heritage in the central Middle Ages (revelation 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 130. History of Christianity. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Christianity from its origins in antiquity to the present, with historical and thematic emphases determined by faculty expertise. Cross-listed with RIST 135.

HISE 131. The Renaissance. (4) Lecture, three hours; term paper, three 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, three hours; extra reading, three 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, three hours; individual study, three 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 practicing in the competitive public marketplace, 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, four hours; extra reading, three hours. Prerequisite(s): AHS 123 or BE 118 or permission of instructor. The relationship of patrons to art and the role of museums. Cross-listed with AHS 134.

HISE 135. Absolutism and Enlightenment. (4) Lecture, three hours; extra reading, two hours; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor or admission to the UC Washington Center Program. 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 megapatrions, 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 136. The Age of Revolution. (4) Lecture, three hours; extra reading, two hours; term paper, one 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 137. Nineteenth-Century Europe. (4) Lecture, three hours; term paper, three 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, Bis-
HISE 141. Europe, 1914-1945. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. The history of Europe since World War I and 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, three hours; term paper, three 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, three hours; term paper; three 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, three hours; extra reading, two hours; term paper, one 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 148A. Women and Gender in Early Modern Europe, 1348-1800. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, three 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, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the development of England from the sixth century until her emergence as a major power at the accession of George III. An assessment of social, economic, and political changes as well as important political events.

HISE 152. Modern Britain. (4) Lecture, three hours; term paper, three 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 political changes as well as important political events.

HISE 153. History of the Common Law. (4) Lecture, three hours; term paper, three 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 155. Tudor England. (4) Lecture, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. England from the sixteenth century to the reign of Elizabeth I. 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Analyses 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 161. Germany from the Middle Ages to Napoleon. (4) Lecture, three hours; term paper, three 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 special emphasis on the economic underpinnings of the period and the process of social and economic modernization.

HISE 165. Modern France. (4) Lecture, three hours; extra reading, three 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, three hours; assignment of remaining hours varies from segment to segment. Prerequisite(s): upper-division standing or consent of instructor. Selected topics addressing the issues of European history.

HISE 171. Early Russia. (4) Lecture, three hours; term paper, three 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 East Slavic origins of the Russian 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, three hours; term paper, three 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, three hours; term paper, three 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 174. Russia Since 1917. (4) Lecture, three hours; on-line discussion, one 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 Krushchev, Brezhnev, and Gorbachev years. Revolution and change in a traditional society will be a central theme.

HISE 175 (E-Z). Topics in Russian History. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Selected topics addressing the issues of Russian history. E. The Stalin Period.

HISE 176. Serbia, Bosnia, and Kosovo: The Contemporaneous Crisis and Its Historical Roots. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Explores historical precedent in the different Yugoslav crises. 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.

HUMAN DEVELOPMENT

Subject abbreviation: HMDV

Program Office, 1434 Life Sciences Psychology (909) 787-5386

The major in Human Development has been discontinued. Students currently working toward the B.A. degree in Human Development (as well as readmitted students and transfer students accepted before Fall 2004) will be allowed to complete the degree requirements but must graduate by Summer 2006. For a listing of degree requirements consult the 2001-2002 UCR General Catalog.

UPPER-DIVISION COURSES

HMDV 106. Practicum in Child Development. (4) Lecture, three hours; practicum, three hours. Prerequisite(s): upper-division standing. Characteristics of individuals with physical and mental disabilities, emotional disturbance, visual impairments, deaf, or gifted. Emphasizes educationa programs and considers the effects of gender, socioecono, ethnic, and linguistic factors. Cross-listed with EDC 106.

HMDV 116. The Exceptional Child. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing. Characteristics of individuals with physical and mental disabilities, emotional disturbance, visual impairments, deaf, or gifted. Special emphasis on the educational and social implications of being exceptional. Cross-listed with EDC 116.

HMDV 117. Mental Retardation. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing. Characteristics of individuals with physical and mental disabilities, emotional disturbance, visual impairments, deaf, or gifted. Emphasizes educationa programs and considers the effects of gender, socioecono, ethnic, and linguistic factors. Cross-listed with EDC 117.
HMVD 120. Guidance in Special Education. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): EDUC 116/HMVD 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 linguistic backgrounds. Cross-listed with EDUC 120.

HMVD 129. Educational Assessment of Individuals with Disabilities. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): EDUC 116/HMVD 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. Cross-listed with EDUC 129.

HMVD 130. Mild and Moderate Disabilities. (4) Lecture, three hours; written outside work, three hours. Prerequisite(s): EDUC 116/HMVD 116 or consent of instructor. Explores characteristics, etiology, and identification of individuals with mild/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. Cross-listed with EDUC 130.

HMVD 131. Moderate and Severe Disabilities. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): EDUC 116/HMVD 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. Cross-listed with EDUC 131.

HMVD 135. Psycholinguistics. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012; or equivalents; or consent of instructor. Introduction to psycholinguistics emphasizing the psychological implications of linguistic theory, including the effect of syntactic structure on the comprehension, production, and retention of speech; and the process of word generation and models of the adult language user. Cross-listed with PSYC 155.

HMVD 150. Human Micro-evolution. (4) Lecture, three hours; out-of-class research. Prerequisite(s): ANTH 002 or ANTH 002H, relevant preparation in the life sciences; or consent of instructor. The methods of classical and population genetics applied to the understanding of evolution and variation in contemporary human populations. Cross-listed with ANTH 150.

HMVD 160. Sociology of Education. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative analysis of educational institutions in complex societies and their relationship to the society's political and economic structure with an examination of the school as a societal subsystem consisting of teacher, student, and administrator roles and its own evolving subculture. Cross-listed with SOC 160.

HMVD 160A. Development in Infancy and Childhood. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. An overview of the developmental processes from the prenatal period to late childhood. Covers physical growth as well as development in the motor, perceptual, cognitive, emotional, and social areas. Cross-listed with PSYC 160A.

HMVD 160B. Development in Adolescence and Adulthood. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; HMVD 160A/PSYC 160A; or equivalents; or consent of instructor. An introduction to the biological, social, and cognitive processes that influence development beyond childhood. Discusses contemporary theoretical approaches to the study of stability and change in adolescence and adulthood. Topics include physical and intellectual functioning, personality, social roles and relationships, and coping and adjusting. Cross-listed with PSYC 160B.

HMVD 161. Personality Development. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Study of the development of human personality from birth through late adolescence. Emphasis is on the impact of interpersonal relationships on the acquisition of human traits, emotional reactions, and patterns of adjustment. Cross-listed with PSYC 161.

HMVD 163. Cognitive Development. (4) Lecture, three hours; discussion, one 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 intellectual development of the child from birth to maturity, mechanisms of intellectual growth, and the relationship between language development and cognitive development. Cross-listed with PSYC 163.

HMVD 165. The Cultural Bases of Human Development. (4) Lecture, three hours; extra reading, three hours. 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 cultural development of the child from birth to maturity, mechanisms of intellectual growth, and the relationship between language development and cognitive development. Cross-listed with PSYC 165.

HMVD 166. Adolescent Development. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Examines individual and relational development from early adolescence into young adulthood. Emphasis is on the mutual influences of family relationships and adolescent development as well as the linkages between family, peer group, school experience, and the broader sociocultural context of development. Topics include the psychosocial aspects of puberty, cognitive, affective and socioemotional adjustment during adolescence. Cross-listed with PSYC 166.

HMVD 174. Socialization and Personality. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001 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 will be historical and cross-cultural, with particular attention to the relationship among family structure, social structure, and socialization processes. Cross-listed with SOC 174.

HMVD 182. Urban Problems. (4) Lecture, three hours; term paper, three 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 and URST 182.

HMVD 193. Senior Seminar in Human Development. (2) Seminar, two hours. The goal of the seminar is to provide those students who are in their last or next-to-last quarter a summary experience in which they are exposed to a variety of developmental topics. Consultation with the instructor, each student will prepare a project for presentation to the seminar. The project may be a significant extension of a paper prepared for a previous course or a new reading or research project developed for the seminar.
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.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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

1. Upper-division requirements (38-unit minimum)
   a) A minimum of 32 units directly related to the chosen central concept
   b) At least 6 units (but not more than 8 units) HASS 195 and/or HASS 196

2. 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, FREN 155, HISE 131, MUS 101A, SPN 140 (E-Z), HASS 195 (8 units).

Two-field Option

1. Upper-division requirements (56 units)
   Twenty-eight (28) units in each of two fields, supervised by a faculty advisor

2. The committee may require upper-division courses beyond those indicated above if the topic of study requires specific language, quantitative, or methodological proficiency.

**HASS 001. Step-by-Step to College Success for Freshmen.** (2) Lecture, one hour; discussion, one hour. Prerequisite(s): none. 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). Credit is awarded for only one of HASS 001, HASS 002, or HNPG 010A.

**HASS 002. Step-by-Step to College Success for Transfer and Reentry Students.** (2) Lecture, one hour; discussion, one hour. Prerequisite(s): none. 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). Credit is awarded for only one of HASS 001, HASS 002, or HNPG 010A.

**HASS 003. Step-by-Step to College Success: Expanded Horizons.** (1) Lecture, one hour; discussion, one hour. Prerequisite(s): HASS 001 or HASS 002 or consent of instructor. An investigation of strategies for the development of critical thinking processes. Students intensively explore selected topics initially presented in HASS 001 or HASS 002. Emphasis is on the development of academic and career goals. Includes weekly reading and writing assignments. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of ANTH 181G, HASS 003, or HNPG 010A.

**HASS 005. Library Research Strategies.** (2) Lecture, two hours. Prerequisite(s): second-quarter freshman or beyond. An introduction to library research strategies and resources which will give students knowledge necessary for self-sufficient study on the college level and beyond. Emphasis will be placed on development of appropriate research strategies utilizing integrated knowledge of resources available.

**HASS 020A. Flashpoint: The Individual in Conflict.** (4) Lecture, three hours; screening, three 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 Humanities (Additional) requirement for the College of Humanities, Arts, and Social Sciences.

**HASS 020B. Conflict by Design: Scales of Organization, Power, and Authority.** (4) Lecture, three hours; screening, three 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.

**HASS 020C. At Odds with All Things: The Roles of Conflict in Philosophy, Art, and Literature.** (4) Lecture, three hours; screening, three 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.

**HASS 021A. Asian/Americans Making Culture: Religion.** (4) Lecture, three hours; extra reading, three 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) requirement for the College of Humanities, Arts, and Social Sciences.

**HASS 021B. Asian/Americans Making Culture: Music.** (4) Lecture, three hours; outside research and term paper, three 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, three hours; extra reading, three 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 yearlong, 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, three hours; extra reading, three 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. Also fulfills the Anthropology/Psychology/Sociology requirement.

**HASS 022B. U.S.-Mexican Borderlands: Theatre and Performance.** (4) Lecture, three hours; extra reading, three 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; three hours; extra reading, three 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, but not both.

HASS 023A. Concepts of the Physical Sciences through Science Fiction. (4) Lecture; three hours; scheduled screening, three 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 023A and HASS 023C. Credit is awarded for only one of HASS 023A or ENPG 057F. 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; three hours; extra reading, three 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 science 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; three hours; scheduled screening, three 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 023A or ENPG 057F. 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; three hours; workshop, one 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 Interdisciplinary requirement for the College of Humanities, Arts, and Social Sciences.

HASS 024B. A Course about Me: Autobiography in Literature and Performance. (4) Lecture; three hours; workshop, one 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; three hours; screening, three 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 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 068B. The 1960s and the Vietnam Era. (4) Lecture; three hours; screening, three 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; three hours; screening, three 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 090. Special Studies. (1-3) Individual study, three to nine 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, ten to fifteen 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.

HASS 198-I. Internship. (1-12) Internship, ten hours a week for each four 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. Does not fulfill University breadth requirements.
See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

JOURNALISM MINOR

The Minor in Journalism program is not currently accepting new students. Please contact the Creative Writing Department at (909) 787-2414 for current information on the status of the program.

LATIN AMERICAN STUDIES

Subject abbreviation: LNST

Steven Helfand, Ph.D., Chair
Committee Office, 2417 Humanities and Social Sciences
(909) 787-2743
latinamericanstudies.ucr.edu

Committee in Charge
Eugene N. Anderson, Ph.D. (Anthropology)
Alicia Arrizon, Ph.D. (Ethnic Studies/Women's Studies)
Wendy Ashmore, Ph.D. (Anthropology)
James P. Brennan, Ph.D. (History)
Peter Briscoe, M.L.S., M.A. (Rivera Library)
Amelia Cabezas, Ph.D. (Women's Studies)
Marcelle Chauvet, Ph.D. (Economics)
Ronald H. Chilcote, Ph.D. Emeritus (Economics)
Carlos E. Cortés, Ph.D. Emeritus (History)
Maria Luz Cruz Torres, Ph.D. (Anthropology)
Eduardo Douglas, Ph.D. (Art History)
Scott L. Fedick, Ph.D. (Anthropology)
Alfredo Figueroa, B.A. (Chicano Student Programs)
E. Mark Hanson, Ph.D. (Education/Management)
Steven Helfand, Ph.D. (Economics)
Jonathan Hilsley, Ph.D. (Political Science)
Josh Kun, Ph.D. (English)
Michael Kearney, Ph.D. (Anthropology)
Tiffany Lopez, Ph.D. (English)
Patricia O'Brien, Ph.D.
Dean, College of Humanities, Arts, and Social Sciences, ex officio

MAJOR

Latin American Studies is an interdisciplinary, area studies major, developed to allow a combination of many different yet related disciplines. This interdisciplinary focus permits the student to study the anthropology, economics, geography, history, sociology, languages and cultures of a particular region in order to gain a broader 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 the dynamics of agrarian reform in rural Mexico. This flexibility allows the possibility of completing a double major with other departments, for example, Latin American Studies and History, Latin American Studies and Spanish, Latin American Studies and Political Science.

UCR is a member of the Southern California Conference on International Studies (SOCCIS) and participates actively in the Latin American Studies section of it. As part of this program, UCR students have the opportunity to participate in an Interdisciplinary Seminar on Latin American Studies, which is offered once a year on the campus of a member institution. The seminar content varies from year to year.

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.

The B.A. degree itself is valuable preparation for many careers, including the U.S. diplomatic service, international organizations abroad, large overseas corporations, banking, foreign missions, agriculture, and teaching.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

The major requirements for the B.A. degree in Latin American Studies are as follows:

1. Lower-division requirements
   a) Proficiency in Spanish to the SPN 005 level or in Portuguese to the level of PORT 004
   b) Additional course work in Spanish and/or Portuguese recommended for students interested in careers in Latin American fields

2. Upper-division requirements (36 units)
   a) At least two courses in three of the following groups, or two courses in two groups and one in each of the other two groups (24 units total):
      (1) ANTH 115S, ANTH 140S
      (2) HISA 160, HISA 161
      (3) LNST 118A, LNST 118B
      (4) POSC 162, POSC 163
   b) Twelve (12) units selected from a list of committee-approved upper-division Latin American Studies related courses available in the program office

Minor

Latin American Studies offers a minor consisting of 20 upper-division units.

To complete the requirements for the minor, students must select five courses from three of the following groups:

1. ANTH 115S, ANTH 140S
2. ECON 113
3. HISA 160, HISA 161
4. LNST 118A, LNST 118B
5. POSC 162, POSC 163
6. SPN 120A, SPN 120B, SPN 120C

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

UPPER-DIVISION COURSES

LNST 118A. Survey of Latin American Culture and Civilization: Pre-Columbian Period to Independence. (4) Lecture, three hours; read and consult, one hour. Covers the pre-Columbian period to independence. No knowledge of Spanish is necessary. Credit is awarded for only one of the LNST 118A and LNST 118B sequence or SPN 102B.

LNST 118B. Survey of Latin American Culture and Civilization: Modern Period. (4) Lecture, three hours; read and consult, one hour. Covers the modern period. No knowledge of Spanish is necessary. Credit is awarded for only one of the LNST 118A and LNST 118B sequence or SPN 102B.

LNST 153. Contemporary Latin American and Chicano Novels. (4) Lecture, three hours; term paper, three 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 ENST 153.

LNST 164. Gender and Development in Latin America. (4) Seminar, three hours; outside research, three 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 168. Caribbean Culture and Society. (4) Seminar, three hours; outside research, three 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 ENST 148.

LNST 186. People and the Environment in Latin America. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. An interdisciplinary course focusing on the study of the relationship between human communities and the environment in Latin America. Environmental problems and policies are examined. Cross-listed with ANTH 186.

LNST 190. Special Studies. (1-5) Consent of the instructor and the Latin American Studies Committee required.
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 serves several purposes: it 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.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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. Requirements for Law and Society (36 units)

   a) PHIL 007 or PHIL 007H
   b) LWSO 100
   c) One course chosen from the following list: ECON 111, POSC 114, PSYC 012, SOC 110A (or equivalent course in research methods)
   d) Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159 (One of these courses may be replaced by a substitute choice from a list of courses published annually by the Law and Society Faculty Committee. Not more than two of the courses taken to meet this requirement [2.d] may be from the same department.)
   e) LWSO 193, Senior Seminar

Note: 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).

UPPER-DIVISION COURSES

LWSO 100. Introduction to the Study of Law and Society. (4) Lecture, three hours; discussion, one hour; extra reading, three 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.

LWSO 193. Senior Seminar in Law and Society. (4) Seminar, three hours; term paper, three hours. Prerequisite(s): LWSO 100; senior standing in Law and Society. 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 the 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.

LESBIAN, GAY, BISEXUAL, INTERSEXUAL, AND TRANSGENDER STUDIES MINOR

Subject abbreviation: LGBS

George E. Haggerty, Ph.D., Chair
Office, 2209 Humanities and Social Sciences
(909) 787-5301, x1458
english.ucr.edu/lgb/lgbhome.html

Committee in Charge

Alicia Arritón, Ph.D. (Ethnic Studies/Women’s Studies)
Gregory W. Bredbeck, Ph.D. (English)
Amalia Cabezas (Women’s Studies)
Richard Godbeer, Ph.D. (History)
George E. Haggerty, Ph.D. (English)
Masako Ishii-Kuntz, Ph.D. (Sociology)
Molly McGarry (History)
Ethan Nasreddin-Longo, Ph.D. (Music)
Amy A. Ongiri, Ph.D. (English)
James Tobias, Ph.D. (History)
Erika Suderburg, M.F.A. (Art)
James Hobbs, Ph.D. (English)
Carole-Anne Tyler, Ph.D. (English)

George E. Haggerty, Ph.D. (English)
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, and Bisexual 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; reorientations of gender; sexuality and cultural diversity; intersections of sexualities and ethnic identities.

Requirements for the minor (24 units)

1. Lower-division requirements (4 units):
   a) WMST 001 or LGBS 001

2. Upper-division requirements (20 units):
   a) Four (4) units of English: ENGL 122, ENGL 120US, ENGL 140GG, or ENGL 143 (E-Z)/FVC 143 (E-Z)
   b) Four (4) units of HISA 130/WMST 130, or ETST 124
   c) Four (4) units of AES 182 or AES 186/FVC 186; or DNCE 141 or DNCE 142
   d) Four (4) units of PSYC 160A/HMDV 160A or PSYC 160B/HMDV 160B or PSYC 161/HMDV 161; or SOC 177E or SOC 177F; or LGBS 198-I
   e) Four (4) units from those listed above or LGBS 195
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 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.

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

### LOWER-DIVISION COURSE

**LGBS 001. Introduction to Lesbian, Gay, Bisexual, and Transgender Studies.** (4) Lecture, three hours; extra reading, three 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 193. Senior Seminar.** (4) Seminar, three hours; outside research, three 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.** (1-12) Consultation, one hour; internship, two to twenty-four hours; term paper, one to eleven 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 8 units.

### MAJOR

The Liberal Studies interdisciplinary major offers a broad liberal education. The first two years introduce students to the traditional areas of learning and attempt to provide them with an understanding of their interrelationships.

During the junior and senior years, students select at least two fields of concentration. The purpose is to provide a focus for students’ educational interests that enables them to acquire competence in the methodology and goals of two fields of concentration by extending and deepening investigations begun during the first two years.

Concentration requirements are sufficiently flexible to enable students to prepare for graduate or professional school training as well as pursue their interests in other areas.

### Preparation for Teaching

Liberal Studies majors who plan to teach in California elementary schools can take advantage of UCR’s Bridge to Teaching Program (see Education). With careful planning, using many of the same courses, prospective elementary teachers can complete the approved subject matter preparation program along with their Liberal Studies major while also including early field experience in the schools. After selecting their major subject area concentration from List A, they will usually take a set of core Education courses as their minor concentration (see List B).

### Degree Requirements

#### University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

#### College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

#### Major Requirements

The major requirements for the B.A. degree in Liberal Studies are as follows:

1. **Lower-division requirements**
   a) Foreign Language or Mathematics from one of the following:
      (1) Achievement of proficiency at the 5th quarter level in one foreign language
      (2) Achievement of proficiency at the 4th quarter level in one foreign language and LING 020

   (3) Completion of a year (12 units minimum) of college-level mathematics from MATH 009A or MATH 009B, plus one from MATH 009C, MATH 023, CS 008 or STAT 048

   (4) MATH 022, MATH 023, plus CS 008 or STAT 048

### Note

Liberal Studies requires additional proficiency or course work beyond the college of Humanities, Arts, and Social Sciences foreign language breadth requirement. Mathematics options (3) and (4) are alternatives to foreign language for Liberal Studies but do not replace the college foreign language requirement. Transfer students, who are not held for college breadth (Intersegmental General Education Transfer Curriculum; Reciprocity) must still meet one of the above options for the major.

b) Pre-Concentration requirement: 64 units from the following groups of courses with a minimum of 12 units in each group

#### Group I

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<tr>
<td>BCH 010</td>
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<td>BPSC 013</td>
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Group III
CLA 010A, CLA 010B, CLA 010C, CLA 027A, CLA 027B, CLA 040
CPAC 001, CPAC 002
ENGL 012A, ENGL 012B, ENGL 012C, ENGL 012 (E-Z), ENGL 014, ENGL 015, ENGL 017, ENGL 023A-ENGL 023B-ENGL 023C, ENGL 031, ENGL 032
ETST 008
ETST 012/RLST 012
EUR 025, EUR 047
FVC 020
FVC 021/WRIT 021
FREN 030, FREN 040, FREN 045
PHIL 001 or PHIL 001H, PHIL 002 or PHIL 002H, PHIL 007 or PHIL 007H, PHIL 008 or PHIL 008H, PHIL 030 (E-Z)
RLST 005, RLST 007, RLST 008, RLST 010, RLST 015
WRIT 017A, WRIT 017B, WRIT 017C, WRIT 025
WMST 010

Group IV
AHS 009/ANTH 009, AHS 027/ANTH 027
ART 001, ART 002, ART 003, ART 006/FVC 006
ART 004/FVC 004
AHS 007, AHS 015, AHS 016, AHS 017A, AHS 017B, AHS 017C
CRWT 056
DNCE 005, DNCE 007, DNCE 014
MUS 001, MUS 002, MUS 006/ANTH 006, MUS 008, MUS 030A, MUS 030B, MUS 030C, MUS 031
THEA 010, THEA 050, THEA 070, THEA 038/ART 028/FVC 028

2. Upper-division requirements (40-unit minimum)
By the junior year (90 units) students must choose two areas of concentration.

First Area of Concentration
Minimum of 24 upper-division units chosen from one subject area in list below.

Second Area of Concentration
Minimum of 16 upper-division units chosen from a different subject area in the list below.

Note: A maximum of 4 units of 190-199 courses may be used between the two areas of concentration. Students must submit a written proposal for advisor’s approval prior to enrolling in the course. All courses taken in the two areas of concentration must be taken for letter grades. The courses required for each area of concentration are based on departmental recommendation. When the two areas have been chosen, students must obtain the approval of a member of the Liberal Studies Committee. For information call (909) 787-2743.

MANAGEMENT
Subject abbreviation: MGT
Y. Peter Chung, Ph.D., Interim Dean
The A. Gary Anderson Graduate School of Management
Baijs Dodin, Ph.D., Associate Dean
Alan H. Lewis, M.B.A., Assistant Dean
Charlotte M. Weber, Ph.D., Assistant Dean
School Office, 162 Anderson Hall
(909) 787-4551; agsm.ucr.edu

Professors
Y. Peter Chung, Ph.D.
Bajis M. Dodin, Ph.D.
E. Mark Hanson, Ph.D. (Management/Education)
Herbert E. Johnson, Ph.D.
Sarkis J. Khoury, Ph.D.
Woody Liao, Ph.D.
David Mayers, Ph.D. Philip L. Boyd Chair in Finance
Siegfried Schable, Ph.D.

Associate Professors
Mohsen El-Hafsi, Ph.D.
Kathleen Montgomery, Ph.D.
Waymond Rodgers, Ph.D.
Erik Rolland, Ph.D.
G. Lawrence Zahn, Ph.D.

Assistant Professors
Wendy J. Bailey, Ph.D.
Allen D. Blay, Ph.D.
Carolyn A. Galantine, Ph.D.
John Gerdes, Ph.D.
Livia A. Markoczy, Ph.D.
Vassilios Polimenis, Ph.D.
Winfred Tredler Profitl, Ph.D.
Joong Y. Son, Ph.D.
Andrew Spicer, Ph.D.
Shuba Srinivasan, Ph.D.
John Tillquist, Ph.D.
Sha Yang, Ph.D.

Lecturers
Bruce Samuelson, D.B.A.
Charlotte M. Weber, Ph.D.

Cooperating Faculty
Henry J. Vaux, Jr., Ph.D. (Environmental Sciences)
Mart Molle, Ph.D. (Computer Science and Engineering)
Thomas H. Payne, Ph.D. (Computer Science and Engineering)
Chinya Ravishankar, Ph.D. (Computer Science and Engineering)
Scott R. Tilley, Ph.D. (Computer Science and Engineering)

THE SCHOOL
The A. Gary Anderson Graduate School of Management (AGSM) emphasizes personal interaction among faculty and graduate students in its classes and advising. The school resides in a 30,000-square-foot home featuring state-of-the-art research and teaching facilities.

The MBA 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, sufficient sections of courses are offered in the evening to permit career professionals to pursue the MBA part time. The mixture of career professionals and recent baccalaureate graduates provides a stimulating and well-rounded classroom environment.

The AGSM 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 an introductory workshop available each quarter, in AGSM 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.

An MBA Student Association represents student interests at faculty meetings and arranges student activities. Student evaluations of courses are an important part of the evaluation of curriculum and faculty performance.

GRADUATE PROGRAM
The A. Gary Anderson Graduate School of Management offers a professional graduate program leading to the Master of Business Administration (MBA) degree. The course of study provides a balanced approach to the art
and science of management, with an emphasis on managing through information, and recognizes the global context of management in today's business world. 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.

The MBA 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 92-unit program (23 courses), all students take 48 units in a common body of knowledge which consists of courses in statistics, managerial economics, financial accounting, organizational behavior, management science, computer systems, finance, marketing, business and society, and management synthesis. Students select two of the following courses to complete common body of knowledge requirements: human resources management, cost and management accounting, operations management. Thereafter, students complete a required internship, 28–36 units selected from electives, a capstone business strategy course, and a thesis or case project. All students also must complete a nondegree credit workshop in management communication.

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, corporate environmental 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.

**Normative Time to Degree** 8 quarters.

**Master of Business Administration**

Candidates for the MBA 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 a group case analysis as part of the capstone strategy 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.

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), letters of recommendation, and managerial experience.

**GRADUATE COURSES**

**MGT 200. Managing Behavior in Organizations.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): MGT 404 or consent of instructor. Examines human behavior in organizations and its implications for management decisions and actions. Explores the theory and practice of working with and managing people. Topics include motivation, learning, group dynamics, leadership, communication, organizational structure and culture.

**MGT 201. Statistics for Management.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MGT 404 or equivalent; familiarity with Microsoft’s Excel spreadsheet software. Teaches how to generate decision-making information from data and solve 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. Cross-listed with STAT 232.

**MGT 202. Financial Management.** (4) Lecture, three hours; outside projects and extra reading, three hours. Prerequisite(s): MGT 200 or equivalent. Examines corporate financial management, with an emphasis on managing the firm’s human and financial 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 203. Managerial Economics.** (4) Lecture, three hours; individual study, three hours. Prerequisite(s): MGT 403 or equivalent. Studies the micro-, macro-, and global economic environments of managerial decisions. 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, exchange rates, and international relationships in trade and finance.

**MGT 204. Cost and Management Accounting.** (4) Lecture, three hours; outside projects, three 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. Computer Systems for Management.** (4) Lecture, three hours; laboratory, one hour; outside projects and reading, two hours. Prerequisite(s): graduate standing; familiarity with basic computer operations and software packages. Examines the operation and management of information systems and their application to 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 206. Introduction to Management Science.** (4) Lecture, three hours; outside projects and readings, three hours. Prerequisite(s): MGT 404 or equivalent. An introduction to the application of the scientific method and the solution of management decision problems. Stresses the art of modeling (problem formulation) and the use of quantitative methods and computer software to solve quantified problems. Topics include linear programming, networks, and decision analysis.

**MGT 207. Production and Operations Management.** (4) Lecture, three hours; outside projects and readings, three hours. Prerequisite(s): MGT 206 and MGT 211/STAT 232. Analyzes the design, operation, and control of production systems using modern analytical techniques. Compares production technologies from the U.S., Japan, and other countries. Topics include product design and process selection, capacity and location planning, facility layout, scheduling, project management, inventory and quality control. Computers and case studies are emphasized.

**MGT 208. Business, Government, and Society.** (4) Lecture, three hours; individual study, three 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, three hours; individual study, three hours. Prerequisite(s): MGT 403 or equivalent. Examines 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, three hours; outside projects and reading, three hours. Prerequisite(s): MGT 200. Introduces methods for managing the firm’s human and financial 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, three hours; outside research, three 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 212. Management Synthesis.** (4) Lecture, three hours; outside projects and extra reading, three hours. Prerequisite(s): MGT 200, MGT 202, MGT 203, MGT 205, MGT 206, MGT 208, MGT 209, MGT 211 (MGT 203 and MGT 208 may be taken concurrently). A team-taught, integrative case course that focuses on managing the complex tasks of the total organization and examines the interdependence of the functional areas of management. Student teams analyze cases involving several functional areas and recommend actions for improvement.

**MGT 215. International Comparative Management.** (4) Lecture, three hours; outside projects and readings, three hours. Prerequisite(s): graduate standing. Comparative analysis of significant management practices. The impacts of cultural, political, social, and economic
international relations.

conditions, product safety, environmental impact, and
tions. Seeks to increase the students' ability to identify and
include the ethical dimension present in most policy deci-
three hours. Examines ethical dilemmas faced by man-
social groups.

the components of executive compensation; and the divi-
separation of ownership from control; board monitoring;
management, and the board of directors and their effects
three hours. Prerequisite(s): MGT 210 or consent of
instructor. Discusses 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. Management Control Systems. (4)
Lecture, three hours; outside projects and readings, three
hours. Prerequisite(s): MGT 204 or equivalent. Discusses
the role of accounting information in the design and
implementation of management control systems.
Responsibility accounting and performance evaluation will
be emphasized. Complex issues related to management
control systems will be discussed through cases.

MGT 230. Databases for Management. (4)
Lecture, three hours; outside projects and readings, three
hours. Prerequisite(s): MGT 205. Examines the features
and capabilities of database management systems, includ-
ing database classification, data structures, file organiza-
tions, evaluation, and management of database systems.

MGT 231. Corporate Finance and Investment. (4)
Lecture, three hours; outside problem sets and extra read-
ing, three hours. Prerequisite(s): MGT 202. An intensive
analysis of the effects of various corporate financial policy
decisions on the value of the firm, including a discussion
of the effects of taxes, bankruptcy costs, and agency costs
on these decisions. Examines the interrelation of financing
policy with executive compensation, leasing, hedging, and
payout policies. Provides an understanding of the theoreti-
cal issues involved in the choice of these policies.

MGT 233. Marketing Research. (4)
Lecture, three hours; outside projects and extra reading, three
hours. Prerequisite(s): MGT 201/STAT 232, 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 prop-
er use of statistical methods and the use of computers for
data analysis.

MGT 234. Case Studies In Marketing Manage-
ment. (4) Lecture, three hours; outside projects and research,
three hours. Prerequisite(s): MGT 209 or consent
of instructor. A decision-oriented course with special
emphasis on strategic decision making and involving
 pricing, product positioning, promotion, and distribution.
Case studies are used to illustrate applications.

MGT 235. Business Policy and Strategy. (4)
Lecture, three hours; outside projects and reading, three
hours. Prerequisite(s): MGT 212. Studies the formulation,
implementation, and evaluation of business unit and cor-
porate strategies and the organizational policies and man-
agerial practices that support them. Theory is applied to
actual general management problems using cases, group
exercises, and other simulations of strategic challenges.

MGT 236. Decision Making Under Certainty. (4)
Lecture, three hours; outside projects and extra reading,
three hours. Prerequisite(s): MGT 206 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,
ter and nonlinear programming, and multiple criteria
decision analysis. Examines applications and case studies
in operations, logistics, finance, and marketing.

MGT 237. Multinational Financial Manage-
ment. (4) Lecture, three hours; outside projects and read-
ings, three hours. Prerequisite(s): MGT 202. The funda-
amentals of financial management on an international
scale are examined. Topics covered include the interna-
tional financial systems (past, current, and proposed),
balance of payments, foreign exchange markets (spot, for-
ward, futures, options), the euromarkets, measurement of
foreign exchange risk, hedging foreign exchange risk, the
international capital asset pricing model, and trade
financing.

MGT 239. Simulation for Business. (4) Lecture,
three hours; outside projects and extra reading, three
hours. Prerequisite(s): MGT 201/STAT 232; MGT 205. Introduces
computer simulation as a tool for analyzing complex decision problems. Analysis and discussion of
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 manufac-
turing, finance, health services, and public policy.

MGT 240A. Taxation. (4) Lecture, three hours;
outside projects and extra reading, three hours.
Prerequisite(s): MGT 211 or equivalent consent of
instructor. Covers federal income tax laws as they apply to
individuals, partnerships, and corporations. Also discuss-
etax planning, tax policy, and other special tax issues.

MGT 240B. Advanced Taxation. (4) Lecture, three
hours; outside case analysis, three 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, alter-
native minimum tax, investment losses, employee compen-
sation, corporate distributions, and federal transfer taxes.

MGT 241. Accounting Systems and Control. (4)
Lecture, three hours; outside projects and readings, three
hours. Prerequisite(s): MGT 210 or consent of
instructor. Examines the formulation of accounting
principal, related issues will be emphasized.

MGT 242. Accounting Policy Making. (4) Lecture,
three hours; outside research, three hours. Prerequi-
site(s): MGT 211 or consent of instructor. Examines the
accounting policy-making process from a management
perspective. Topics include the formulation of accounting
policy, the institutional framework of accounting, the
development of accounting standards, and accounting pol-
icy alternatives for issues such as revenue recognition,
valuation of assets and liabilities, intangibles, and foreign
exchange accounting. Cases are heavily used for illustrat-
ing accounting problems.

MGT 243. Product Development. (4) Lecture,
three hours; outside projects and extra reading, three
hours. Prerequisite(s): MGT 209 or consent of instructor.
Develops a framework for the development of new product
concepts through new product introduction. Emphasis is
given to tactical and strategic decisions in product posi-
tioning and policy. Relies on extensive computer-based
analysis.
MGT 244. Cases in Financial Management. (4) Lecture, three hours; written case analyses and reports, three hours. Prerequisite(s): MGT 202, MGT 251. Provides intensive examination of methods and the economic analysis of problems of corporate financial policy. Specific case topics include advanced capital budgeting, cost of capital estimation, corporate valuations, mergers and acquisitions, transactions, recapitalizations, capital structure policy, corporate taxation and repurchase, risk management, and dividend policy. Case reports, both written and oral, are required.

MGT 245. Financial Statement Analysis. (4) Lecture, three hours; outside research, three 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, three hours; outside projects, three 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, three 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, three hours; outside research, two hours; extra reading, one 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, three hours; consultation or discussion, one 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 252A. Securities Markets. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MGT 202. Discusses portfolio theory, including the Markowitz model. Addresses pricing in the capital markets with an emphasis on the Capital Asset Pricing Model and the Arbitrage Pricing Theory. Covers empirical issues in testing these models. Other topics addressed include risk-adjusted portfolio performance, term structure of interest rates, bond pricing, and bond portfolio management.

MGT 252B. Speculative Markets. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MGT 201/STAT 252, MGT 202, MGT 252A or consent of instructor. Covers various topics in derivatives markets. Introduces pricing techniques for forwards, futures, options, swaps, and other derivatives. Addresses risk management and investment strategies with derivatives.

MGT 257. Marketing Strategy. (4) Seminar, three hours; consultation, one hour. Prerequisite(s): MGT 209 or consent of instructor. A framework is developed for strategic 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 259. Operations Planning and Control. (4) Seminar, three hours; outside projects and extra reading, three 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 MBP and JIT inventory systems. Emphasizes the importance of integration, flexibility, and automation of the operation system.

MGT 260. Contemporary Issues in Management. (4) Seminar, three hours; outside reading, three hours. Prerequisite(s): graduate standing or consent of instructor. A seminar focusing on selected topics in contemporary management practices. Topics will include key concepts in leadership, motivation, management of change, societal issues, community relations, and organizational development. The course will rely heavily on the perspectives of invited business professionals.

MGT 264. Information Systems Resources Management. (4) Seminar, three hours; outside research, two hours; extra reading, one 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, three hours; outside projects and extra reading, three hours. Prerequisite(s): MGT 205, MGT 206; 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, three hours; extra reading and project, three hours. Prerequisite(s): MGT 206 or equivalent. Deals with issues of project planning and control. Topics include differences between projects and production systems, project selection, project teams, breakthrough structures of organization and work, scheduling and budgeting, resources management, project evaluation, and current project management software.

MGT 267. Applied Business Forecasting. (4) Seminar, three hours; outside project, three hours. Prerequisite(s): MGT 204/STAT 232 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 relationships between variables, trend analysis, and seasonal forecasting. Uses case studies and applications from a variety of management areas.

MGT 268. Funding the Entrepreneurial Venture. (4) Seminar, three hours; case studies, two hours; extra reading, one hour. Prerequisite(s): MGT 246 or consent of instructor. Provides a working knowledge of the many financing vehicles and techniques employed in financing new and emerging ventures. Topics include identifying opportunities; deal structure; sources of debt and equity financing; valuation techniques; later-stage financing strategies; and the harvest.

MGT 269. The New Venture and the Business Plan. (4) Seminar, three hours; outside research, two hours; case study preparation, one 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. Doctoral Seminar in Corporate Finance. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MGT 244 or consent of instructor. Provides an introduction to the theory of finance as applied to corporate issues. Topics include the Modigliani and Miller theorems concerning optimal capital structure and dividend policy and the Miller theory of capital structure equilibrium.

MGT 271. Doctoral Seminar in Portfolio Theory and Investments. (4) Seminar, three hours; research, three hours. Prerequisite(s): MGT 207 or consent of instructor. Examines the latest research in portfolio theory (including the use of options and futures markets), capital budgeting, and applied econometric methods of testing the theories studied.

MGT 272. Global Strategy and Management. (4) Seminar, three hours; outside projects, three 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 273. International Accounting. (4) Seminar, three hours; extra reading and term paper, three hours. Prerequisite(s): MGT 211 or equivalent. Examines the context and issues of comparative international accounting and financial reporting practices. Provides a working understanding of international accounting practices for international business, investments, and capital market interests.

MGT 274. Advanced Topics in Finance. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MGT 202. Explores the latest developments in theoretical or empirical finance. Topics covered may include asset pricing, performance evaluation, derivative securities, market microstructure, corporate finance, and corporate control and governance.

MGT 275. International Banking. (4) Seminar, three hours; research, three hours. Prerequisite(s): MGT 202, MGT 227. Discusses the motives behind the multinationalization of commercial banking activities, the international banking markets, international banking services—swaps, underwriting, foreign exchange, portfolio management, immunization techniques, etc., and the set of risks unique to international operations.

MGT 276. Corporate Financial Policy and Control. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MGT 251 or equivalent. Examines the theory and empirical evidence for models of corporate financial policy. Includes analysis of new issues of securities, asset sales, recapitalizations, stock repurchases, and the market for corporate control (tender offers, mergers, proxy fights, and corporate voting rights). Emphasizes critical evaluation of the evidence for different models of corporate financial policy.

MGT 277. Advanced Financial Accounting. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): BSAD 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 278. Auditing and Assurance Services: Theory and Practice. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): BSAD 165B or equivalent. An in-depth examination of audit processes and procedures. Develops audit judgment skills through the identification and resolution of issues associated with the auditing practice.
MGT 279. Investment Management. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MGT 252A or equivalent. Covers advanced topics in equity management. Discusses portfolio theory, market microstructure, structure analysis, valuation, investment management strategies, and essential backroom operations such as accounting and reporting. Provides hands-on experience in investment management.

MGT 280. Business Issues in Electronic Commerce. (4) Seminar, three hours; outside project, three hours. Prerequisite(s): MGT 280 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, three hours; outside project, three hours. Prerequisite(s): MGT 280, 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, three hours; outside project, three hours. Prerequisite(s): MGT 280. 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 285 (E-Z). Special Topics in Management. (4) Seminar, three hours per week or thirty hours per quarter; assignment of the remaining hours varies from segment to segment. Prerequisite(s): graduate standing; consent of instructor. Additional prerequisites are required for some segments of this course; see the School. Covers topics not contained in a regular course. Topics are announced at the time of offering.

MGT 290. Directed Studies. (1-6) Prerequisite(s): MGT 280. Provides an understanding of the various business issues and problems related to the degree. May be repeated for up to 8 units of credit toward the degree. Satisfactory (S) or No Credit (NC). May be repeated; not for degree credit.

MGT 403. Review of Quantitative Methods for Management. (4) Lecture, three hours; laboratory, one hour; individual study, two 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. Management Communication Workshop. (2) Lecture, one hour; workshop, three hours. Prerequisite(s): graduate standing. Teaches students to communicate effectively as managers through examination and practice of communication concepts, techniques, and skills. Topics include business writing, interpersonal skills, oral presentations, meeting leadership, and working in multicultural teams. Not for degree credit. Satisfactory (S) or No Credit (NC) grading is not available.

MINOR

MARXIST STUDIES MINOR

Stephen E. Cullenberg, Ph.D., Chair
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Committee in Charge
Edna Bonacich, Ph.D. (Ethnic Studies and Sociology)
Stephen E. Cullenberg, Ph.D. (Economics)
Carole Fabrant, Ph.D. (English)
Michael Kearney, Ph.D. (Anthropology)
Victor D. Lippit, Ph.D. (Economics)
Benedict Magnus, Ph.D. (Philosophy)
Irwin M. Wall, Ph.D. (History and Religious Studies)
Patricia O’Brien, 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)

1. Theory, method, and history of thought requirement
   a) ECON 115
   b) PHIL 153

2. Four courses from the following dealing with applications of Marxist studies in various fields:
   a) ANTH 131
   b) ECON 175
   c) POSC 160A
   d) POSC 160B
   e) WRLT 170/ETST 170
   f) WRLT 180X

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 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.

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

MATHEMATICS

Subject abbreviation: MATH

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Professors
John C. Baez, Ph.D.
Bruce L. Chalmers, Ph.D.
Mei-Chu Chang, Ph.D.
Vijayantini Ghari, Ph.D.
Gerhard Gierz, Ph.D.
Lawrence H. Harper, Ph.D.
Michel L. Lapidus, Ph.D.
Xiao-Song Lin, Ph.D.
Ivan B. Penkov, Ph.D.
Yat Sun Poon, Ph.D.
Ziv Ran, Ph.D.
Malempati M. Rao, Ph.D.
David E. Rush, Ph.D.
Reinhard Schultz, Ph.D.
Albert R. Stralka, Ph.D.
Bun Wong, Ph.D.

Professors Emeriti
Theodore J. Barth, Ph.D.
Richard E. Block, Ph.D.
John E. de Pillis, Ph.D.
Charles J. A. Halberg, Jr., Ph.D.
Frederic T. Metcalf, Ph.D.
Louis J. Radfitt, Jr., Ph.D.
Victor I. Shapiro, Ph.D.
James D. Stafney, Ph.D.

Associate Professors
Le Baron O. Ferguson, Ph.D.
Neil E. Gretsky, Ph.D.
Frederick H. Wilhelm, Jr., Ph.D.
Feng Xu, Ph.D.

Associate Professor Emeriti
J. Keith Oddson, Ph.D.

Assistant Professors
Michael Anshelevich, Ph.D.
Zhang-Dan Guan, Ph.D.
Qi S. Zhang, Ph.D.

PROFESSIONAL COURSES
Cooperating Faculty
Marek Chrobak, Ph.D. (Computer Science and Engineering)
Thomas H. Payne, Ph.D. (Computer Science and Engineering)

MAJOR
The Department of Mathematics offers a B.A. and a 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 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.

Academic Advising
Each Mathematics major is assigned a departmental 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.

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. The latter usually requires three quarters and includes education courses and supervised teaching.

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 preferably, completing an undergraduate program that is state approved for teacher preparation.

UCR has an approved undergraduate program (Subject Matter Preparation Program) for mathematics majors who plan to teach secondary level grades (7–12). 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.

Further information about courses, requirements, and examinations can be obtained at the Student Affairs Office (202 Surge Building) and the Graduate School of Education (1124 Sproul Hall).

Degree 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
To fulfill the Natural Sciences requirement, the Department of Mathematics requires the following:

1. One of the year sequences
   a) BIOL 002, BIOL 003, BIOL 005C
   b) CHEM 001A, CHEM 001B, CHEM 001C
   c) PHYS 002A, PHYS 002B, PHYS 002C or PHYS 040A, PHYS 040B, PHYS 040C

2. Either one course in the physical sciences 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
1. Lower-division requirements: MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
2. Four (4) units of either one course in Computer Science or one upper-division course in Statistics
3. 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 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046, CS 010 (CS 012 is recommended).

1. Pure Mathematics program (56 units)
   a) 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
   b) At least three courses from (a) above must be from MATH 145A, MATH 145B, MATH 151A, MATH 151B, MATH 151C
   c) Courses in the MATH 190–199 series are excluded
   d) Ten (10) 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.)

2. 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:
   a) Biology option
      (1) BIOL 005A, BIOL 051A, BIOL 055B, BIOL 055C
      (2) MATH 149A
      (3) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C
      (4) BIOL 102, BIOL 105, BIOL 108, BIOL 117
      (5) Four (4) additional units of upper-division biology
   b) Chemistry option
      (1) CHEM 001A, CHEM 001B, CHEM 001C
      (2) Either PHYS 040A, PHYS 040B, PHYS 040C (preferred); or PHYS 002A, PHYS 002B, PHYS 002C
      (3) Four courses from MATH 120, MATH 135A, MATH 135B, MATH 149A, MATH 149B, MATH 149C, MATH 165A, MATH 165B
      (4) CHEM 110A, CHEM 110B, CHEM 111, CHEM 113
      (5) Four (4) additional units of upper-division chemistry
   c) Economics option
      (1) MATH 120, MATH 121, MATH 149A, MATH 149B, MATH 149C

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(2) Twenty (20) units of upper-division economics to consist of ECON 102A and four courses to be chosen from ECON 102B, ECON 105A, ECON 103B, ECON 107, ECON 108, ECON 110, ECON 111, ECON 134/BSAD 134, ECON 135, ECON 143A/ENSC 143A, ECON 143B/ENSC 143B, ECON 143C/ENSC 143C, ECON 156, and ECON 206

d) Environmental Sciences option
(1) CHEM 001A, CHEM 001B, CHEM 001C
(2) ECON 006/ENSC 006
(3) GEO 001 is recommended
(4) MATH 149A
(5) Three courses from MATH 120, MATH 121, MATH 135A, MATH 135B, MATH 149B, MATH 149C, CS 177, STAT 155
(6) ENSC 100, ENSC 100L, ENSC 101, ENSC 102
(7) Eight (8) additional units of upper-division environmental sciences

e) Physics option
(1) MATH 135A, MATH 165A, MATH 165B
(2) Either MATH 120 or MATH 171
(3) PHYS 130A, PHYS 130B
(4) Either PHYS 135A, PHYS 135B, PHYS 136 or PHYS 150A, PHYS 150B

f) Statistics option
(1) MATH 120, MATH 149A, MATH 149B, MATH 149C
(2) Either STAT 130 or STAT 146
(3) STAT 161, STAT 170A, STAT 170B, STAT 171

3. Computational Mathematics program
a) MATH 112, MATH 113 or MATH 131, MATH 120, MATH 132, MATH 135A, MATH 135B
b) CS 012, CS 014, CS 141, CS 150
c) One additional CS course to be chosen from the list of approved technical elective courses.
d) Twenty-four (24) units of technical electives to be chosen from
(1) MATH 121, MATH 125A, MATH 125B, MATH 140A, MATH 146B, MATH 146C, MATH 149A, MATH 149B, MATH 149C, MATH 171
(2) CS 130, CS 133, CS 166, CS 170, CS 171, CS 177

Mathematics Honors Program
Candiates for the Honors Program in Mathematics must complete
1. Nine (9) units of upper-division mathematics in addition to the requirements of the major
2. MATH 145B, MATH 151A-MATH 151B-MATH 151C, and MATH 171 with a grade of "B" or better in each course and have an overall GPA of at least 3.50 in mathematics
3. One of the following:
   a) A paper based on an approved plan of independent study
   b) Three one-quarter graduate courses in mathematics with a grade of "B" or better

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 requirements (20 units): MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B
2. Upper-division requirements: 24 units of upper-division mathematics courses, with no more than 8 units in courses required by the student’s major 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 Undergraduate Studies section of this catalog for additional information on minors.

Education Abroad Program
The Mathematics Department encourages eligible students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

GRADUATE PROGRAMS
Domestic applicants to graduate programs in the Department of Mathematics must supply GRE scores for the General Test (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 of the department are as follows:
1. Completion of two of the following sequences: MATH 201A, MATH 201B, MATH 201C; MATH 205A, MATH 205B, MATH 205C; MATH 209A, MATH 209B, MATH 209C; or MATH 210A, MATH 210B, with a grade of "C" or better in each course and a GPA of 3.00 in each chosen sequence
2. As a substitute for one or more course sequences in (1), passing a Ph.D. qualifying examination fulfills the course requirement of the corresponding sequence
3. Taking 36 units of approved courses, of which at least 18 must be in the 200 series courses in mathematics
4. Completion of the courses MATH 131, MATH 132, MATH 151A, and MATH 151B, or their equivalents

M.S. in Mathematics (Applied)
General university requirements are listed in the Graduate Studies section of this catalog. Specific requirements of the department 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. 36 units of approved courses, of which 18 must be in the 200 series
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 in Mathematics
Specific requirements of the department 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 placement examinations are scheduled each year before the fall quarter begins. They are mandatory for entering freshmen and recommended for advanced standing students who wish to enroll in MATH 003, MATH 005, MATH 009A, MATH 014, MATH 015, MATH 022, or MATH 023.

To qualify for MATH 009A, MATH 022, and MATH 023, a student must score at least 36 (60%) on the Pre-Calculus Examination. To qualify for MATH 009B, MATH 014, and MATH 015, a student must score at least 18 (30%) on the Pre-Calculus Examination or at least 27 (60%) on the Mathematical Analysis Examination.

MATH 003. Basic Algebra. (0) Lecture, two hours; laboratory, four hours. Prerequisite(s): an appropriate score on the Pre-calculus Exam or the Math Analysis Readiness Exam as determined by the Mathematics Department. Covers basic algebra, including linear functions and equations, quadratic functions and equations, and operations with functions. Designed to prepare students for MATH 005. Does not meet any mathematics or physical science requirement. Carries worldwide credit equivalent to 4 units but does not count towards graduation units.

MATH 005. Introduction to College Mathematics. (5) Lecture, four hours; discussion, one hour. Prerequisite(s): MATH 003 with a grade of “C-” or better or equivalent, or a sufficiently high test score on the Mathematical Analysis Examination, as determined by the Mathematics Department. A study of inequalities, absolute value, functions, graphing, logarithms, trigonometry, roots of polynomials, and other elementary concepts of mathematics.

MATH 009A. First-Year Calculus. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 009A 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 009A or MATH 09HA.

MATH 009B. First-Year Calculus. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 009B 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, three hours; discussion, one hour. Prerequisite(s): MATH 009B with a grade of “C-” or better or MATH 09HA 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, three hours; discussion, one hour. Prerequisite(s): a score of 4 or higher on the AB Advanced Placement Test in Mathematics or MATH 009A with a grade of “A-” or better or MATH 09HA with a grade of “A-” or better. Honors course corresponding to MATH 009B for students with strong mathematical background. 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, three hours; discussion, one hour. Prerequisite(s): MATH 09B with a grade of “A-” or better or MATH 09HB with a grade of “A-” or better. Honors course corresponding to MATH 009B for students with strong mathematical background. 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, three hours; discussion, one 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 derivatives, Jacobians, gradients, chain rule, and Taylor’s theorem for several variables.

MATH 010B. Calculus of Several Variables. (4) Lecture, three hours, discussion, one hour. Prerequisite(s): MATH 010A with a grade of “C-” or better or MATH 09HC with a grade of “C-” or better. 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 014. Mathematics, A Humanistic Approach. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 003 or equivalent. Intended to fulfill the breadth requirement for students outside the natural and agricultural sciences. A survey of numerical and logical methods illustrating the role of mathematics in the development of civilization. Topics will include integration, rational, and irrational numbers; number systems; infinity; the concept of proof; as well as a glimpse of calculus. Only one of MATH 014 or MATH 015 may be taken for credit.

MATH 015. Liberal Arts Mathematics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 003 or equivalent. Designed to fulfill the breadth requirement for students outside the natural and agricultural 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, three hours, discussion, two hours. Prerequisite(s): MATH 005 with a grade of “C-” or better or MATH 023. Explores relations and functions (linear, polynomial, logarithmic, and exponential), differential calculus of functions of one and two variables, and integration (inequality 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 009A or MATH 09HA.

MATH 023. Applied Matrix Algebra. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 005 with a grade of “C-” or better or MATH 022 or MATH 09A or MATH 09HA or equivalent. A study of matrices, linear dependence and independence, ranks, systems of linear equations, determinants, eigenvalues, and eigenvectors with business and economic applications. Designed for students who are not Mathematics majors.

MATH 046. Introduction to Ordinary Differential Equations. (4) Lecture, three hours, discussion, one hour. Prerequisite(s): MATH 005 with a grade of “C-” or better or MATH 09A with a grade of “C-” or better or equivalent. Introduction to first-order equations, linear second-order equations, series solutions, and Laplace transforms, with applications to the physical and biological sciences.

UPPER-DIVISION COURSES

MATH 112. Finite Mathematics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 009A, CS 010. Introduction to the basic concepts of finite and structural mathematics with emphasis on applications to computer science. Topics include axiomatic systems, combinatorics, propositional and predicate calculus, graph theory, trees, state diagrams, networks, induction, elementary enumeration, and recurrence relations.

MATH 113. Applied Linear Algebra. (5) Lecture, three hours; discussion, two hours. Prerequisite(s): concurrent enrollment in or completion of MATH 010A. 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, three hours; discussion, one hour. Prerequisite(s): MATH 10A, MATH 113 or MATH 151 (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, three hours; discussion, one hour. Prerequisite(s): MATH 10A. Games in extensive, normal, and characteristic form as models of conflict and/or cooperation. Two-person zero-sum games, minimax theorem, relation to linear programming. Non-zero-sum games, Nash equilibriums theorem, bargaining, the core, Shapley value. Economic market games.

MATH 125A. Introduction to Combinatorics. (4) Lecture, three hours, discussion, one hour. Prerequisite(s): MATH 009C or MATH 09HC, MATH 112. Introduction to elements of graph theory and the theory of counting.

MATH 125B. Introduction to Combinatorics. (4) Lecture, three hours, discussion, one hour. Prerequisite(s): MATH 009C or MATH 09HC, MATH 112, MATH 125A. Continuation of MATH 125A. Topics include the principle of inclusion-exclusion, the Hall matching theorem, and combinatorial designs.

MATH 131. Linear Algebra I. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): concurrent enrollment in or completion of MATH 010A. 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, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): MATH 113 or MATH 131 or consent of instructor. 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, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 012, or equivalent. An introduction to vector spaces, matrices, and linear transformations. Credit is awarded for only one of MATH 113 or MATH 131.
MATH 135B. Numerical Analysis. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CS 010B, MATH 131, MATH 135A. 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, three hours; discussion, one hour. Prerequisite(s): MATH 113 or MATH 131. Prime and composite integers, number theoretic functions, diophantine equations, congruences, quadratic reciprocity, additive arithmetic.

MATH 137A. Plane Curves. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B, MATH 132. A study of the complex projective plane, homogeneous polynomials, plane curves, intersection multiplicities, and Bezout's theorem.

MATH 137B. Plane Curves. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B, MATH 132. Topics include simple and singular points, tangents, and duality; the structure of cubic curves; and birational transformations and the resolution of singularities.

MATH 138A. Introduction to Differential Geometry. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 113 or MATH 131. Elementary theory of curves and surfaces. First and second fundamental forms.

MATH 138B. Introduction to Differential Geometry. (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B, MATH 138A. Gaussian curvature; geodesics; Gauss-Bonnet Theorem.

MATH 144. Introduction to Set Theory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A. Algebra of subsets of a set. Algebra of relations and functions. Cardinal and ordinal numbers and their arithmetic operations. The well-ordering theorem, transfinite induction, and Zorn's lemma.

MATH 145A. Introduction to Topology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 144. Elementary topology in metric spaces.

MATH 145B. Introduction to Topology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 145A. Geometric topology; algebra associated with finite complexes and applications.

MATH 146A. Ordinary and Partial Differential Equations. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 046. Focuses on the theory of linear differential equations and transform methods.

MATH 146B. Ordinary and Partial Differential Equations. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, MATH 146A. Further study of theory of linear differential equations and problems in valuing ordinary differential equations.

MATH 146C. Ordinary and Partial Differential Equations. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, MATH 146A, MATH 146B. Explores boundary value problems for partial differential equations, orthogonal expansions, and separation of variables.

MATH 149A. Probability and Mathematical Statistics. (4) Lecture, three hours; laboratory, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, MATH 149A. 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, three hours; laboratory, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, MATH 149A, MATH 149B. Continuation of MATH 149B. Topics include tests of hypotheses, estimation, maximum likelihood (s) 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 151A. Advanced Calculus. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, MATH 149A; or consent of instructor. Involves a rigorous development of mathematical analysis, real and complex numbers, sequences and series, continuity, differentiation, and the Riemann-Stieltjes integral.

MATH 151B. Advanced Calculus. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 046, MATH 149A, MATH 151A; or consent of instructor. Continuation of MATH 149B. Further study of several variables, integration of different forms, and Lebesgue integration.

MATH 153. History of Mathematics. (4) S Lecture, three hours; discussion, one hour or term paper, three hours. Prerequisite(s): MATH 009C or consent of instructor. A survey from a historical point of view of various developments in mathematics with particular emphasis on the nineteenth and early twentieth centuries.

MATH 165A. Introduction to Complex Variables. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B. An introduction to the theory of analytic functions of a complex variable. Includes mappings by elementary functions, complex integrals, as well as Cauchy's theorem, power series, and Laurent series.

MATH 165B. Introduction to Complex Variables. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B. Continuation of MATH 165A. Topics include the theory of residues, conformal mapping, and applications to physical problems.

MATH 171. Introduction to Modern Algebra. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 131, MATH 144. An introduction to the fundamental concepts of modern algebra: groups, subgroups, quotient groups, homomorphisms, symmetry groups, fundamental properties of rings, integral domains, ideals, and quotient rings.

MATH 172. Modern Algebra. (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 171. Fundamental concepts of modern algebra: groups, fields, polynomial, geometric constructions, algebraic coding, boolean algebra.

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 191 (E-Z). Seminar in Mathematics. (1-4) Lecture, three hours; outside research, three hours. Prerequisite(s): consent 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 eight units.

MATH 201A. Algebra. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 171, MATH 172, or equivalents. Topics include basic theory of groups and rings, the Sylow theorems, solvable groups, the Jordan-Holder theorem.

MATH 201B. Algebra. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 201A. Topics include rings, the functors hom and tensor, modules over a principle ideal domain, and applications to matrices.

MATH 201C. Algebra. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 201B. Topics include algebraic and transcendental extensions of fields and the Galois theory, and the tensor and exterior algebras.

MATH 205A. Topology. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 145B or equivalent. An introduction to point set topology.

MATH 205B. Topology. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 205A or equivalent. Covers homotopy theory and homology theory.

MATH 205C. Topology. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 205A, MATH 205B, or equivalents. Covers differential topology.

MATH 209A. Real Analysis. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 210A. Topics include Lebesgue measure, integration, and differentiation.

MATH 209B. Real Analysis. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 209A. Topics include representation theorems, Hilbert space, Lebesgue spaces, and Banach spaces.

MATH 209C. Real Analysis. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): MATH 210A. Studies include entire and meromorphic functions, normal families and the Riemann mapping theorem, and harmonic and analytic functions of the derivative problem.

MATH 211A. Ordinary Differential Equations. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 151C. Topics include 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 ordinary differential equations.

MATH 211B. Ordinary Differential Equations. (4) Lecture, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): MATH 151G 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, three hours; discussion, one hour. Prerequisite(s): MATH 112B. Introduction to combinatorial optimization and combinatorial geometry including flows on networks, matroids, linear programming, and lattices.

MATH 216B. Combinatorial Theory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 216A. Introduction to combinatorial optimization and combinatorial geometry including optimal programming, exchange properties, Mobius function, Galois connection, and coordinization.

MATH 217A. Theory of Probability. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 209A, MATH 209B, 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 Helly-Bray theorem, and Bochner’s theorem on positive definite functions.

MATH 217B. Theory of Probability. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 217A. Topics include infinitely divisible distributions, the law of the iterated logarithm, and Markov processes.

MATH 220. Approximation Theory. (4) Lecture, three hours; research, three hours. Prerequisite(s): MATH 209C. The study of the best approximation operator including the classical Chebyshev theory concerning approximations of continuous functions from a fixed finite-dimensional subspace (e.g. nth degree polynomials). Also a study of the minimal projection operator.

MATH 221. Several Complex Variables. (4) Lecture, three hours; research, three hours. Prerequisite(s): MATH 216B, MATH 2165A, MATH 165B. Hartog’s theorems, domains of holomorphy, pseudconvexity, Levi’s problem, coherent analytic sheaves, Gartner’s theorems A and B.

MATH 223. Algebraic Number Theory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 205A. Algebraic number theory, including principal ideal domains, integral independence, algebraic number fields, classical ideal theory in Dedekind domains, classes of ideals, valuations, p-adic number.

MATH 224. Introduction to Homological Algebra. (4) Lecture, three hours; research, three hours. Prerequisite(s): MATH 205C; or PHYS 205; or consent of instructor. Introduction to derived functors and its application to rings and associative algebras.

MATH 225A. Commutative Algebra. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 205A, MATH 205B, MATH 201C. Studies include basic theory of commutative rings, primary decomposition, integral dependence and valuation rings, and the invariance theorem of Krull.

MATH 225B. Commutative Algebra. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 225A. Studies include structure theorems for complete local rings and geometric local rings.

MATH 227A. Lie Algebras. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): MATH 227A. Studies include enveloping algebras and representation theory, representations of semisimple Lie algebras, generalization to Kac-Moody Lie algebras, and modular Lie algebras.

MATH 228. Functional Analysis. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 209A, MATH 209B, MATH 209C. Topological linear spaces; functional spaces; linear operators; spectral theory; operational calculus; and further selected topics.

MATH 229A. Stochastic Processes. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 217A, MATH 217B; or consent of instructor. Topics include sample path analysis of stochastic processes, in particular, separability and regularity properties. Course is repeatable.

MATH 232. Stochastic Processes. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 229A. Topics include martingale and Markov processes, stochastic integration, semimartingales, and stochastic differential equations. Course is repeatable.

MATH 232A. Geometry I (Introduction to Manifolds). (4) Lecture, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): MATH 252A. Local and global theory of curves. Surfaces in R3: the Gauss map, fundamental forms, curvature. Riemannian geometry: the Levi-Civita connection, curvature, geodesics, exponential map, completeness, Gauss-Bonnet theorem for surfaces.

MATH 241. Mathematical Physics: Classical Mechanics. (4) Lecture, three hours; research, three 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 243A. Algebraic Geometry. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): MATH 205A, MATH 205B, MATH 205C. 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, three hours; outside research, three hours. Prerequisite(s): MATH 243A. Topics include further study of varieties, sheaves, and cohomology and detailed study of curves and special topics.

MATH 246A. Algebraic Topology. (4) Lecture, three hours; discussion, one hour. 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, three hours; discussion, one hour. Prerequisite(s): MATH 246A. Covers topics such as topological indices, Lefschetz fixed point theory, Poincare duality, vector bundles and characteristic classes, and transformation groups.

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 may be repeated.

MATH 299. Research for Thesis or Dissertation. (1-12) Prerequisite(s): consent of department. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

MATH 302. Apprentice Teaching. (2-4) Lecture, zero to one hour; seminar, two to four hours; consultation, one to two 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 / 299

Subject abbreviation: ME

Shankar Mahalingam, Ph.D., Chair
Department Office, A368 Bourns Hall
(909) 787-2417
engr.ucr.edu/mechanical

Professors
Qing Jiang, Ph.D.
Shankar Mahalingam, Ph.D.
Lung-Wen Tsai, Ph.D.
Kambiz Vafai, Ph.D.
Akula Venkatram, Ph.D.

Assistant Professors
Frank Jacobitz, Ph.D.
Cengiz Ozkan, Ph.D.
Guanshu Xu, Ph.D.

Cooperating Faculty
Jie Chen, Ph.D. (Electrical Engineering)
Marek Chrobak, Ph.D. (Computer Science and Engineering)
Jay A. Farrell, Ph.D. (Electrical Engineering)
William A. Jurly, Ph.D. (Environmental Sciences)
Ping Liang, Ph.D. (Electrical Engineering)
Umar Mohieen, Ph.D. (Physics)
Joseph M. Norbeck, Ph.D. (Chemical and Environmental Engineering)

Major

The goals of the Mechanical Engineering program at UCR are to provide students with the knowledge and adaptive and social skills required to enter and function in rapidly evolving industry, to prepare students for graduate studies by providing opportunities for undergraduate research, to provide an education with the breadth and the intellectual discipline required to enter professional careers in fields
outside engineering such as business and law, to produce students with a strong sense of service to the larger community they live in, and to inculcate in them the intellectual curiosity required for 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 engr.ucr.edu/mechanical.

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. See engr.ucr.edu/studentaffairs/registration.htm for details.

## Degree Requirements
### University Requirements
See the Undergraduate Studies section for requirements that all students must satisfy.

## College Requirements
See Degree Requirements, The Marlan and Rosemary Bourns College of Engineering, in the Undergraduate Studies section, for requirements that students must satisfy.

The Mechanical Engineering major uses the following major requirements to satisfy the college’s Natural Sciences and Mathematics breadth requirement.

1. One course in the biological sciences chosen from an approved list
2. CHEM 001A, CHEM 001B, CHEM 001C
3. MATH 009A

### Major Requirements

#### 1. Lower-division requirements (76 units)

a) Biological Science elective
b) CHEM 001A, CHEM 001B, CHEM 001C
c) CS 010
d) EE 001A, EE 011A
e) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
f) ME 007, ME 009, ME 010, ME 014
g) PHYS 040A, PHYS 040B, PHYS 040C

#### 2. Upper-division requirements (81 units)

a) ENGR 118
b) ME 100A, ME 100B, ME 103, ME 110, ME 115A, ME 115B, ME 116A, ME 120, ME 121, ME 130, ME 170A, ME 170B, ME 175A, ME 175B
c) STAT 040 or STAT 155
d) Technical electives (16 units); four courses, selected from the following list, in consultation with an advisor: ME 116B, ME 117, ME 122, ME 131, ME 133, ME 136, ME 137, ME 153

### Sample Program

#### Freshman Year

<table>
<thead>
<tr>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<tr>
<td>MATH 009A, MATH 009B</td>
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<td>MATH 009C</td>
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<td>PHYS 040A, PHYS 040B</td>
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#### Sophomore Year

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<td>MATH 046</td>
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<td>PHYS 040C</td>
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<td>EE 001A, EE 011A</td>
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<td>ME 007, ME 009, ME 010, ME 014</td>
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<td>4</td>
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<tr>
<td>Biological Science Elective</td>
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<tr>
<td>Humanities/Social Sciences</td>
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<td>Total Units</td>
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#### Junior Year

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<td>ME 100A, ME 103, ME 110, ME 115A, ME 116A, ME 120, ME 130, ME 170A</td>
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<td>ENGR 118</td>
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<tr>
<td>STAT 040 or STAT 155</td>
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<tr>
<td>Humanities/Social Sciences</td>
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<td>Total Units</td>
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#### Senior Year

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<tr>
<td>Total Units</td>
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<td>16</td>
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### GRADUATE PROGRAM

The Department of Mechanical Engineering offers graduate educational programs leading to M.S. and Ph.D. degrees. Areas of research focus include air quality modeling, combustion, design theory and automation, fluid mechanics, fracture and deformation of materials, heat transfer, microelectromechanical systems (MEMS), nanotechnology, robotics, smart materials, and transport phenomena.

**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.

Applicants to the master’s degree program 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 demonstrate proficiency in spoken English by securing a “clear pass” on the SPEAK test prior to graduation, but students are encouraged to complete this requirement within their first year of residence at UCR.

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 graduate-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 four 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 take 1 unit 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.

**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 four 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 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 usually during the spring quarter of every year, and in the fall quarter, if needed.
Doctoral Degree

The procedures 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

All international students whose first language is not English must demonstrate proficiency in spoken English by securing a “clear pass” on the SPEAK test, prior to graduation, but students are encouraged to complete this requirement within their first year of residence at UCR.

Course Work

Although there is no strict course or unit requirement, the department recommends a minimum of 36 units of graduate-level and upper-division courses, exclusive of seminar and research (ME 250, ME 297, and ME 299). In addition, students must fulfill a six-quarter residency requirement. Students must take a seminar (ME 250) for at least three quarters. They are expected to pursue a program of study that includes 1) a major area of study intended to increase the student’s depth of knowledge in a major area (i.e., an area of specialty in mechanical engineering); and 2) a minor area of study intended to support and increase the student’s breadth of knowledge in the major area, the minor area being in a basic science area related to the student’s area of specialty. A coherent program of at least 24 units of graduate course work (including 16 units of Mechanical Engineering graduate courses) in the major area should satisfy the major requirement. A coherent program of at least 12 units of graduate or upper-division course work, or both, in the minor area should satisfy the minor requirement. The student and the faculty advisor should formulate this program within in two quarters after admission to the program, and it must be approved by the student’s advisor and graduate committee.

Preliminary Examination

The preliminary 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 appointment to qualifying and dissertation committees.

Foreign Language Requirement

None

Refer to the department’s graduate program guidelines for further details.

LOWER-DIVISION COURSES

ME 007. Introduction to Engineering Fabrication Processes. (1) Laboratory, three hours. Prerequisites: (s); ME 009. Topics include principles of design for manufacture: precision measurements and tolerances; properties of metals such as hardness, machinability, and responses to heat treatment; theory and practice of precision metal-cutting operations; turning, boring, drilling, reaming, and milling; safety practices and procedures; and computer-controlled machining. Graded Satisfactory (S) or No Credit (NC).

ME 009. Engineering Graphics and Design. (4) Lecture, three hours; laboratory, three hours. Prerequisites: ME 004, MATH 009C. Equilibrium of coplanar force systems; analysis of frames and trusses; noncoplanar force systems; friction; distributed loads.

ME 014. Properties of Engineering Materials. (4) Lecture, three hours; discussion, one hour. Prerequisites: CHEM 001A or CHEM 014A, PHYS 040B (may be taken concurrently). Introduces applications of basic principles of physics and chemistry to the selection and use of engineering materials. Examines the relationship between structure and mechanical and electrical properties of technological materials.

ME 100A. Thermodynamics. (4) Lecture, three hours; discussion, one hour. Prerequisites: (s); MATH 010A, PHYS 040B; or consent of instructor. 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, 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, ENGR 110, or ME 100A.

ME 100B. Thermodynamics. (4) Lecture, three hours; discussion, one hour. Prerequisites: (s); ME 100A or consent of instructor. Covers additional thermodynamic concepts and applications relevant to mechanical engineering. Topics include the second law of thermodynamics, entropy function, entropy production, exergy analysis of cycles, equations of state, thermodynamic property relations, multiphase and multicomponent systems, combustion stoichiometry, thermochemistry, and chemical availability of fuels.

ME 103. Dynamics. (4) Lecture, three hours; discussion, one hour. Prerequisites: (s); CS 010, MATH 010A, ME 010. 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 116. Mechanics of Materials. (4) Lecture, three hours; discussion, one hour. Prerequisite: (s); MATH 046, ME 010. Topics include mechanics of deformable bodies subjected to axial, torsional, shearing, and bending loads; combined stresses; columns; energy design; and their applications to the design of structures.

ME 115A. Fluid Mechanics. (4) Lecture, three hours; discussion, one hour. Prerequisites: (s); ENGR 115B, MATH 010A, PHYS 040B; or consent of instructor. Introduces principles of fluid mechanics relevant to mechanical engineering. Topics include shear stresses and viscosity, fluid statics, pressure, forces on submerged surfaces, control volume approach, mass conservation, momentum and energy equations, differential approach, turbulent flow in pipes, and turbomachinery. Credit is awarded for only one of CHE 114, ENGR 115, or ME 115A.

ME 115B. Fluid Mechanics. (4) Lecture, three hours; discussion, one hour. Prerequisites: (s); ME 115A or consent of instructor. Introduces additional concepts and applications of fluid mechanics relevant to mechanical engineering. Topics include potential flow theory, boundary layer flow, lift and drag forces on airfoils, and compressible flows.

ME 116A. Heat Transfer. (4) Lecture, three hours; discussion, one hour. Prerequisites: (s); ME 100A, ME 115A; or consent of instructor. Introduces the analysis of
steady and transient heat conduction, forced and natural convection, radiation heat transfer, and design of heat exchangers. Credit is awarded for only one of CHE 116, ENGR 116, and ME 116A.

ME 116B. Heat Transfer. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ME 116A or consent of instructor. 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, multi-node heat transfer and the simulation of thermal fields, and the heat transfer process.

ME 117. Combustion and Energy Systems. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ENGR 118, ME 100A, ME 115A; or consent of instructor. 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 air turbines.

ME 120. Dynamic Systems. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ME 120 or consent of instructor. Free and forced vibrations of lumped parameter systems, normal modes, coupling, and normal coordinates. Use of conservation principles. Lagrange's equation. Electromechanical analogs.

ME 121. System Dynamics and Control. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ENGR 118, ME 120; or consent of instructor. Covers the fundamentals of analyzing and designing dynamic linear control systems. Topics include the analysis of systems in terms of time response, frequency, and state-space models for dynamic systems.

ME 122. Vibrations. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ME 120 or consent of instructor. Free and forced vibrations of lumped parameter systems with and without damping; resonance. Matrix methods for multidimensional systems. Normal modes, coupling, and normal coordinates. Use of conservation principles. Lagrange's equation. Electromechanical analogs.

ME 130. Kinematic Analysis and Design of Mechanisms. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CS 010, ME 009, ME 103; ME 110. Topics include the kinematics, dynamics, and mechanical advantages of machinery; displacement velocity and acceleration analyses of Instantaneous law of gearing and analysis of various gear trains; and computer-aided mechanism design and analysis. A design project is required.

ME 131. Kinematic Synthesis of Mechanisms. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): ME 130 or consent of instructor. Design of planar, spherical, and spatial mechanisms using both exact and approximate graphical and analytical techniques. A computer-aided design project is required.

ME 133. Introduction to Mechatronics. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): EE 132, ME 120. Topics include fundamental hardware and software components for the design and control of mechatronic systems, intermediate analog and digital electronics, sensors, transducers and actuators, basic analog and digital control of electric and fluid actuator systems, and hardware implementation of real-time control systems.

ME 136. Environmental Impacts of Energy Production and Conversion. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ME 100A, ME 115B, or consent of instructor. Covers thermo-dynamics, 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, noise pollution, turbulent transport of pollutants, and principles used in the design of pollution control equipment.

ME 137. Geophysical Fluid Mechanics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ME 100A, ME 115B, or consent of instructor. Covers the application of hydrodynamics and mass transfer in the atmosphere and oceans. Topics include Coriolis force effects, geostrophic balance, thermal wind and shallow water equations, and waves in density stratified fluids.

ME 153. Applied Finite Element Methods. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ME 110. Introduction to the finite element method (FEM) and its matrix formulation and computer implementation. Also covers mesh generation and data visualization techniques. A term project using FEM computer codes is required.

ME 170A. Experimental Techniques. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): CS 010, EE 001A, EE 011A, ME 103; or consent of instructor. Covers the principles in the design of experiments and control, and the design 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, six hours; discussion, two hours. Prerequisite(s): ME 115B, ME 116A, ME 120, ME 170A; or consent of instructor. Analysis and verification of engineering theory using laboratory measurements in advanced, project-oriented experiments involving fluid flow, heat transfer, structural dynamics, thermodynamic systems, and electromechanical systems.

ME 175A. Mechanical Engineering Design. (4) Lecture, two hours; discussion, one hour; laboratory, three hours. Prerequisite(s): ME 007 (may be taken concurrently); senior standing in Mechanical Engineering. Students, working in small teams, develop a mechanical engineering device or system from concept to initial detailed design using the engineering design process. Lecture topics include engineering design methodologies, mechanical components, and communication. Graded In Progress (IP) until both ME 175A and ME 175B are completed, at which time a final, letter grade is assigned.

ME 175B. Mechanical Engineering Design. (4) Lecture, one hour; discussion, one hour; laboratory, six hours. Prerequisite(s): senior standing in Mechanical Engineering; ME 175A; or consent of instructor. Graphs In Progress (IP) for the design and prototype are required. Lecture topics include failure theories, life cycle design, human factors, engineering economics, engineering ethics, entrepreneurship, and intellectual property rights.

ME 190. Special Studies. (1-5) Individual study, three to fifteen 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.

Graduate Courses

ME 200. Methods of Engineering Analysis. (4) Lecture, four hours. Prerequisite(s): graduate standing in engineering or consent of instructor. Topics include linear algebra, 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, four 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 220. Theoretical Kinematics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): ME 200 or consent of instructor. Introduces spatial rigid body kinematics using homogeneous transformations, product of exponentials, and dual quaternion formulations. Covers screw theory, Lie theory, and Clifford algebras to provide students with the mathematical foundation for advanced studies in robotics, computer graphics, and mechatronics.

ME 221. Advanced Dynamics. (4) Lecture, four hours. Prerequisite(s): ME 105 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 222A. Introduction to Robotics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): EE 152 or equivalent, ME 120, ME 130; or consent of instructor. Introduces the mechanics of robotics systems. Topics include kinematics, dynamics, task planning, open and closed-loop control strategies, and robot programming languages. Explores the concept of parallel kinematic machines.

ME 222C. Robot Dynamics and Control. (4) Lecture, four hours. Prerequisite(s): EE 235, ME 221, ME 222A; or consent of instructor. Introduces recursive formulations for serial and parallel manipulator dynamics using Newton-Euler and Lagrangian approaches. Explores the structure of dynamics equations, trajectory generation and motion control, linear controllers, feedback linearization, and force controllers.

ME 230. Computer-Aided Engineering Design. (4) Lecture, three hours; laboratory, three 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 236. Geometric Nonlinear Control. (4) Lecture, four hours. Prerequisite(s): EE 235 or consent of instructor. Introduces methods of differential geometry and Lie group theory applied to nonlinear control systems. Topics include stability of nonlinear systems, center-manifold theory, controllability, and feedback linearization.

ME 240A. Fundamentals of Fluid Mechanics. (4) Lecture, four 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, four 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 241. Fundamentals of Heat and Mass Transfer. (4) Lecture, four 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 boundary value problems.

ME 246. Computational Fluid Dynamics with Applications. (4) Lecture, three hours; laboratory, three 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, four hours. Prerequisite(s): graduate standing or consent of instructor. Topics include chemical reaction dynamics 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 250. Seminar in Mechanical Engineering.** (1-2) Seminar, one to two 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 formal seminar receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC). Course is repeatable.

**ME 261. Theory of Elasticity.** (4) Lecture, four 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, four 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.

**ME 267. Finite Element Methods in Solid Mechanics.** (4) Lecture, four 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, four hours. Prerequisite(s): ME 014, ME 110 or equivalents. An introduction to the design and fabrication of microelectromechanical systems (MEMS). Topics include bulk and surface micromachining processes, material properties, mechanisms of transduction, applications in mechanical, thermal, optical, radiation, and biological sensors and actuators; fabrication of microfluidic devices; Bio-MEMS and applications; packaging and reliability concepts; and metrology techniques for MEMS. Also discusses directions for future research.

**ME 272. Nanoscale Science and Engineering.** (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): ME 014 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.

**ME 290. Directed Studies.** (1-6) Lecture, three to eighteen 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 297. Directed Research.** (1-4) Outside research, three to eighteen 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 12 units.

**ME 299. Research for the Thesis or Dissertation.** (1-12) Outside research, three to thirty-six 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.

**ME 302. Apprentice Teaching.** (1-4) Seminar, one to four 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.

**PROFESSIONAL COURSE**

**ME 303. Seminar in Physics.** (1) Seminar, one hour. Prerequisite(s): graduate standing. Seminar in selected topics in physics. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**MICROBIOLOGY**

Subject abbreviation: MCBL

David E. Crowley, Ph.D., Program Director
Program Office, 1151 Batchelor Hall
(800) 735-0717 or (909) 787-5688
microbiology.ucr.edu

**Professors**

Michael Allen, Ph.D. Biology and Ecology Microbial-Plant-Soil Interactions (Plant Pathology)

Nancy E. Beckage, Ph.D. Molecular Host-Parasite/Pathogen Interactions (Entomology/Cell Biology and Neuroscience)

Michael D. Coffey, Ph.D. Phytophthora Taxonomy and Genetics (Plant Pathology)

Donald A. Cooksey, Ph.D. Bacterial Copper Resistance (Plant Pathology)

David E. Crowley, Ph.D. Rhizosphere Microbiology; Bioremediation (Environmental Sciences)

J. Allen Dodds, Ph.D. Molecular Virus-Host Interactions (Plant Pathology)

Brian A. Federici, Ph.D. Molecular Biology of Insect Pathogens (Entomology)

Dennis D. Focht, Ph.D. Bacterial Metabolism of Xenobiotics (Plant Pathology)

William T. Frankenberger, Ph.D. Microbial Transformation of Metals and Metalloids (Environmental Sciences)

Sanjeet S. Gill, Ph.D. Bacterial Toxin Action (Cell Biology and Neuroscience)

Bradley C. Hyman, Ph.D. Mitochondrial DNA of Yeast and Nematodes (Biology)

John A. Menge, Ph.D. Mycology, Rhizosphere Biology (Plant Pathology)

Ashok Mulchandani, Ph.D. Microbial Engineering, Biosensors, and Biodeterioration (Chemical and Environmental Engineering)

Edward G. Pfister, Ph.D. Host-Parasite Interactions (Neurology/Biology)

Neal L. Schiller, Ph.D. Human Host-Bacterial Pathogen Interactions (Biomedical Sciences)

Michael Stanghellini, Ph.D. Ecology, Epidemiology, and Control of Soil-borne Pathogens (Plant Pathology)

Marylynne V. Yates, Ph.D. Water and Wastewater Microbiology (Environmental Sciences)

**Professors Emeriti**

Salomon Bartnicki-Garcia, Ph.D. (Plant Pathology)

Irwin W. Sherman, Ph.D. Host-Parasite Interactions in Malaria (Biology)

**Associate Professors**

James E. Adaskaveg, Ph.D. Biology, Epidemiology, and Ecology of Plant Pathogenic Fungi (Plant Pathology)

Wilfred Chen, Ph.D. Microbial Engineering (Chemical and Environmental Engineering)

Howard S. Judelson, Ph.D. Molecular Genetics of Fungi (Plant Pathology)

A.L.N. Rao, Ph.D. Molecular Plant-Virus Interactions (Plant Pathology)

**Assistant Professors**

Katherine A. Borkovich, Ph.D. Fungal Cell and Molecular Biology (Plant Pathology)

James G. Borneman, Ph.D. Microbial Ecology of Soil-borne Plant Pathogens (Plant Pathology)

Marc Deslusses, Ph.D. Biofiltration and Bioremediation of Pollutants (Chemical and Environmental Engineering)

Shou-Wei Ding, Ph.D. Molecular Biology of Plant Viruses and Gene Silencing (Plant Pathology)

Brian Lanoli, Ph.D. Environmental Microbiology, Extreme Environments, Marine Systems (Environmental Sciences)

Lisa Stein, Ph.D. Environmental Microbiology, Anaerobic Microbiology, Biogeochemistry (Environmental Sciences)

**MAJOR**

The Microbiology program participates in the Biological Sciences major. See separate listing under Biological Sciences, Microbiology Track.

**GRADUATE PROGRAM**

The Graduate Program in Microbiology is an interdisciplinary program with participating faculty from the departments of Biology, Botany and Plant Sciences, Cell Biology and Neuroscience, Entomology, Nematology, Plant Pathology, Environmental Sciences, Division of Biomedical Sciences, and the Bourns College of Engineering. Faculty research interests are concentrated in several disciplines in the areas of basic and applied microbiology. These disciplines include the following:

- The biology, physiology, pathogenesis and genetics of bacterial, fungal, parasite and viral pathogens of animals, humans, insects, and plants, with special emphasis on molecular host–pathogen interactions
- Microbial ecology, soil microbiology and rhizosphere microbiology
- Bacterial transformation/detoxification of metals and xenobiotic chemicals
- Characterization of microbial toxins of insects

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 courses in microbiology: MCBL 201 (Microbial 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.

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.

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, or at the Annual Microbiology Graduate Program Retreat at Lake Arrowhead.

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, three hours. Prerequisite(s): BIOL 005A, BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 009B or MATH 091B, PHYS 002C, PHYS 002C, 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, four hours. Prerequisite(s): BIOL 005A, BIOL 005B; concurrent enrollment in
BIOL 120/MCBL 120/PLPA 120 or consent of instructor; BIOL 121A/MCBL 121A and BIOL 121B/MCBL 121B recommended. 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 120. Stanghellini

MCBL 121A. Microbiology. (4) F,W
Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 051A, BIOL 055B, BIOL 055C, CHEM 0010C or CHEM 011B, CHEM 112C, MATH 099B or MATH 099H, PHYS 002C, PHYS 022C, 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 121A.

MCBL 121B. Microbiology. (4) S
Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 121A/MCBL 121A 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 121B.

MCBL 121L. Microbiology Laboratory. (3) F,W,FS
Lecture, one hour; laboratory, six hours. Prerequisite(s): BIOL 121A/MCBL 121A 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.

MCBL 122. Food Microbiology (4) S
Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 121A/MCBL 121A 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, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 051A, BIOL 055B, BIOL 055C, or CHEM 011B, CHEM 112C, MATH 099B or MATH 099H, PHYS 002C, PHYS 022C, 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 197. Research for Undergraduates. (1-4)
Directed research, three to twelve 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 201. Microbial Physiology. (3) F
Lecture, three hours. Prerequisite(s): BCH 110A, BCH 110B, BIOL 121A/MCBL 121A; or equivalents; or consent of instructor. An in-depth coverage of bacterial and fungal structure and function. Specific topic areas include: biosynthesis and composition of major microbial structures; functional analysis of cell surface components; growth, morphogenesis, differentiation, and reproduction; microbial adaptation to environmental influences. Stein

MCBL 211. Microbial Ecology. (3) S, Odd Years
Lecture, three 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

MCBL 216. Biodegradation of Xenobiotic Chemicals. (3) S
Lecture, three hours. Prerequisite(s): BCH 100, BIOL 121A/MCBL 121A, BIOL 121L/MCBL 121L; or equivalents. Explores the importance of microorganisms in metabolizing synthetic organic chemicals. Topics include ecology, physiology, growth, isolation, and identification of degradative bacteria; bioremediation processes; and environmentally related problems. Examines studies of catabolic pathways including metabolites, enzymes, genes, and environmental factors. Cross-listed with ENTX 216 and SWSC 216. Focht

MCBL 216L. Laboratory in Biodegradation of Xenobiotic Chemicals. (3) S
Discussion, one hour; laboratory, three hours. Prerequisite(s): BCH 100, BIOL 121A/MCBL 121A, BIOL 121L/MCBL 121L; or equivalents. Covers laboratory methods used for isolation and identification of degradative bacteria and kinetics of growth and metabolism. Examines studies of catabolic pathways, separation, and spectroscopic identification of metabolites. Cross-listed with ENTX 216L and SWSC 216L. Focht

MCBL 221. Microbial Genetics. (4) W
Lecture, three hours; discussion, one hour. Prerequisite(s): BCH 110C; or BIOL 107A; BIOL 102. An in-depth coverage of the genetics of microbes with emphasis on the primary data and the foundation of modern techniques using Escherichia coli and other prokaryotic systems. Topics include genome organization, plasmids, restriction-modification systems, mutation, transposable elements, regulation of gene expression, viruses, recombination, repair, and responses to stress. Cross-listed with BIOL 221. Borkovich

MCBL 241. Special Topics. (2) Lecture, two 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. Course is repeatable. Cross-listed with PLPA 241.

MCBL 250. Seminar in Microbiology. (1-5) Semiar, one 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 290. Directed Studies. (1-6)
Research, three to eighteen 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)
Research, three to eighteen 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)
Research, three to thirty-six 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.

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
部门的活动包括：正式和非正式的音乐会和独奏，以及通过 UC 伯克利的音乐和文化研究，音乐学，艺术史，以及数字艺术。

**Performance** 通过每个学年，音乐和文化活动部赞助了超过 50 个正式和非正式的音乐会和独奏。这些活动包括通过校园演出和巡演。

**Events** 保存超过 50 个正式和非正式的音乐会和独奏。这些活动包括通过校园演出和巡演。

**Career Opportunities** 学生们在 UCR 毕业后，无论是在学术上还是在就业市场上，都有广泛的选择。许多前毕业生进入音乐学院，而其他人则进入研究生院。

**Note** 因为额外的表演课程，音乐主要课程，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 towards the B.A.

**Degree Requirements**

**University Requirements**

见本科课程部分。

**College Requirements**

见本科课程部分。

**Major Requirements**

**Music Major**

音乐专业的学生必须至少选修以下课程：

1. Lower-division requirements (13-15 units plus keyboard proficiency)
   a) MUS 030A, MUS 030B, MUS 030C
   b) Three quarters of MUS 031 or proficiency for MUS 131
   c) Keyboard proficiency

2. Upper-division requirements (63 units plus quarter ensemble)
   a) MUS 112A, MUS 112B, MUS 112C
   b) MUS 130A, MUS 130B
   c) Three quarters of MUS 131 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 world cultures (MUS 121-129)
      (3) One course from the MUS 113-119 series or MUS 191 (E-Z)
      f) Participation in a major ensemble (MUS 160-165, MUS 168/AST 168) each quarter

**Fees** 所有学生在 MUS 080 (E-Z), MUS 081 (E-Z), MUS 180 (E-Z), and MUS 181 (E-Z) 课程中必须支付报名费 (检查与部门办公室确认)。
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 031
   c) ANTH 001, SOC 001, DNCE 005, or DNCE 007

2. **Upper-division requirements (24 units)**
   a) Music courses (39–49 units)
      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 170 (E-Z)/ FVC 170 (E-Z)
      2. Anthropology or Sociology (4–8 units)
      3. English or Film and Visual Culture (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 121-129
   c) Eight (8) units selected from MUS 121-129, 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 Undergraduate Studies section of this catalog for additional information on minors.

**Education Abroad Program**

The Music Department encourages students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California's EAP Web site at www.uocap.ucsb.edu or contact UCR's International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

**GRADUATE PROGRAM**

**Master’s Degree**

The M.A. degree in Music is offered with a specialization in three areas: 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. The musicology option is also offered with a special emphasis on performance and historical performance practice.

**Admission**

Musicianship and composition students must have an undergraduate background, including piano proficiency and musicianship (ear training), equivalent to that of a music major at UCR. 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. Though applicants must provide GRE General Test scores, scores for the music subject area are not required. Prospective students should submit an example of their expository writing. Musical scores or audition tapes should also be submitted where applicable. Entering graduate students in the composition and musicology programs are required to take an advisory examination. Admission to full graduate status is contingent upon the removal of any deficiencies in undergraduate preparation as shown by this advisory examination.

**Plan I (Thesis)**

All tracks in the M.A. are designed with Plan I (Thesis) in mind. The nature of the thesis is determined by the area of study, as outlined below. In exceptional circumstances students who petition to do so are allowed to complete an M.A. under Plan II (Comprehensive Examination) by passing a written examination in their area of special interest in addition to fulfilling all the requirements of their program (except the thesis). All students are required to pass a written comprehensive examination testing knowledge over a broad spectrum of their field of study, and an oral examination.

**Course Work**

Students in all areas take MUS 200 (Music Bibliography). Each area requires in addition a minimum of 40 quarter units of graduate (200 series) or upper-division undergraduate courses (100 series), including 8 units of MUS 290 (Thesis Preparation). With the exception of Javanese Gamelan Ensemble (MUS 168/AST 168), Japanese Taiko Ensemble (MUS 169/AST 169), and Filipino Rondalla Ensemble (MUS 170/AST 170), 4 units of which may contribute to the degree for those enrolled in the Ethnomusicology program, performance courses (MUS 160-181) do not count toward the degree. The courses comprising the remaining required units are disposed differently in each of the three areas as specified below.

1. **Composition**
   a) MUS 201 (Proseminar in the Analysis of Western Music)
   b) MUS 206 (Proseminar in Musicology) or MUS 207 (Pro-seminar in Ethnomusicology)
   c) MUS 135 (Motivic and Linear Compositional Techniques), MUS 137 (Free-style Compositional Techniques), MUS 257 (Seminar in Motivic and Linear Compositional Techniques), and MUS 258 (Seminar in Free Compos-
The requirement can be satisfied either by examination or by enrolling in a course if one is available. Students who have completed four quarters of any language at the university level with a grade of "B" (3.0) or above in the three years before beginning the M.A. program are considered to have satisfied the requirement.

For further information contact the graduate advisor, Department of Music.

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, three hours; discussion, one hour. Fundamentals of music, including notation, rhythm, major and minor scales, intervals, tonality, triads. Includes ear training, sight-singing, and music theory. Open to students who need basic musical literacy. Open to nonmajors and those with no previous musical background.

MUS 002. Introduction to Western Music. (4) Lecture, three hours; discussion, one 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 005. Women in Music. (4) Lecture, three hours; assigned listening, three hours. 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, three hours; discussion, one hour. Prerequisite(s): none. A survey of world music. Emphasis on the cultural impact of media technology on music performance. Course requires five to ten hours each week.

MUS 007. Music in Movies and TV. (4) Lecture, three hours; discussion, one 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 FVC 009.

MUS 008. Popular Music Cultures of the United States. (4) Lecture, three hours; discussion, one 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 014. Popular Musics of the World. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. Introduction to issues surrounding popular and urban musics of the world, focusing on three major geo-cultural 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 ENS 014 and JUR 014.

MUS 030A. Harmony. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): MUS 001 or a passing score on an equivalent examination; concurrent enrollment in MUS 031 or MUS 131. The study of harmony through melodic and rhythmic practices.

UPPER-DIVISION COURSES

MUS 112A. History of Western Music: Middle Ages to 1700. (4) Lecture, three hours; discussion, one 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, three hours; discussion, one 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, three hours; discussion, one 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 114. Opera. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. Study of selected operas from the Western repertory for 1600 to the present.

MUS 116. Music of J. S. Bach. (4) Lecture, three hours; individual study, three 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 Religion. (4) Lecture, three hours per week; fieldwork, twenty hours per quarter; individual research, three hours per week; written work, four hours per week. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. The investigation and evaluation of the musical practices, styles, and functions within the world's religious communities of the past and present. Special attention is devoted to the sources of the musical usages and the connections between the musical practices.

MUS 121. Ethnomusicological Approaches to Music. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Investigation of the path between European and North American ways of knowing and the art and music of the ‘others’ that these epistemologies seek to understand. Material includes philosophical and ethn musico logical texts, ethnographies and case studies.

MUS 124. Music of Asian America. (4) Lecture, three hours; music listening, one hour; individual study, two 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, three hours; extra reading and listening to prepared tapes of music, three 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, three hours; extra reading, three 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, three hours; extra reading, three 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. Cross-listed with ANTH 128; AST 127, DANCE 128, and THEA 176.

MUS 129. Music Cultures of Africa. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An overview of Africa addressing the large culture areas of the continent. Emphasizes African aesthetic. 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, three hours; consultation, one hour. Prerequisite(s): MUS 030A-MUS 030B-MUS 030C; concurrent enrollment in MUS 031 or MUS 131. 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, three hours; consultation, one hour. Prerequisite(s): concurrent enrollment in MUS 031 or MUS 131; MUS 130A. Study of contrapuntal techniques. Analysis of models centering on the eighteenth century, with exercises to develop manipulative skills in tonal counterpoint.

MUS 131. Musicianship II. (1) Laboratory, two to three; individual study, one hour. Prerequisite(s): MUS 031. Sight-singing and ear-training laboratory including keyboard harmony. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course may be repeated for a total of 3 units.

MUS 133. Instrumentation. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Investigates the technical and color possibilities of various instruments. Includes sound projects. Consent of instructor. Advanced scoring projects with emphasis on stylistic aspects and relationship of orchestral color to form.

MUS 135. Linear and Motivic Compositional Techniques. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): MUS 030C or consent of instructor. Develops compositional skills through a series of graded exercises focusing upon motivic manipulation. Includes collective discussion of compositional solutions. Weekly exercise sets and a final project are required. Course is repeatable to a maximum of 12 units.

MUS 136. Jazz Theory. (4) Lecture, three hours; extra reading and listening to music tapes, three hours. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; 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. Freestyle Compositional Techniques. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Assists the student in the successful composition of pieces in a variety of genres and media. Topics include 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, three hours; assigned special projects, three hours. Prerequisite(s): MUS 030A, MUS 030B, MUS 030C; or consent of instructor. Advanced approaches to analysis using works in contrasting styles. Study of the dynamic design produced by the musical elements functioning in context.

MUS 139. Basic Electronic and Computer Music Composition. (4) Lecture, three hours; studio, two to three hours. Prerequisite(s): MUS 030A or MUS 030B or MUS 030C (may be taken concurrently). Explores the theory and techniques of electronic and computer composition. Topics include basic electronics and acoustics, synthesizer modules, and the use of appropriate music software. Students complete weekly compositional and technical projects in the electronic and computer music studio.

MUS 140. American Musical Subcultures: A Genealogy of Rock. (4) Lecture, three hours; extra reading, zero to two hours; listening, two to three 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 150A. Instrumental Technique: Strings. (2) Lecture, two 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, two hours. Prerequisite(s): upper-division standing or consent of instructor. Study of techniques of orchestral brass instruments.

MUS 150C. Instrumental Technique: Brass. (2) Lecture, two hours. Prerequisite(s): upper-division standing or consent of instructor. Study of basic techniques of orchestral percussion instruments.

MUS 151. Orchestral Conducting. (4) Lecture, three hours; studio, two to three 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, three hours; studio, two to three hours. Prerequisite(s): consent of instructor. Study of choral repertoire, rehearsal methods, voice production, and techniques of conducting.

MUS 160. Orchestra. (1-2) Studio, two to six hours. Prerequisite(s): consent of instructor. Study and performance of standard orchestral literature. Normally graded Satisfactory (S) or No Credit (NC) only, 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, two to six hours. Prerequisite(s): consent of instructor. Study and performance of Medieval, Renaissance, and Baroque music. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for letter grade on basis of assigned extra work or examination. May be repeated for credit.

MUS 162. Choral Society. (1-2) Studio, two to six hours. Prerequisite(s): consent of instructor. Study and performance of Medieval, Renaissance, and Baroque music. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for letter grade on basis of assigned extra work or examination. May be repeated for credit.

MUS 163. Chamber Singers. (1-2) Studio, two to six hours. Prerequisite(s): consent of instructor. Study and performance of standard choral literature. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for letter grade on basis of assigned extra work or examination. May be repeated for credit.

MUS 164. Jazz Ensemble. (1-2) Studio, two to six hours. Prerequisite(s): consent of instructor. Study and performance of works selected from different musical periods and styles. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for letter grade on basis of assigned extra work or examination. May be repeated for credit.
performance of literature for large jazz ensemble and stage band, and preparation of improvised solos.

Normally graded Satisfactory (S) or No Credit (NC) only, 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, two to six hours. Prerequisite(s): consent of instructor. Study and performance of literature for the concert band. Normally graded Satisfactory (S) or No Credit (NC) only, but students may petition the instructor for a letter grade on the basis of assigned extra work or examination. Course is repeatable.

MUS 166. Chamber Music. (2) Studio, two to six hours. Prerequisite(s): admission by audition. Study and performance of chamber music. Open to all instrumentalists at intermediate or advanced performance levels. Normally graded Satisfactory (S) or No Credit (NC) only, 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 167. Recital. (1-2) Rehearsals, six to twelve. Prerequisite(s): approval of music faculty; limited to advanced performers only. Preparation and presentation of a formal recital. Graded Satisfactory (S) or No Credit (NC) only.

MUS 168. Javanese Gamelan Ensemble: Beginning. (2) Studio, six hours. Prerequisite(s): upper-division standing or 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) only, 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, two hours. Prerequisite(s): upper-division standing or consent of instructor. Study and performance of Japanese drumming. Normally graded Satisfactory (S) or No Credit (NC) only, 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, two to four 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, two to four 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, three 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 180 (E-Z). Private Instruction: Voice, Keyboard, and Strings. (2) Studio, one hour; individual practice, five to ten 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. Undergraduate students receive letter grades only; graduate students receive Satisfactory (S) or No Credit (NC) grades only. Course is repeatable.

MUS 181 (E-Z). Private Instruction: Brass, Woodwinds, Percussion, and Other Instruments. (2) Studio, one hour; individual practice, five to ten hours. Prerequisite(s): upper-division or graduate standing in Music. Offered as demand indicates. E. Trumpet; F. Trombone; G. French Horn; H. Flute; I. Oboe; J. Clarinet; M. Bassoon; N. Saxophone; O. Recorder; P. Percussion; Q. Rondalla instruments. Undergraduate students receive letter grades only; graduate students receive Satisfactory (S) or No Credit (NC) grades only. Segments are repeatable.

MUS 186. Jazz: A Social and Cultural History. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the development of jazz from the late 1800s through the 1950s, taking into account its sources in the black religious tradition dating back to slavery. The place of the work song and Negro Spiritual is examined. The role of dance and the influence of parades, processions, and funerals on the development of jazz is investigated. Cross-listed with HIS 136.

MUS 189. ArtsBridge. (1-4) Workshop, five hours per quarter; consultation, five hours per quarter; extra preparation or extra reading, three hours per week; field work, one and half hours to six hours per week. Prerequisite(s): consent of instructor; demonstrated ability or knowledge in the practice and production of the arts. Advanced assignments in K-12 arts outreach along with workshops to explore the pedagogical requirements for and teaching techniques to be used by ArtsBridge scholars. For information on the ArtsBridge program see department. Course is repeatable to a maximum of 16 units. Cross-listed with AIS 189, ART 189, CRWT 189, DNGE 189, and THEA 189.

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.

MUS 191 (E-Z). Seminar in Music. (4) Seminar, three hours; individual study, three 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. Interpretations 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 198-1. 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. Course will be graded Satisfactory (S) or No Credit (NC) only. May be repeated to a total of 16 units.

MUS 1994. Senior Honors Research. (1-5)


MUS 201. Proseminar in the Analysis of Western Music. (4) Seminar, three hours; individual guided research, three hours. Prerequisite(s): graduate standing. Analysis of selected musical works from various periods exploring different music-theory models.

MUS 204. Proseminar in Musicology. (4) Lecture, three hours; consultation, one 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 207. Proseminar in Ethnomusicology. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing. Explores ethnomusical theories, focusing on the relationships between ethnomusicology and musicology, and on ethnomusicology as an interdisciplinary field drawing on performance studies, ethnoeminicism, postmodernism, translational theories, and postcolonialism.

MUS 250 (E-Z). Seminar in Music Theory. (4) Seminar, three hours; research, three hours. Prerequisite(s): MUS 200 and MUS 201 or consent of instructor. Historical study of the theory of western music. F. History of Theory; G. Neo-Classicism; H. Twentieth Century Theorists. I-Z. topics to be announced.

MUS 252. Music Transcription, Analysis, and Representation. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): MUS 207, graduate standing, or consent of instructor. Comparison of different techniques, methodologies, and ideologies of music transcription, analysis, and representation. By viewing notation as a cultural artifact, students consider the implicit biases and cultural values that are perpetuated through music transcription. Weekly transcription assignments and a final project are required.

MUS 255. Field Methods in Ethnomusicology. (4) Seminar, three hours; outside research, one hour; field, two 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. Interviewing, audiotoyping, videotaping, transcribing music and dance, and describing performance events are covered. Cross-listed with ANTH 255.

MUS 257. Seminar in Linear and Motivic Composition. (4) Seminar, three hours; individual study, three hours. Prerequisite(s): MUS 207; graduate standing or consent of instructor. Individual projects and issues in musical composition. Student construct compositions, explore the relationships each others solutions. Course is repeatable to a maximum of 12 units.

MUS 258. Seminar in Free Composition. (4) Seminar, three hours; consultation, one hour. Prerequisite(s): graduate standing or consent of instructor. Develops compositional skills through a series of graded exercises focusing upon motivic manipulation. Includes collective discussion of compositional solutions. Weekly exercise sets and a final project are required. Students construct composition exercises and critique each others solutions. Course is repeatable to a maximum of 12 units.

MUS 261. Seminar in Performance Practice. (4) Seminar, three hours; consultation, one 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 6 units.

MUS 262 (E-Z). Seminar in Western Music History. (4) Seminar, three hours; individual study, three
NEM 120. Soil Ecology. (4) Lecture, two hours; discussion and demonstration, one hour. Prerequisite(s): BIOL 005A and BIOL 005B, or BIOL 002 and BIOL 003. Examination of soil biota and their relationships with plants and the soil environment. Emphasis on soil biotic interactions that influence soil fertility, plant disease, and plant growth. The importance of the different microbial and fungal groups is examined from the rhizosphere to the ecosystem level.
Crowley, Deley

NEM 159. Biology of Nematodes. (3) Lecture, two hours; discussion and demonstration, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C, or CHEM 011BC, CHEM 112C, MATH 099B or MATH 099H, PHYS 002C, PHYS 012C, 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. Deley, Platzer

NEM 190. Special Studies. (1-4) Individual study, three to twelve 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, three to twelve 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. Course is repeatable.

NEM 205. Identification of Plant Parasitic Nematodes. (1) Lecture, five hours; laboratory, twenty-five 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) Lecture, one hour; laboratory, three 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. Baldwin, Roberts

NEM 226. Nematode Taxonomy and Comparative Morphology. (4) Lecture, two hours; laboratory, six hours. Prerequisite(s): consent of instructor. The taxonomy and comparative morphology of soil plant-parasitic nematodes is studied from the ancient to the modern species, with emphasis on the evolutionary development of key features and relationships within the order and higher classification. Course is repeatable.
asitic, and aquatic nematodes. Emphasis on the Tylenchida, their importance, distribution, phylogeny, and speciation. Baldwin

**NEM 227. Molecular Nematology, (2) W, Odd**

Lecture, two hours. Prerequisite(s): graduate standing or consent of instructor. A review of contemporary molecular plant nematology. Topics include genetics, identification, plant disease resistance, and bioengineering resistance. Discusses the use of *Caenorhabditis elegans* as a model system for plant nematodes. Cross-listed with PLPA 227. Kaloshian

**NEM 240. Field Nematology. (1) F Lecture, one hour.**

Prerequisite(s): NEM 206/PLPA 206. Six-day demonstration and field course study in applied nematology including diagnosis and prediction of nematode field problems, strategies for control, field plot design and establishment in association with diverse California crops. Graded Satisfactory (S) or No Credit (NC). McHenry

**NEM 250. Seminar in Nematology. (1) Seminar, one 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. McHenry

**NEM 260. Current Research in Plant Pathology and Nematology. (1) Seminar, one hour.**

Prerequisite(s): graduate status. Topics in plant pathology and nematology 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). Cross-listed with PLPA 260.

**NEM 290. Directed Studies. (1-6)**

Graded Satisfactory (S) or No Credit (NC). 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. McHenry

**PLPA 227.**

*Caenorhabditis elegans* as a model system for plant nematodes. Cross-listed with NEM 227.

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**NEUROSCIENCE**

**UNDERGRADUATE MAJOR**

Subject abbreviation: CBNS

B. Glenn Stanley, Ph.D., Committee Chair
College of Humanities, Arts, and Social Sciences
(909) 787-5386
1419 Life Sciences Psychology
College of Natural and Agricultural Sciences
(909) 787-4186
1001 Batchelor Hall North
psych.ucr.edu/neurowww/neuroidx.html

Committee in Charge
Michael E. Adams, Ph.D. (Cell Biology and Neuroscience/Entomology)
John H. Ashe, Ph.D. (Cell Biology and Neuroscience/Psychology)
Curt Burgess, Ph.D. (Psychology)
Christine Chiarello, Ph.D. (Psychology)
Margarita Currás-Collazo, Ph.D. (Cell Biology and Neuroscience)
Scott N. Currie, Ph.D. (Cell Biology and Neuroscience)
Glenn I. Hatton, Ph.D. (Cell Biology and Neuroscience)
Peter W. Hickmott, Ph.D. (Psychology)
B. Glenn Stanley, Ph.D. (Cell Biology and Neuroscience/Psychology)
Raphael Zidovetzki, Ph.D. (Cell Biology and Neuroscience)
Patricia O’Brien, Ph.D. (Dean, College of Humanities, Arts, and Social Sciences, ex officio)
Steven R. Angle, 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. The Neuroscience major 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 neurobiology, neurophysiology, and neurochemistry in humans and other animals; neural mechanisms underlying sensory system function and perception; neural mechanisms 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 Biological Sciences Undergraduate Advising Center. Breadth requirements vary by college; and students must fulfill the breadth requirements of the college they choose.

For more information about student advising or requirements for admission to professional and technical schools, contact the Biological Sciences Undergraduate Advising Center. Breadth requirements vary by college; and students must fulfill the breadth requirements of the college they choose.

Career Opportunities

The Neuroscience major provides preparation for a variety of careers including those involving laboratory and field work. The major can lead to graduate studies in physiological and behavioral sciences, which contact the Biological Sciences Undergraduate Advising Center; (909) 787-4186, or the Department of Psychology, (909) 787-5386, University of California, Riverside, Riverside, CA 92521.

**Degree Requirements**

**University Requirements**

See the Undergraduate Studies section for requirements that all students must satisfy.

**College Requirements**

College breadth requirements vary depending on which college is chosen to award the degree. For a detailed list of breadth requirements and a summary of units, see the Undergraduate Studies 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. PHIL 134 and PHIL 137 are recommended.

**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 breadth requirement.

**Foreign Language**

In fulfilling the Foreign Language breadth requirement, for both the B.A. and the 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 fulfilling 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 (65–70 units; satisfies the Natural Sciences and Mathematics Major Requirements)**

   - a) BIOL 005A, BIOL 051A, BIOL 005B, BIOL 005C (BIOL 002 and BIOL 003 may be substituted for BIOL 005A, BIOL 051A, and BIOL 005B with advisor’s approval.)
   - b) PSYC 011 or STAT 040 or STAT 100A or CHM 014
   - c) MATH 009A or MATH 009HB or MATH 009C
   - d) CHEM 001A (or CHEM 01HA), CHEM 112, CHEM 112A, CHEM 112B
   - e) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 002LA, PHYS 002LB, PHYS 002LC, or PHYS 040A, PHYS 040B, PHYS 040C
   - f) BCH 100 or BCH 110A

2. **Upper-division requirements**
   - a) **First Tier (13-14 units)**
     1. CHEM 101A, CHEM 101B, CHEM 101C
     2. CHEM 112A, BIOL 105, CHEM 112B, BIOL 106, CHEM 112C
     3. CHEM 112D, CHEM 112B
     4. BIOL 105, BIOL 105A, BIOL 105B
     5. BIOL 106, BIOL 106A, BIOL 106B
     6. BIOL 106C
     7. BIOL 106D
     8. BIOL 106E
   - b) **Second Tier (at least 12 units for the B.A. or at least 20 units for the B.S.)**
     1. BIOL 176, BIOL 177, BIOL 178, CHEM 112A, CHEM 112B, CHEM 112C
     2. CHEM 112D, CHEM 112B, CHEM 112C
     3. CHEM 112D
     4. CHEM 112D
     5. CHEM 112D
     6. CHEM 112D
     7. CHEM 112D
     8. CHEM 112D
   - 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, First Tier, or 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.

**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**

<table>
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<tr>
<th>Freshman Year</th>
<th>Fall</th>
<th>Winter</th>
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**Bachelor of Science**

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<th>Freshman Year</th>
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<td>CHEM 112A, CHEM 112B, CHEM 112C</td>
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<td>General Physics</td>
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<td>General Physics Lab</td>
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<td>Humanities/Social Sciences</td>
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</tr>
<tr>
<td>Total Units</td>
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</table>

**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 (13–14 units)**
   - a) CBNS 106
   - b) CBNS 120/PSYC 120
   - c) CBNS 120/PSYC 120 or BIOL 176L
   - d) CBNS 124/PSYC 124

2. **Second Tier (6–7 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 176, BIOL 177, BIOL 178; BIOL 176L or CBNS 120/PSYC 120L (whichever was not used under 1, above); CBNS 101, CBNS 116, CBNS 121, CBNS 125/PSYC 125, CBNS 126/PSYC 126, CBNS 127/PSYC 127; PSYC 129

Descriptions for all courses used in the Neuroscience major and minor may be found in the appropriate department section.

**Teaching Credential**

Teachers in the public schools in California must be certified 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. The latter usually requires three quarters and includes education courses and supervised teaching.

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, preferably, by completing an undergraduate program that is state-approved for teacher preparation.

UCR has an approved undergraduate program for Neuroscience 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.

UCR does not have a state-approved undergraduate program for Neuroscience majors who wish to teach at the secondary level. The Teaching Credential in Science, biology emphasis, is required for biology 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. This is more easily accomplished with a Biology rather than a Neuroscience major. The examination includes biology 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, the Biological Sciences Undergraduate Advising Center (1001 Batchelor Hall North), and the Graduate School of Education (1124 Sproul Hall).

NEUROSCIENCE GRADUATE PROGRAM

Subject abbreviation: NRSC

B. Glenn Stanley, Ph.D., Director
Program Office, 1151 Batchelor Hall
(909) 787-4419; (800) 735-0717
neuro.ucr.edu

Professors
Michael E. Adams, Ph.D.
(Cell Biology and Neuroscience/Entomology)
G. John Anderson, Ph.D. (Psychology)
John H. Ashe, Ph.D.
(Cell Biology and Neuroscience/Psychology)
Richard A. Cardullo, Ph.D. (Biology)
Christine Chiarello, Ph.D. (Psychology)
Glenn I. Hatton, Ph.D.
(Cell Biology and Neuroscience)
Werner G. Kuhr, Ph.D. (Chemistry)
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
Curt Burgess, Ph.D. (Psychology)
Margarita C. Carras-Gollazo, Ph.D.
(Cell Biology and Neuroscience)
Scott N. Carrier, Ph.D.
(Cell Biology and Neuroscience)
Manuela Martins-Green, Ph.D.
(Cell Biology and Neuroscience)

Assistant Professors
Douglas W. Ethell, Ph.D. (Biomedical Sciences)
Iryna M. Ethell, Ph.D. (Biomedical Sciences)
Peter W. Hickmott, Ph.D. (Psychology)
Gene Huh, Ph.D. (Cell Biology and Neuroscience)
Vladimir Popara, M.D., Ph.D.
(Cell Biology and Neuroscience)

The multidisciplinary interdepartmental graduate program in Neuroscience offers instruction and research training leading to the Ph.D. degree. 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 —

- Physiological actions of ion channel toxins
- Modulation of ion channels by neurotransmitters and hormones
- Synaptic transmission and neural plasticity in mammalian nervous systems
- Signal transduction in excitable cells
- Ionic interrelationships and the process of exocytosis
- 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
- Cerebral hemisphere asymmetries and hemispheric interaction
- Development of chemical sensors for real-time measurement of chemical dynamics in the brain
- Regulation of genes specifying neuronal connections in developing and mature nervous systems
- Astrocyte–neuron signaling
- Molecular mechanisms that trigger dendritic spine formation

Areas involving behaviors and diseases include —

- Neural control of eating behaviors
- Neural basis of language and reading
- Neural networks controlling locomotion in the spinal cord and brainstem
- Neurolinguistics
- Computational models of high-dimensional memory
- Mechanisms of neuronal death in Alzheimer’s disease, stroke, and other disorders

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.). Applicants 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; Behavioral Biology; Learning and Memory; Perception; Computer Science; and Neuroscience, Neurobiology, or Physiological Psychology, with laboratory.

Doctoral Degree

Core requirements include:

1. NRSC 200A/PSYC 200A, NRSC 200B/PSYC 200B, NRSC 200C/PSYC 200C

2. One Research Methods course selected from CHEM 125, CHEM 221A, CHEM 221B, CHEM 221C, CHEM 221D, NRSC 211, PSYC 211, PHYS 139L

3. Two courses or one course sequence selected from the following: BCH 110A, BCH 110B, BCH 110C, BCH 241/CHME 241, BIOL 177, BIOL 200/CMBD 200, BIOL 201/CMBD 201, BIOL 203, BMSC 210A, BMSC 210B, BMSC 220, ENTM 206 and ENTM 206L, 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.

4. During each quarter in academic residence every student enrolls and participates in the Colloquium in Neuroscience (NRSC 257 or NRSC 287), and, until passing the oral qualifying examination, every student takes at least two seminars, Special Topics in Neuroscience (NRSC 289, 2 units), 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 are required to 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 is required to submit a written dissertation proposal to the dissertation committee for 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, three 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 PSY 200A.

NRSC 200B. Fundamentals of Neuroscience. (3) Lecture, three hours. Prerequisite(s): graduate standing or consent of instructor, NRSC 200A/PSY 200A. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSY 200B.

NRSC 200C. Fundamentals of Neuroscience. (3) Lecture, three hours. Prerequisite(s): graduate standing or consent of instructor. NRSC 200A/PSY 200A. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with PSY 200C.

NRSC 211. Selected Techniques in Microscopy. (5) Lecture, three hours; laboratory, six hours. Prerequisite(s): CINS 101; second-year standing in a graduate program recommended. Concerned with the experimental analysis of cells and cellular components. Introduces the principles of light and transmission electron microscopy with applications to cell biology. Emphasizes sample preparation and the use of electron microscopy, but also illustrates the use of other kinds of microscopy. Laboratory work includes projects and techniques of special interest to the student.

NRSC 287. Colloquium in Neuroscience. (1) Colloquium, one hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports on current research topics in neuroscience with presentations by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 287, BIOL 287, BMSC 287, CHEM 287, and PSYC 287.

NRSC 289. Special Topics in Neuroscience. (2) Seminar, two 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. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 289, BIOL 289, BMSC 289, CHEM 289, ENTM 289, and PSYC 289.

NRSC 290. Directed Studies. (1-6) Individual study, three to eighteen 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. (1-4) Outside research, three to eighteen 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, three to thirty-six 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.

PEST MANAGEMENT

Subject Abbreviation: PSMT

The M.S. program in Pest Management is not currently accepting new students. Address inquiries to the Department of Entomology, 146A Entomology, or call (909) 787-5621.

PHILOSOPHY

Subject abbreviation: PHIL

Georgia Warnke, Ph.D., Chair
Department Office, 1604 Humanities and Social Sciences; (909) 787-5208
philosophy.ucr.edu

Professors
Carl F. Cranor, Ph.D.
John M. Fischer, Ph.D.
David K. Gildean, Ph.D.
Bernd Magnus, Ph.D.
Andrew Reath, Ph.D.
Georgina Warnke, Ph.D.
Gary Watson, Ph.D.
Howard K. Wettstein, Ph.D.
Larry Wright, Ph.D.

Professor Emeritus
David Harrah, Ph.D.

Associate Professors
Paul D. Hoffman, Ph.D.
Pierre Keller, Ph.D.
Erich Reck, Ph.D.

Assistant Professors
William Bracken, Ph.D.
Peter J. Graham, Ph.D.
Eric Schwenk, Ph.D.

MAJORS

The Department of Philosophy offers a major and minor in Philosophy and a major in Philosophy/Law and Society.

The major in Philosophy 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 B.A. degree in Philosophy/Law and Society 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.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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.


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 Department 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. Requirements for Law and Society (36 units)
   a) PHIL 007 or PHIL 007H
   b) LWSO 100
   c) One course chosen from the following list: ECON 111, PSYC 012, SOC 110A, POSC 114 (or equivalent course in research methods)
   d) Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159 (One of these courses may be replaced by a substitute choice from a list of courses published annually by the Law and Society Faculty Committee. Not more than two of the courses taken to meet this requirement [2.d] may be from the same department.)
   e) LWSO 193, Senior Seminar

**Note** 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/PSYC 154
3. Philosophy and the Natural Sciences: PHIL 117, PHIL 130, PHIL 134, PHIL 137, PHIL 140, PHIL 151, PHIL 167

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

**GRADUATE PROGRAM**

Domestic applicants to graduate programs in the Department of Philosophy must supply GRE scores for the aptitude tests. All applicants must submit a writing sample.

**Master's Degree**

The master's program in Philosophy follows Plan 1 (Thesis). Upon admission to the program, students are assigned a committee of three advisors. Students consult with the graduate advisor and their advisory committees twice a year in September and January to determine their individual course of study. In addition, all students must have their programs signed by the graduate advisor.

Students should note that although they need not have completed distributional requirements or a language requirement to acquire the M.A. degree, there are strict distributional and language requirements for the Ph.D. degree. M.A. 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.

In addition, students must

1. Complete, with a grade of “B” or better, course work totaling 38 units of graduate credit in philosophy, of which at least 24 must be at the graduate level. Of these
   a) Twelve (12) units must be in the three proseminars for first-year graduate students. (The proseminars are designed to acquaint first-year students with the current state of discussion in a given subfield and also to equip them with the elementary tools needed to conduct their own research.)
   b) Up to 20 units may be in the 100-series courses or 230–266 series, depending on the student's interests and background. These are to be chosen only in consultation with the student's advisory committee and the graduate advisor.

2. Satisfy the logic M.A. requirements. Students must take PHIL 124 (Formal Logic) before the end of their sixth quarter and pass it with a grade of “B” or better. Students who fail to pass on the first try have a second, and final, opportunity to take PHIL 124.

Since some entering graduate students may have a background in logic beyond the introductory level, the department offers an examination to the entering class on the day before the beginning of fall quarter (if classes start on a Monday, the exam is offered the previous Friday). For those students who perform satisfactorily on the test, the requirement for the M.A. is considered fulfilled. Students who are unsure about the adequacy of their background are encouraged to take the test for diagnostic purposes. Those who wish to take the test but are unable to attend should contact the graduate advisor prior to the date of the exam.

3. Submit a “professional paper” of 25 pages or less (normally a high-quality seminar paper) for oral examination and approval. Further information on what constitutes a professional paper is available from the graduate advisor. Students must consult with the advisor in selecting an M.A. committee. Failure after two opportunities to pass the M.A. oral constitutes grounds for dismissal from the program. In addition, completion of the M.A. requirements does not guarantee admission to the Ph.D. program.

**Doctoral Degree**

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 their advisory committee in consultation with the graduate advisor. A student's course of study is supervised by an advisory committee, in consultation with the graduate advisor until the student receives a dissertation committee. Under certain circumstances, holders of the master's degree in Philosophy from other universities may be admitted to the doctoral program. These students are required to enroll in first-year proseminars.

**Course Requirements** Ph.D. students are required to 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, 8 units in addition to the proseminar must be in the area of the history of philosophy; with 4 of these in ancient philosophy, 8 in addition to the proseminar in the area of metaphysics and epistemology, and 8 in addition to the proseminar in the area of ethics, politics, and aesthetics.

Language Requirement A student must know one foreign language well enough to conduct philosophical research in that language. Students may select Greek, Latin, French, German, or (by petition) some other language if it accords better with the area of their research. Competence is judged by a translation exam administered by the department.

Logic Requirement To satisfy the logic requirement, students must pass PHIL 125 (Intermediate Logic) with a grade of “B” or better.

Proposition Requirement Having acquired an M.A. degree either here or at another institution, all Ph.D. students must complete an acceptable proposition by the end of their first year in the Ph.D. program. A proposition is a paper, no more than forty pages in length, devoted to a significant problem in philosophy.

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, three hours; discussion, one hour. Prerequisite(s): none. An introductory exploration into the nature of the individual, 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, two hours; discussion, one hour, extra reading, three 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, two hours; discussion, one hour; consultation, one 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, 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 002H. Honors Contemporary Moral Issues. (4) Lecture, two hours; discussion, one hour; extra reading, three 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 007. Introduction to Critical Thinking. (4) Lecture, two hours; discussion, one hour. Prerequisite(s): none. A practical analysis 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, two hours; discussion, one 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 007 or PHIL 007H.

PHIL 008. Introduction to Logic. (4) Lecture, three hours; discussion, one 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. Satisfactory (S) or No Credit (NC) grading is not available. Credit is only awarded for one of PHIL 008 or PHIL 008H.

PHIL 008H. Honors Introduction to Logic. (4) Lecture, three hours; discussion, one 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 to use logical 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 012. Introductory Seminar in Moral Philosophy. (4) Seminar, three hours; extra reading, two hours; term paper. Prerequisite(s): none. An introduction to a small number of central moral issues: Social class size in order to provide for substantial discussion and close supervision of written papers.

PHIL 020 (E-Z). Introduction to the History of Philosophy. (4) Lecture, three hours; extra reading, three hours. 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; E. 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, three hours; term paper, three 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. Issues include

PHIL 108. Philosophical Issues of Race and Gender. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, three 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, three hours; screening, one hour; extra reading, two 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on aspects of our distinctively human capacity to lead a meaningful life, especially in the light 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, three hours; extra reading, three 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, ideas, and values, and the riddle of the after-life.

PHIL 114. Science and Human Understanding. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): one course in philosophy or consent of instructor. A study of some recent philosophical reflections on this topic; that is, the ways in which contemporary philosophers have examined human understanding as exemplified in science.

PHIL 115. The Care of the Soul. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An 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, three hours; discussion, one 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, three hours; extra reading, three 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; three hours; extra reading, three 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 identical 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; three hours; individual study, three hours. Prerequisite(s): ECON 0003 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; epistemology and the philosophies of science of Popper, Kuhn, and others. Cross-listed with ECON 117.

PHIL 120 (E-Z). Ancient Philosophy. (4) Lecture; three hours; extra reading, three hours. Prerequisite(s): one course in philosophy or consent of instructor. Each segment covers a major figure in the history of 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; three hours, extra reading, three 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; U. Russell; V. Wittgenstein; X. Kripke. Credit is awarded for only one of PHIL 121 (E-Z) or PHIL 221 (E-Z).

PHIL 122 (E-Z). Topics in History of Philosophy. (4) Lecture; three hours, extra reading, three 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. Phenomenology; O. Kant and Post-Kantian European Moral Philosophy; Q. Political Philosophy. Credit is awarded for only one of PHIL 122 (E-Z) or PHIL 222 (E-Z).

PHIL 124. Formal Logic. (4) Lecture; three hours, extra reading, two hours; term paper, one hour. Prerequisite(s): PHIL 008 or consent of instructor. An introduction to first-order logic, that is, the core of the logic often used in contemporary philosophy, mathematics, and computer science; supplemented with an introduction to some elementary set-theory.

PHIL 125. Intermediate Logic. (4) Lecture; three hours; extra reading, two hours; term paper, one hour. Prerequisite(s): PHIL 125 or consent of instructor. The basic metaphysics 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; three hours, extra reading, two hours; term paper, one hour. Prerequisite(s): PHIL 126. 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 130. Theory of Knowledge. (4) Lecture; three hours; extra reading, three hours. Prerequisite(s): one course in philosophy or consent of instructor. An inquiry into the nature—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; three hours; extra reading, three hours. Prerequisite(s): one course in philosophy or consent of instructor. A discussion of major thinkers 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; three hours; extra reading, three 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; three hours; extra reading, three 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 the indeterminism of 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; three hours; extra reading, three hours. Prerequisite(s): one course in philosophy or consent of instructor. A study of several theories of the 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; three hours; extra reading, three hours. Prerequisite(s): one course in philosophy or upper-division standing in Psychology or consent of instructor. Examines philosophical issues arising in the context of conceptual psychology. Topics may include mental 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. Cross-listed with PSY 154. Credit is awarded for only one of PHIL 135/PSY 154 or PHIL 235.

PHIL 136. Reasoning and Rationality. (4) Lecture; three hours; extra reading, three hours. Prerequisite(s): PHIL 007 or consent of instructor. An exploration of the role reasoning plays in our lives, including a study of the linguistic and conceptual issues encountered when everyday reasoning becomes abstract, and reflections on the related philosophical notion of rationality.

PHIL 137. Philosophy of Science. (4) Lecture; three hours, extra reading, three 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. Credit is awarded for only one of PHIL 137 or PHIL 237.

PHIL 139. Philosophy of Mathematics. (4) Lecture; three hours; extra reading, written work, homework problems, three 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; three hours; extra reading, three 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 150. Philosophy in Literature. (4) Lecture; three hours; extra reading, three 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; three hours; extra reading, three 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; three hours; extra reading, three 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; three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the ideas central to the tradition of Western Marxism: ideology, critique, refutation, instrumental reason, the domination of nature, and communicative action. Theorists discussed typically include Hegel, Marx, Lukacs, Adorno, Borkheimer, Benjamin, and Habermas. Credit is awarded for only one of PHIL 153 or PHIL 253.

PHIL 159. Philosophy of Religion. (4) Lecture; three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the major classical moral philosophers in the Western tradition and of some selected problems of metaphysics. Credit is awarded for only one of PHIL 159 or PHIL 259.

PHIL 161. Ethics. (4) Lecture; three hours; extra reading, three 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 metaphysics. Credit is awarded for only one of PHIL 161 or PHIL 261.

PHIL 162. Social Philosophy. (4) Lecture; three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An inquiry into philosophical problems and issues arising out of social theory and practice, focusing on contemporary concerns including the educational system, the family structure, women's liberation, racial conflict, and the problems of violence.

PHIL 163. Political Philosophy. (4) Lecture; three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An inquiry into some of the main philosophical 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; three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the concept of justice. Credit is awarded for only one of PHIL 164 or PHIL 264.

PHIL 165. Philosophy of Law. (4) Lecture; three hours; discussion, one hour; extra reading, three 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 135 or PHIL 235.

PHIL 166. Philosophy of Feminism. (4) Lecture, three hours; extra reading, three 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. Sittes various approaches to these topics in philosophy. Credit is awarded for only one of PHIL 166 or PHIL 266.

PHIL 167. Biomedical Ethics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. A philosophical discussion of newly emerging issues, both ethical and medical, in biology and medicine, such as genetic engineering, sex and gender. Situates various approaches to these topics in philosophy. Credit is awarded for only one of PHIL 167 or PHIL 267.

PHIL 168. Ethics and Families. (4) Lecture, three hours; extra reading, three 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, "traditional" families, 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 WSMT 141.

PHIL 169 (E-Z). Topics in Value Theory. (4) Lecture, three hours; extra reading, three 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 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, three hours; term paper, three 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 repeatable to a maximum of 8 units.

GRADUATE COURSES

PHIL 220 (E-Z). Ancient Philosophy. (4) Lecture, three hours; seminar, one 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, three hours; seminar, one hour. Prerequisite(s): graduate standing. Each 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; U. Russell; V. Wittgenstein; K. 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, three hours; seminar, one 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. 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, three hours; seminar, one 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, three hours; seminar, one 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, three hours; seminar, one hour. Prerequisite(s): graduate standing. A study of some of the traditional issues in the philosophy of language, such as analyticit, theories of reference, truth, speech act theory, and philosophical theories of formal grammar. 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, three hours; seminar, one 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 infinity in 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, three hours; seminar, one 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, three hours; seminar, one hour. Prerequisite(s): graduate standing. Examines philosophical issues arising in the context of scientific 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/PSYC 154 or PHIL 235.

PHIL 237. Science of Philosophy. (4) Lecture, three hours; seminar, one 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 239. Philosophy of Mathematics. (4) Lecture, three hours; seminar, one 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 pain, 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 232. Twentieth-Century Continental Philosophy. (4) Lecture, three hours; seminar, one hour. Prerequisite(s): graduate standing. A study of some of the major classical moral philosophers in the Western tradition dominant in twentieth-century British and American philosophy. Philosophers discussed might 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, three hours; seminar, one 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, three hours; seminar, one 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, three hours; seminar, one 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 263. Political Philosophy. (4) Lecture, three hours; seminar, one hour. Prerequisite(s): graduate standing. An inquiry into some of the main philosophical 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, three hours; seminar, one 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, three hours; seminar, one 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, three hours; seminar, one 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, one 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 275A. Proseminar for First-Year Graduate Students: History of Philosophy. (4) Seminar, three hours; extra reading, three 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 275B. Prosminar for First-Year Graduate Students: Metaphysics and Epistemology. (4) Seminar, three hours; extra reading, three 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 275C. Prosminar for First-Year Graduate Students: Moral Philosophy. (4) Seminar, three hours; extra reading, three 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, three hours; outside research, three 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.

PHIL 281. Philosophical Texts. (4) Seminar, one to three hours; consultation one 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, three hours; outside research, three 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.

PHIL 283. Seminar in Contemporary Philosophy. (4) Seminar, three hours; outside research, three 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 284. Seminar in Continental Philosophy. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers an aspect of continental 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 285. Seminar in Social & Political Philosophy. (4) Seminar, three hours; extra reading, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers an aspect of social and political 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 286. Seminar in Ethics. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing. A study of ethical theory and practice. 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 301. Directed Studies in the Teaching of Philosophy. (1) Seminar, one 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) F,W,S Lecture, three hours; extra reading, three hours. 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 397. Directed Research. (1-6) Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

PHIL 399. Research for Thesis or Dissertation. (1-12) Graded Satisfactory (S) or No Credit (NC). 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 293. Directed Research in Philosophy. (1-6) Prerequisite(s): consent of instructor. Each 293 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.

The Department of Physical Education offers a wide range of activity classes intended to give students the skills and knowledge to embrace a lifestyle that includes physical activity. The department also offers certification classes in first aid, CPR, and lifeguard training, and aquatic instruction.

Intercollegiate Athletic Program

UCR is a Division I university of the National Collegiate Athletic Association (NCAA) and participates in the Big West Conference in 17 sports.

UCR offers eight teams for men interested in participating at the collegiate level: basketball, baseball, cross country, golf, soccer, tennis, and indoor and outdoor track and field. Women’s sports offer nine teams: basketball, cross country, golf, soccer, softball, tennis, indoor and outdoor track and field, and volleyball.

Individuals interested in the program should contact the coach or athletic director. Any of the above sports may be taken for credit.

Recreation and Intramural Sports for Men and Women

The intramural sports programs and the recreational program are both under the direction of the Recreation Coordinator in the Student Recreation Center.
PED 031. First Aid and Cardio-Pulmonary Resuscitation. (1) Lecture, one hour; laboratory, one hour. Current American Red Cross First Aid and Cardio-Pulmonary Resuscitation training. Certification on completion of the course.

PED 032. Lifeguard Training. (1) Lecture, one hour; activity, two hours. An American Red Cross lifeguard training course covering the skills and knowledge required for effective lifeguarding at swimming pools and at nonsurf, open-water beaches.

PROFESSIONAL COURSE

PED 324. The Teaching of Swimming, Diving, Lifesaving and Water Safety. (2) Lecture, two hours; laboratory, two hours to be arranged. Prerequisite(s): PED 025 or consent of instructor. Upon successful completion of the course, a Water Safety Instructor’s Certificate is awarded.

PHYSICAL SCIENCES

The Physical Sciences major is not accepting new students at this time. For more information, contact the College of Natural and Agricultural Sciences, Student Affairs Office, Room 1140 Batchelor Hall, or call (909) 787-7294.

PHYSICS

Subject abbreviation: PHYS

Allen D. Zych, Ph.D., Chair
Ward Beyermann, Ph.D., Vice Chair
Department Office, 3047 Physics
(909) 787-5330: enas.ucr.edu/~physics

Professors
Robert B. Clare, Ph.D.
France A. Gordova, Ph.D.
Bipin R. Desai, Ph.D.
J. William Gary, Ph.D.
Gail G. Hanson, Ph.D.
Ernest S. Ma, Ph.D.
Douglas E. MacLaughlin, Ph.D.
Allen P. Mills, Ph.D.
Umar Mohideen, Ph.D.
Richard K. Seto, Ph.D.
Benjamin C. Shen, Ph.D.
Harry W.K. Tom, Ph.D.
Gordon J. VanDalen, Ph.D.
Stephen J. Wimpenny, Ph.D.
Jose Wudka, Ph.D.
Jory A. Yarmoff, Ph.D.
Gary P. Zauk, Ph.D.
Allen D. Zych, Ph.D.

Professors Emeriti
Leon J. Bruner, Ph.D.
Frederick W. Cummings, Ph.D.
Glen E. Everett, Ph.D.
Sun-Yiu Fung, Ph.D.
Peter E. Kaus, Ph.D.
Anne Kernan, Ph.D.
Nai-I LI Liu, Ph.D.
Donald C. McCollam, Ph.D.
John C. Nickel, Ph.D.
Raymond L. Orbach, Ph.D.
Michael Pollak, Ph.D.
Eugen S. Simanek, Ph.D.
R. Stephen White, Ph.D.

Associate Professors
Ward Beyermann, Ph.D.
John A. Ellison, Ph.D.

Assistant Professors
Kenneth N. Barish, Ph.D.
Roland Kawakami, Ph.D.
Leonid P. Pryadko, Ph.D.
Greg Kenning, Ph.D.
John G. Layter, Ph.D.
Zdenek Sroubek, Ph.D.

PHYS 1140 Batchelor Hall, or call (909) 787-7294.

MAJOR

The Department of Physics 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 Physics Department, 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 modelling 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 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.

Degree 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.

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 the B.A. degrees in Physics are as follows:

1. Lower-division requirements (60 units)
   a) PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, PHYS 040E
   b) MATH 009A, MATH 009B, MATH 009C, MATH 010A, MATH 010B, MATH 046
   c) CHEM 001A, CHEM 001B, CHEM 001C

2. Upper-division requirements (55 units)
   a) PHYS 130A, PHYS 130B, PHYS 134, PHYS 135A, PHYS 135B, PHYS 136, PHYS 156A, PHYS 156B
   b) PHYS 130L, PHYS 142L. An approved senior thesis (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D) in experimental physics or an internship (PHYS 198-1) in experimental physics at a government or industrial laboratory can be used in place of up to 3 units of PHYS 142L.
   c) A student may take up to a maximum of 8 units of undergraduate research in pursuit of a senior thesis (PHYS 195A, PHYS 195B, PHYS 195C, PHYS 195D).
   d) During the junior or senior years, a Physics internship (PHYS 198-1) of up to 12 units can be taken at an approved government or industrial laboratory. A maximum of 4 out of the 12 units may be used to satisfy the major requirements.
   e) Three elective courses to be taken in consultation with a faculty advisor.

Specialized skills can be developed by taking physics electives from the following list:
PHYS 111 (Astrophysics)
PHYS 150 (Solid State Physics)
PHYS 163 (Atomic Physics and Spectroscopy)
PHYS 164 (Nuclear and Particle Physics)
PHYS 177 (Computational Methods)

Students seeking an emphasis in biophysics, 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 140A, MATH 140B, MATH 140C, MATH 165A, MATH 165B, and MATH 113.

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.).

Although no foreign languages are required for the B.S. degree, the student who is planning to proceed to graduate work is reminded that reading proficiency in one or more foreign languages is required in some physics graduate programs.

Sample Program

Bachelor of Science

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<th>Freshman Year</th>
<th>Fall</th>
<th>Winter</th>
<th>Spring</th>
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<td>PHYS 135A, PHYS 135B, PHYS 136</td>
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Senior Year

| PHYS 139A, PHYS 142L | 5 | 3 | 3 |
| PHYS 154A, PHYS 156B | 4 | 4 | 4 |
| Elective | 8 | 8 | 8 |
| **Total Units** | 17 | 15 | 11 |

Bachelor of Arts

For the B.A. degree, additional units are required in Humanities, Social Sciences, and foreign language to meet the breadth requirements.

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

Ongoing research in the Department of Physics 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.

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 (909) 787-5332.

The department is developing an internship program in conjunction with the Los Alamos National Laboratory. Please contact the department for more information.

Master’s Degree

A student is recommended for the degree of M.A. or M.S. in Physics upon completion of the following requirements:

1. 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 of “B” or better.

2. Either of the following two plans:

**Plan I** Satisfactory completion of a thesis in a field of physics to be chosen in consultation with a faculty supervisor. This thesis shall be passed upon by a committee designated by the department. In addition, PHYS 401 is required.

**Plan II** 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.

Doctoral Degree

It is recommended that students in the Ph.D. program become associated with a research advisor by the end 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.

1. Satisfactory performance on a preliminary examination, to be taken at the beginning of the student’s second year. The examination is given once each academic year at the beginning of the fall quarter. A make-up exam is offered at the beginning of the winter quarter.

The preliminary examination consists of:

a) A four-hour written exam that covers Mechanics, and Statistical and Thermal Physics at the undergraduate level; and Quantum Mechanics and Electromagnetism at the graduate level.

b) An oral exam covering the above material and various other areas of general physics.

Following the examination, the department reviews each student’s entire academic performance to recommend a pass at the Ph.D. level, a pass at the M.S. level, or a failure. The examination may be repeated once in the winter quarter following the initial attempt.

2. Completion of the following courses. 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.

Core courses:

- PHYS 205 (Classical Mechanics)
- PHYS 210A, PHYS 210B (Electromagnetic Theory)
- PHYS 212A, PHYS 212B (Thermodynamics and Statistical Mechanics)
- PHYS 221A, PHYS 221B, PHYS 221C (Quantum Mechanics)
- PHYS 401 (Scientific Writing and Illustration)

In addition, at least three elective graduate lecture courses must be completed. The program for each student must be approved by the graduate committee and by 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 and courses in addition to those listed below.

The elective courses include:

a) Nuclear and Particle Physics

- PHYS 230A, PHYS 230B, PHYS 230C (Advanced Quantum Mechanics and Quantum Theory of Fields)
- PHYS 225A, PHYS 225B (Elementary Particles)

b) Condensed Matter, Surface, and Optical Physics

- PHYS 240A, PHYS 240B, PHYS 240C (Solid State Physics)
- PHYS 209A, PHYS 209B (Introduction to Quantum Electronics)
- PHYS 242 (Physics at Surfaces and Interfaces).

c) Astrophysics

- PHYS 211A (Radiative Processes in Astrophysics)
- PHYS 211B (Astrophysical Fluid Dynamics)
- PHYS 208 (General Relativity)
Development of skills in problem solving using physical reasoning, graphical analysis, and basic mathematical techniques. This course is not intended to satisfy any mathematics, physical sciences, or breadth requirements and is intended for students who plan to take PHYS 002A, PHYS 002B, and PHYS 002C.

**PHYS 002A. General Physics.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 009A with a grade of "C-" or better or MATH 09HA with a grade of "C-" or better. For biological sciences students. 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 or PHYS 040A.

**PHYS 002B. General Physics.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 009B or MATH 09HB (may be taken concurrently), and a grade of "C-" or better in PHYS 002A. For biological sciences students. Topics in mechanics, thermodynamics, and electromagnetism including fluid mechanics; temperature and heat; the laws of thermodynamics; kinetic theory of gases; electric fields and potentials; ancient concepts to modern physics principles. Credit is awarded for only one of PHYS 002B or PHYS 040B.

**PHYS 002C. General Physics.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PHYS 002B with a grade of "C-" or better. For biological sciences students. Topics in waves and modern physics including harmonic oscillations; mechanical and electromagnetic waves; geometrical optics; reflection, refraction, interference, diffraction, and polarization; and quantum, atomic, and nuclear physics. Credit is awarded for only one of PHYS 002C or PHYS 040C.

**PHYS 021A. General Physics Laboratory.** (1) Laboratory, three hours. Prerequisite(s): PHYS 020A (may be taken concurrently) and the experimentations 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, three 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, three hours. Prerequisite(s): PHYS 002B 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 002C. Covers the basic principles of oscillations, waves, optics, and radioactivity. Laboratory is helpful, but not required, for PHYS 002C.

**PHYS 07. Space-Time, Relativity, and Cosmology.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. A nontraditional 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 the present day theories on the origin and evolution of the universe. The philosophical ideas, scientific method, historical settings, as well as the intellectual impacts are explored. Demonstrations and visual illustrations. Not open to Physical Science majors.

**PHYS 008. Color and Sound: Dimensions in Communication.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. 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; sound production in speech, music, and high-fidelity audio devices. Demonstrations and illustrations. Not open to students who have taken or are concurrently enrolled in PHYS 002A, PHYS 002B, PHYS 040A, PHYS 040B, PHYS 040C, and PHYS 040D.

**PHYS 020. Exploring the Universe: An Adventure in Astronomy.** (4) Lecture, three hours; workshop, three 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, three hours; workshop, three 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 039. Adventures in Physics.** (2) Seminar, one hour; discussion, one 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, three hours; discussion, one hour; laboratory, three hours. Prerequisite(s): 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 0909 or MATH 09H9B by may be taken concurrently). Designed for engineering and physical sciences students. Special topics such as UFOs and colonization of space are discussed.

**PHYS 040B. General Physics.** (5) Lecture, three hours; discussion, one hour; laboratory, three hours. Prerequisite(s): MATH 009C or MATH 09HC; a grade of "C-" or better in PHYS 040A. 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. Credit is awarded for only one of PHYS 002A or PHYS 040A.

**PHYS 040C. General Physics.** (5) Lecture, three hours; discussion, one hour; laboratory, three hours. Prerequisite(s): MATH 009C or MATH 09HC; a grade of "C-" or better in PHYS 040B. 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 002C or PHYS 040C.

**PHYS 040D. General Physics.** (5) Lecture, three hours; discussion, one hour; laboratory, three hours. Prerequisite(s): a grade of "C-" or better in PHYS 040C 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. Laboratory projects provide an opportunity to experimentally establish the foundations of physical principles and selected applications.

PHYS 040E. General Physics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): a grade of "C" or better in PHYS 040D or consent of instructor. For engineering and physical sciences students. 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.

PHYS 097. Lower-Division Research. (1-4) Individual study, three to twelve 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. Astrophyiscs and Stellar Astromony. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010A, MATH 010B, MATH 016, or equivalents; PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D. Stellar interiors, rotations, and evolution. Origin of the elements and particle and electromagnetic radiation. Pulses, quasars, and other unusual objects. Galactic structure and cosmology.

PHYS 130A. Classical Mechanics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B, MATH 046, PHYS 040A. Topics include vector calculus, single-particle motion, oscillations, Lagrangian and Hamiltonian dynamics, and central-forces motion and celestial mechanics.

PHYS 130B. Classical Mechanics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PHYS 040B, PHYS 040D, 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 134. Thermal Physics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B, PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, PHYS 040E. Macroscopic properties of many-particle systems. Laws and applications of thermodynamics; entropy, thermodynamic potentials, ideal gases. Principles and applications of statistical mechanics: probability distributions, canonical, microcanonical, and grand canonical ensembles; specific heat of solids; paramagnetism; kinetic theory of gases; phase transitions; quantum statistics.

PHYS 135A. Electromagnetism. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B, MATH 046, PHYS 040C. Topics include vector calculus, Coulomb’s law and the electric field, Gauss’ law, scalar potential, conductors in electrostatic fields, electromagnetic energy, electric multipole, boundary conditions, electrostatics in the presence of matter, and special methods in electrostatics.

PHYS 135B. Electromagnetism. (4) Lecture, three hours; discussion, one 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 multipole, magnetism in the presence of matter, Maxwell’s equations, and plane waves.

PHYS 136. Electromagnetic Waves. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PHYS 040D, PHYS 135B. 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 microwave ovens; and applications to experimental crystallography.

PHYS 139L. Electronics for Scientists. (5) Lecture, three hours; laboratory, six hours. Prerequisite(s): PHYS 040C or consent of instructor. An introduction to basic analog and digital circuit designs emphasizing practical applications. Topics include 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. (1-4) Laboratory, three to twelve hours. Prerequisite(s): PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, PHYS 040E; upper-division standing in Physics. Experiments chosen from areas in contemporary physics. Course is repeatable to a maximum of 8 units.

PHYS 150. Solid State Physics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, PHYS 040E; or consent of instructor. Properties of systems composed of many atoms arranged in a 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; superconductivity; and magnetism.

PHYS 156A. Quantum Mechanics. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 010B, PHYS 140A, PHYS 150A. Topics include wave-particle duality; the Schrödinger equation; superposition, the uncertainty principle; and one-dimensional harmonic oscillator.

PHYS 156B. Quantum Mechanics. (4) Lecture, three hours; discussion, one 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 163. Atomic Physics and Spectroscopy. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PHYS 140A, PHYS 150A. Topics include wave-particle duality; the Schrödinger equation; superposition, the uncertainty principle; and one-dimensional harmonic oscillator.

PHYS 177. Computational Methods for Physical Sciences. (4) Lecture, three hours; laboratory, three hours. Prerequisite(s): PHYS 040A, PHYS 040B, PHYS 040C, PHYS 040D, PHYS 040E; or consent of instructor. Computer applications for solving problems in physical sciences. Symbolic manipulation languages such as Mathematica. Mathematical operations, plotting, and symbolic and numerical techniques in calculus. Numerical methods such as histogramming, Monte-Carlo method for modeling experiments, statistical analysis, curve fitting, and numerical algorithms. Prior knowledge of the computer is not required.

PHYS 190. Special Studies. (1-5) Individual study, three to fifteen hours. To be taken with the consent of the chairman of the department 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 by a departmental chair. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 9 units.

PHYS 190L. Special Studies at Los Alamos National Laboratory. (1-8) Individual study, three to twenty-four hours. Prerequisite(s): admission to the UCR/LANL Educational Internship Program; consent of advisor and Chair in charge. Individual study to meet special curricular needs. Course is repeatable to a maximum of 16 units.

PHYS 195A. Senior Thesis. (1-4) Thesis, three to twelve 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). Graded In Progress (IP) until the last quarter is completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. 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 toward the unit requirements for the major. Chair in charge.

PHYS 195B. Senior Thesis. (1-4) Thesis, three to twelve 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). Graded In Progress (IP) until the last quarter is completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. 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 toward the unit requirements for the major. Chair in charge.

PHYS 195C. Senior Thesis. (1-4) Thesis, three to twelve 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). Graded In Progress (IP) until the last quarter is completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. 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 toward the unit requirements for the major. Chair in charge.

PHYS 195D. Senior Thesis. (1-4) Thesis, three to twelve 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). Graded In Progress (IP) until the last quarter is completed, at which time a final, Satisfactory (S) or No Credit (NC) grade is assigned. 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 toward the unit requirements for the major. Chair in charge.

PHYS 198-I. Individual Internship in Physics. (1-12) Individual study, three to twenty-four hours. Prerequisite(s): senior standing; consent of instructor; PHYS 195A. Designed to provide experience as a practicing scientist in a government or industrial laboratory. A thesis written on research conducted 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-IV. Individual Internship in Physics. (1-12) Internship, three to thirty-six hours. Prerequisite(s): up-division standing; consent of the Department Chair. Designed to provide experience as a practicing scientist in a government or industrial laboratory. A plan must be approved by the Department Chair. The internship is jointly supervised by an off-campus sponsor and a Physics faculty
member. Student must submit a written final report. A maximum of 4 units may be used to satisfy major requirements. Graded satisfactory (S) or no credit (NC). Course is repeatable to a maximum of 12 units. Chair in charge.

**GRADUATE COURSES**

**PHYS 205. Classical Mechanics.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 205. Elastic Theory: stress tensor, strain tensor, elastic tensor, the elastic equation of motion, elastic waves. Hydrodynamics: Equation of continuity, conservation laws, the Euler equation, vorticity, viscous fluids, the Navier-Stokes equations; surface and internal waves, nonlinear behaviors, wave packets, traveling waves.

**PHYS 208. General Relativity.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 205. Tensors, covariant derivative, the Riemann curvature tensor and Einstein's equation. The Schwartzchild metric and applications to the solar system and black holes. Gravity waves and expanding universe.

**PHYS 209A. Quantum Electronics.** (4) Lecture, four and one-half hours. Prerequisite(s): 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, four and one-half 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 experiments. Three- and four-wave mixing, high-resolved nonlinear spectroscopies, rare atom and molecule experiments. Three- and four-wave mixing.

**PHYS 210A. Electromagnetic Theory.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 201A; graduate standing; consent of instructor. Topics include electrostatics, Gouy-Lamé potential, method of images, Laplace's equations in Cartesian, spherical and cylindrical coordinates, magnetostatics, boundary value problems, multipole expansions, and dielectric media.

**PHYS 210B. Electromagnetic Theory.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 210A; graduate standing; consent of instructor. Topics include electromagnetic waves, special theory of relativity, tensor analysis, radiative properties of electromagnetic fields with charged particles, Lagrangian formulation, gauge transformation, and magnetic monopoles.

**PHYS 211A. Radiative Processes in Astrophysics.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 155A, PHYS 155B, PHYS 156, PHYS 156A, PHYS 156B. Radiative transfer of continuum and line radiation, radiation properties, Einstein coefficients, photoionization equilibrium, 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 structures, 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, three hours; consultation, one hour. Prerequisite(s): PHYS 211A. Covariant hydrodynamics, sound waves, turbulence, supersonic turbulence, magnetohydrodynamics, Alfvén waves, extragalactic relativistic jets, supersonic jets, galactic spiral structure and density-wave theory, accretion disk theory, Rutherford-Hartree 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, three hours; consultation, one hour. Prerequisite(s): graduate standing; consent of instructor. Topics include thermodynamics, statistical mechanics, ideal Bose systems, ideal Fermi systems, and bulk motion.

**PHYS 212B. Thermodynamics and Statistical Mechanics.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 212A; graduate standing; consent of instructor. Topics include functional integrals, approximate techniques for phase transitions, and the renormalization group.

**PHYS 221A. Quantum Mechanics.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 221A; graduate standing; consent of instructor. A study of 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.

**PHYS 221B. Quantum Mechanics.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 221A; graduate standing; consent of instructor. Covers symmetries in quantum mechanics, identical particles, and scattering theory.

**PHYS 222A. Advanced Quantum Mechanics and Quantum Theory of Fields.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 221A, PHYS 221B, PHYS 221C; consent of instructor. Topics include field quantization, propagators and Green's functions, linear response theory, the Kubo formula, the fluctuation-dispersion theorem, finite-temperature Green's functions, Matsubara techniques, applications to the free-electron gas, Gor'kov Green's functions in superconductivity, and the Hubbard model. 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 222B. Advanced Quantum Mechanics and Quantum Theory of Fields.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 221A, PHYS 221B, PHYS 221C; consent of instructor. Topics include field quantization of fields with particles, spin 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 230A. Advanced Quantum Mechanics and Quantum Theory of Fields.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 221A, PHYS 221B, PHYS 221C, consent of instructor. Topics include field quantization of fields with particles, spin 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, three hours; consultation, one hour. Prerequisite(s): PHYS 230A or consent of instructor. Exploration 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, three hours; consultation, one 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 fundamental 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, three hours; consultation, one 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 240A. Solid State Physics.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 240A or consent of instructor. Topics include electron-electron interactions, surface effects, classification of solids, cohesive energy, classical and quantum harmonic crystals, measurement of phonons, phonons in metals, dielectric properties, homogeneous and inhomogeneous semiconductors, defects, diamagnetism, paramagnetism, magnetic interactions and ordering, and superconductivity. 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 240B. Solid State Physics.** (4) Lecture, three hours; consultation, one hour. Prerequisite(s): PHYS 240A or consent of instructor. Topics include electron-electron interactions, surface effects, classification of solids, cohesive energy, classical and quantum harmonic crystals, measurement of phonons, phonons in metals, dielectric properties, homogeneous and inhomogeneous semiconductors, defects, diamagnetism, paramagnetism, magnetic interactions and ordering, and superconductivity. 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 242. Physics at Surfaces and Interfaces.** (4) Lecture, three hours; consultation, one 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, vibrational states 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 253 (E-Z). Special Topics.** (1) Seminar, three 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. Chair in charge.

**PHYS 260. Selected Topics in Theoretical High-Energy Physics. (2)** Seminar, two 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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Wudka

**PHYS 261. Theory of Strongly Correlated Low-Temperature Systems. (2)** Seminar, two 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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Wudka

**PHYS 263. The Yukawa Sector Beyond the Standard Model.** (2) Seminar, two 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 quarks and their possible origins, renormalization group equations, and the role of the condensate mechanism. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Desai

**PHYS 264. Dynamics of Random Systems.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. A study of random systems, including Spin-glasses, Kac-Mode lattices, and structural glasses. Also covers theory and experiment with special attention to the order parameter, replica theory, and Superconducting Quantum Interference Device (SQUID) susceptometer measurements. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Desai

**PHYS 265. DNA Computation.** (2) Seminar, two 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 self-reproducing zygotes. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Mills

**PHYS 266. Theoretical Aspects of Fundamental Particle Interactions.** (2) Seminar, two 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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Ma

**PHYS 267. Hadron Physics at Electron-Positron Colliders.** (2) Seminar, two 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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Gary

**PHYS 268. Electroweak Physics at Electron-Positron Colliders.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. The study of the electroweak interaction at high-energy e⁺e⁻ colliders. Covers properties of the Z and W bosons. Emphasis is placed on the high precision tests of the Standard Model. Includes computer programs in similar tests in other reactions. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Clare

**PHYS 270. Magnetic Resonance Techniques in Condensed Matter Physics.** (2) Seminar, two 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 (μSR), and heavy-fermion materials. Topics are selected to correspond to the experience and interests of the students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. McLaughlin

**PHYS 271. Heavy Ion Physics.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Heavy ion collisions at high energies. Survey of experimental data and study of theoretical expectations for the production of the quark-gluon plasma. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Seto

**PHYS 272. Deep Inelastic Scattering and Strong Interactions.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. A systematic study of deep inelastic scattering processes and strong interactions. Discussion of experiments with particular emphasis on parton distribution functions and nuclear structure, heavy quark physics, and the search for new particles. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Wimpenny

**PHYS 273. Experimental Tests of Electroweak Physics.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Topics include current and planned precision measurements in the standard electroweak model, electromagnetic and weak production, and decays of tau leptons and muons. Emphasis on experimental techniques and comparisons of data. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. VanDalen

**PHYS 274. Experimental Relativistic Nucleon-Nucleon Collisions.** (2) Seminar, two 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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Barish

**PHYS 275. Experimental Physics of Electromagnetic and Weak Interactions.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. A systematic study of electromagnetic and weak interactions. Discussion of experiments with particular emphasis on symmetry principle violations, selection rules, and higher symmetries. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Shen

**PHYS 276. Experimental Aspects of Electroweak Symmetry Breaking.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. A systematic study of electromagnetic and weak interactions. Discussion of experiments with particular emphasis on symmetry principle violations, selection rules, and higher symmetries. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Yarmoff

**PHYS 278. Surface Sciences.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Topics include geometrical and electronic structure at surfaces, and surfaces of thin films, mechanisms of film growth on surfaces; and development of novel surface science analytical techniques. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Zych

**PHYS 280. Space Physics and Astrophysics.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Topics include large-scale structure of the universe, the physics of the interplanetary space and interstellar medium, and particle acceleration and transport. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Zank

**PHYS 282. Experimental Investigations of Strongly Correlated Materials.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Examinations of the magnetic and transport properties in strongly correlated materials which often exhibit unusual broken-symmetry ground states. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Beyermann

**PHYS 283. Techniques of Microscopy.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. 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. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Mohideen

**PHYS 284. Optical Techniques for Measurements in Physics.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Current topics in optical physics and the use of optical and nonlinear techniques to make measurements of interest in atomic, molecular, chemical, and condensed matter physics. Emphasizes advances in science enabled by advances in laser technology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Tom

**PHYS 285. Experimental Techniques in Particle Physics.** (2) Seminar, two hours. Prerequisite(s): graduate standing; consent of instructor. Discussion of experiments in future super-colliders and their physics capabilities, focusing on the searches for the Higgs, top quark physics, and supersymmetric particles. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Hull

**PHYS 289. Colloquium in Physics.** (1) Colloquium, one 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, three to eighteen 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 297. Directed Research.** (1-6) Outside research, three to eighteen 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, three to thirty-six 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.
PHYS 302. Teaching Practicum. (1–4) Consultation, one hour; laboratory, three to twelve hours; practicum, three to twelve 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 requirements. Course is repeatable to a maximum of 12 units. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Chair in charge

PHYS 401. Scientific Writing and Illustration. (1) Lecture, one 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 PATHOLOGY

Subject abbreviation: PLPA

Michael E. Stanghellini, Ph.D., Chair
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(800) 735-0717 or (909) 787-4116
www.plantpathology.ucr.edu

Professors
Michael F. Allen, Ph.D. (Plant Pathology/Biology)
Michael D. Coffey, Ph.D.
Donald A. Cooksey, Ph.D.
J. Allan Dodds, Ph.D.
Dennis D. Focht, Ph.D.
David J. Gumpf, Ph.D.
John A. Mengel, Ph.D.
Joseph S. Semancik, Ph.D.
James S. Sims, Ph.D.
Michael E. Stanghellini, Ph.D. Cy Monradick
Chair in Desert Agriculture

Professors Emeriti
Salomon Bartnicki-Garcia, Ph.D.
Paul R. Desjardins, Ph.D.
Joseph W. Eckert, Ph.D.
Robert M. Endo, Ph.D.
Donald G. Erwin, Ph.D.
Donald E. Munnecke, Ph.D.
Ivan J. Thomason, Ph.D. (Plant Pathology/Nematology)
Peter H. Tsao, Ph.D.
Seymour D. Van Gundy, Ph.D. (Plant Pathology/Nematology)
Lewis G. Weathers, Ph.D.
George A. Zentmyer, Ph.D.

Associate Professors
James E. Adaskaveg, Ph.D.
Howard S. Judelson, Ph.D.
A. L. N. Rao, Ph.D.

Assistant Professors
Katharine Borkovich, Ph.D.

James G. Borneman, Ph.D.
Shou-Wei Ding, Ph.D.
John P. Vogel, Ph.D.

Lecturers
Lawrence Marais, Ph.D.
Francis P. Wong, Ph.D.

Affiliated Faculty
Ellis E. Darley, Ph.D. (Plant Pathologist Emeritus)
Martin J. Kolbezen, Ph.D. (Chemist Emeritus)

UNDERGRADUATE CURRICULUM

The Department of Plant Pathology participates in the Biological Sciences interdepartmental major, in which students may specialize in areas such as Microbiology, Plant Sciences, and Entomology. It also participates in the Botany and Plant Sciences major leading to the baccalaureate degree. See the Biological Sciences or Botany and Plant Sciences section of this catalog.

GRADUATE PROGRAM

In addition to meeting the requirements for admission to the Graduate Division, the student must 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 general 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 recommended that they have completed courses in biochemistry, organic chemistry, quantitative analysis, elementary college mathematics, general physics, general botany, microbiology, statistics, genetics, plant anatomy, 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 recommended courses prior to admission for graduate studies, they may be required to take them early in their graduate career.

Master's Degree

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, 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 260/NEM 260, and participation in PLPA 250 and PLPA 260/NEM 260 for each term the student is registered.

Doctoral Degree

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, 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 which normally includes as a minimum, PLPA 200, PLPA 203, PLPA 204, PLPA 260/NEM 260, and participation in PLPA 250 and PLPA 260/NEM 260 for each term the student is registered. PLPA 251 and PLPA 240 are strongly recommended for most students.

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 exam and defended during the oral exam. Only after successful completion of the qualifying examination and all other formal requirements to the satisfaction of the dean of the Graduate Division, is the student advanced to candidacy for the Ph.D. degree.

Dissertation and Final Oral Examination

A dissertation 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

UPPER-DIVISION COURSES
PHYS 002C, PHYS 021C, 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; interaction during disease development; and strategies for disease management. An optional, separate laboratory is offered. Cross-listed with BIOL 120 and MCB 120. Stanghellini

PLPA 120L. Introduction to Plant Pathology Laboratory, (1) F Laboratory, four hours. Prerequisite(s): BIOL 005A, BIOL 005B, concurrent enrollment in BIOL 134/PLPA 134 or consent of instructor; BIOL 121A/MCB 121A and BIOL 121B/MCB 121B recommended. 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 MCB 120L. Stanghellini

PLPA 123. Introduction to Comparative Virology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 010, CHEM 001C or CHEM 01HC, CHEM 112C, MATH 090B or MATH 091B, PHYS 002C, PHYS 021C, 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 MCB 123. Rao

PLPA 134. Introduction to Mycology. (3) Lecture, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, BIOL 005C, CHEM 001C or CHEM 01HC, MATH 090B or MATH 091B, PHYS 002C, PHYS 021C, 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, three 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 representative fungi of the major taxa of fungi. Cross-listed with BIOL 134L.

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.

PLPA 200. Fungal Diseases of Plants. (4) S, Even Years Lecture, three hours; laboratory, three 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, and control; measures including breeding for resistance and chemical and biological control. Coffey

PLPA 203. Bacterial Diseases of Plants. (4) W, Odd Years Lecture, two hours; laboratory, six hours. An extensive introduction to bacterial diseases of plants, including: symptomatology; epidemiology; diagnosis; control, and the physiology and biochemistry of plant-bacterial interactions. Cooksey

PLPA 204. Viral Diseases of Plants. (4) S, Even Years Lecture, two hours; laboratory, six hours. Prerequisite(s): BIOL 120/MCB 120/PLPA 120 or consent of instructor. A study of viral diseases of plants and the agents causing them. Topics include historical developments, symptomatology, epidemiology, control, and classification of viruses pathogenic to plants. Special emphasis placed on the molecular nature of the pathogens and the processes of pathogenesis. Dodds

PLPA 206. Phytopathogens: Nematodes. (2) S, Odd Years Lecture, one hour; laboratory, three 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 215. Genetics of Fungi, (3) F, Even Years Lecture, three hours. Prerequisite(s): BIOL 102 or consent of instructor. Molecular and cellular mechanisms of fungal reproduction and genetic recombination. Classical and molecular genetic methods used in mycological research. Genetics aspects of fungal metabolism, development, pathogenesis, systematics, and evolution. Judelson

PLPA 219. Molecular Plant Virology. (3) W, Odd Years Lecture, three hours. Prerequisite(s): PLPA 204. Molecular biology of animal and bacterial viruses and viroids with emphasis on plant viruses; replication strategies; evolution; genetics; viruses as genetic vectors; and recombination. Rao

PLPA 220A. Morphology and Taxonomy of Fungi: Ascomycetes and Basidiomycetes. (4) F, Even Years Lecture, two hours; laboratory, six hours. Prerequisite(s): BIOL 134/PLPA 134 or equivalent. Provides an in-depth examination of fungal taxonomy, classification, morphology and life cycles. Discusses the historical and ecological importance of certain fungi and their role in plant disease, industry, and human welfare. Menge

PLPA 220B. Morphology and Taxonomy of Fungi: Deuteromycetes and Myxomycetes. (4) W, Odd Years Lecture, two hours; laboratory, six hours. Prerequisite(s): BIOL 134/PLPA 134 or equivalent. Provides an in-depth examination of fungal taxonomy, classification, morphology and life cycles. Discusses the historical and ecological importance of certain fungi and their role in plant disease, industry, and human welfare. Menge

PLPA 221. Chemical Control of Plant Diseases. (3) W, Even Years Lecture, three hours. Prerequisite(s): consent of instructor. A study of the principles of selective toxicity as applied to the control of plant diseases; the chemistry and mechanism of action of antimicrobial agents. PLPA 227. Molecular Nematology, (2) W, Odd Years Lecture, two hours. Prerequisite(s): graduate standing or consent of instructor. A review of the unifying principles. Cross-listed with NEM 227.

PLPA 231. Physiology of Plant Disease. (3) F, Odd Years Lecture, three hours. Prerequisite(s): BCH 100, BIOL 120/MCB 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. PLPA 235. Epidemiology of Plant Disease. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 120/MCB 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.

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, two 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 specific special topic area and varies accordingly. Course is repeatable. Cross-listed with MCB 241.

PLPA 245. Field Mycology, (F) F, Odd Years Field trips. Prerequisite(s): BIOL 154/PLPA 154 or consent of instructor. This course will deal with observation, collection and identification of fungi both in the field and the laboratory. Course is to be graded Satisfactory (S) or No Credit (NC). Menge

PLPA 246. Diagnosis of Plant Diseases. (2) W Lecture, one hour; laboratory, one hour; field, two 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 weeds, and influences of crop management on disease development. Marris

PLPA 250. Seminar in Plant Pathology, (1) Seminar, one 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 and Nematology, (1) Seminar, one hour. Prerequisite(s): graduate status. Topics in plant pathology and nematology will be discussed by outstanding workers in the field from this and other campuses and by graduating students. Graded Satisfactory (S) or No Credit (NC). Cross-listed with NEM 260.

PLPA 261. Colloquium in Recombinant DNA. (1) Seminar, one hour. Prerequisite(s): graduate status or consent of instructor. Oral reports by visiting scholars, faculty and students on current research topics in recombinant DNA. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 261, BIOL 261, BSCS 261, and ENT 261.

PLPA 265. A Colloquium on the Principles of Plant Pathology, (3) Lecture, three 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) Research, one to six 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) Research, one to six 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).

PLPA 299. Research for Thesis or Dissertation, (1-12) Graded Satisfactory (S) or No Credit (NC). Course is repeatable.
Political Science

Subject abbreviation: POSC

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Professors
Shaun Bowler, Ph.D.
John C. Laursen, Ph.D.
Max Neiman, Ph.D.
David S. Pion-Berlin, Ph.D.
John T. Williams, Ph.D.

Professors Emeriti
Charles R. Adrian, Ph.D., LL.D.
Francis M. Carney, Ph.D.
Ivan H. Hindertaker, Ph.D., LL.D.
Arthur Campbell Turner, M.Litt., Ph.D.
Frank Way, Ph.D. (Political Science/Religious Studies)

Associate Professor
Ronald O. Loveridge, Ph.D.

Assistant Professors
Juliani E. Allison, Ph.D.
Jonathan T. Hickey, Ph.D.
P. Martin Johnston, Ph.D.
Bronwyn A. Lembah, Ph.D.
John N. Medearis, Ph.D.

Acting Assistant Professor
John W. Gioffi, M.A.

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 a Minor in Political Science.

Counseling
The department designates selected members of the faculty as undergraduate advisors, and each major is assigned to an advisor. Counseling on graduation and departmental requirements and on enrollment is handled in the department office by the student affairs staff. Each student, however, is required to meet annually with an assigned faculty advisor.

For more information about the undergraduate programs, call or write the Department of Political Science, (909) 787-5502.

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.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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 (16 units) /
   (four courses). The following lower-division courses are required:
   POSC 005; POSC 010; POSC 015,
   POSC 142L and POSC 142M are allowed
   toward the 36-unit upper-division
   requirement.)
   a) One course from each of the following areas:
   (1) U.S. Government and Politics:
   POSC 100, POSC 101, POSC 143,
   POSC 145, POSC 146, POSC 148,
   POSC 149, POSC 166, POSC 167,
   POSC 168, POSC 170, POSC 171,
   POSC 172/URST 172, POSC 173,
   POSC 174, POSC 179, POSC 181,
   POSC 182, POSC 183, POSC 185,
   POSC 186
   (2) Comparative Government and
   Politics: POSC 151, POSC 152,
   POSC 153, POSC 154, POSC 155,
   POSC 157, POSC 158, POSC 160A,
   POSC 160B, POSC 161, POSC 162,
   POSC 165, POSC 165A, POSC 165B
   (3) International Relations and
   Foreign Policy:
   POSC 123, POSC 124, POSC 125,
   POSC 126, POSC 127, POSC 128,
   POSC 129, POSC 130, POSC 163
   (4) Political Theory: POSC 110,
   POSC 111, POSC 112, POSC 113,
   POSC 116, POSC 122
   b) Twenty (20) additional units in Political
   Science course work (Not more than 8
   units from the 190 series and
   POSC 142L and POSC 142M are allowed
   toward the 36-unit 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:

Political Science requirements (48 units)

1. Lower-division requirements
   Three courses from POSC 005, POSC 010, POSC 015, POSC 020

2. Upper-division requirements
   a) Three courses from POSC 181, POSC 182, POSC 183, POSC 185, POSC 186
   b) At least one course from each of the following:
      1) U.S. Government and Politics: POSC 100, POSC 101, POSC 143, POSC 145, POSC 146, POSC 148, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 172, POSC 173, POSC 174, POSC 179, POSC 181, POSC 182, POSC 183
      2) Comparative Government and Politics: POSC 151, POSC 152, POSC 154, POSC 155, POSC 156, POSC 157, POSC 158, POSC 160A, POSC 160B, POSC 161, POSC 162, POSC 165A, POSC 165B
      3) International Relations and Foreign Policy: POSC 123, POSC 124, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 163
      4) Political Theory: POSC 110, POSC 111, POSC 112, POSC 113, POSC 116, POSC 122
      c) Four (4) units from POSC 198G or POSC 198-I
      d) Additional four (4) units in any upper-division Political Science course

Administrative Studies requirements (37 units)

1. Lower-division courses (17 units)
   a) BSAD 010, BSAD 020A
   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 102A or ECON 130 or ECON 162/BSAD 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): BSAD 105/ANTH 105, BSAD 176/SOC 176, SOC 150, SOC 151
      2) Human Resources Management/Labor Relations: BSAD 152/ECON 152, BSAD 153/ECON 153, BSAD 155, BSAD 157, PSYC 142
      3) Business and Society: BSAD 161, PHIL 116, POSC 182, POSC 186
      4) Marketing: BSAD 110, and two from BSAD 112, BSAD 113, BSAD 114, BSAD 117
      5) Managerial Accounting/Taxation: BSAD 163, and two from BSAD 166, BSAD 168A, BSAD 168B
      6) Financial Accounting: BSAD 165A, BSAD 165B
      7) Finance: BSAD 134/ECON 134 and two from BSAD 135A, BSAD 136, BSAD 137, BSAD 138, BSAD 139
      8) Management Information Systems: BSAD 170, BSAD 171, BSAD 173
      9) Production Management: BSAD 121/STAT 121, and two from BSAD 122, BSAD 126, BSAD 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/Law and Society Major

The major requirements for the B.A. degree in Political Science/Law and Society are as follows:

1. Requirements for Political Science (52 units)
   a) Three courses (16 units) from the following:
      1) ECON 102A or ECON 130 or ECON 162/BSAD 162
      2) PSYC 140 or PSYC 142
      3) SOC 150 or SOC 151 or SOC 171
   b) An additional two (2) units of Political Science courses (16 units) from the following:
      1) ECON 102A or ECON 130 or ECON 162/BSAD 162
      2) PSYC 140 or PSYC 142
      3) SOC 150 or SOC 151 or SOC 171
   c) At least one course from each of the following:
      1) Organizations (General): BSAD 105/ANTH 105, BSAD 176/SOC 176, SOC 150, SOC 151
      2) Human Resources Management/Labor Relations: BSAD 152/ECON 152, BSAD 153/ECON 153, BSAD 155, BSAD 157, PSYC 142
      3) Business and Society: BSAD 161, PHIL 116, POSC 182, POSC 186
      4) Marketing: BSAD 110, and two from BSAD 112, BSAD 113, BSAD 114, BSAD 117
      5) Managerial Accounting/Taxation: BSAD 163, and two from BSAD 166, BSAD 168A, BSAD 168B
      6) Financial Accounting: BSAD 165A, BSAD 165B
      7) Finance: BSAD 134/ECON 134 and two from BSAD 135A, BSAD 136, BSAD 137, BSAD 138, BSAD 139
      8) Management Information Systems: BSAD 170, BSAD 171, BSAD 173
      9) Production Management: BSAD 121/STAT 121, and two from BSAD 122, BSAD 126, BSAD 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 (8 units):
   a) PHIL 007 or PHIL 007H
   b) LWSO 100
   c) One course chosen from the following list: ECON 111, PSYC 012, SOC 110A, POSC 114, or equivalent course in research methods
   d) Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159, or equivalent course in research methods
   e) LWSO 193, Senior Seminar

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 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:

1. Lower-division requirements (12 units)
   a) POSC 010
b) One course from POSC 005, POSC 015, POSC 020

c) ECON 003

2. Upper-division requirements (52 units)

a) SOC 110A

b) SOC 110B or STAT 040

c) Political Science distribution: choose one course from each group


(2) International Relations and Foreign Policy Group: POSC 124, POSC 125, POSC 126, POSC 128, POSC 129, POSC 130, POSC 163

(3) Political Theory Group: POSC 110, POSC 111, POSC 112, POSC 113, POSC 116, POSC 122

d) Public Service requirement

(1) POSC 181, POSC 183

(2) Eight (8) units of POSC 198-I or POSC 198-G

(3) An additional 16 units from POSC 118, POSC 170, POSC 171, POSC 172/URST 172, POSC 182, POSC 185, POSC 186

Minor

The Political Science Department also offers a minor in Political Science.

1. One 4-unit lower-division course in political science, selected from POSC 005, POSC 010, POSC 015, POSC 016, or POSC 017; POSC 020

2. Twenty (20) upper-division units to be selected as follows:

a) One course in each of the following areas (16 units):

(1) American Politics: POSC 100, POSC 101, POSC 145, POSC 146, POSC 148, POSC 149, POSC 166, POSC 167, POSC 168, POSC 170, POSC 171, POSC 172/URST 172, POSC 173, POSC 174, POSC 179, POSC 181, POSC 182, POSC 183, POSC 185, POSC 186

(2) Comparative Politics: POSC 151, POSC 152, POSC 153, POSC 154, POSC 155, POSC 157, POSC 158, POSC 160A, POSC 160B, POSC 161, POSC 162, POSC 165A, POSC 165B

(3) International Relations: POSC 123, POSC 124, POSC 125, POSC 126, POSC 127, POSC 128, POSC 129, POSC 130, POSC 165

b) One additional course (4 units) selected by the student from among those listed in (1) through (4) above.

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies 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 (i.e., POSC 114) recommended

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 Program

The Model United Nations (MUN) program is a campuswide activity that combines academic and social aspects. However, the academic preparation that underlies the program and trains the participants takes place within the Political Science Department. There are two courses, POSC 142L and POSC 142M for MUN. Each year UCR hosts a two-day MUN conference for high schools, which attracts over a thousand high school students. In recent years, UCR’s High School MUN has been the third largest in the nation. In the spring, a delegation from UCR attends either a local conference or the National Model United Nations Conference in New York City. Planning and running this conference is entirely in the hands of UCR students enrolled in the MUN program. It provides training in administration as well as in diplomacy.

Education Abroad Program

The Political Science Department encourages eligible students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

GRADUATE PROGRAM

The requirements for graduate degrees in the Department of Political Science for students entering a program effective Fall 2001 may not be fully reflected below. Consult the department Graduate Secretary for current requirements.

Admission to graduate status is based on the quality and character of previous academic work, scores on the GRE, and letters of evaluation from previous instructors. The same criteria apply to applicants for the M.A. and Ph.D. degrees.

Master’s Degree

There are two plans under which the master’s degree is administered. With rare exceptions the department operates under Plan II (Comprehensive Examination) in administering the master’s degree program. Under this plan, students must complete 36 units, of which at least 28 units must be in 200-level Political Science courses, including POSC 201 and POSC 202A. In addition, students must complete at least one course from at least one of the five fields offered by the department (see listing below). Up to 8 units of academic work in related fields may be approved by the graduate advisor as part of the 36 units.

Comprehensive Examination The examination must be passed in one of the following fields:
1. **Comparative Politics**  
Students must complete the core course and at least one additional course in the appropriate field.

2. **International Relations**  
Students must complete the core course and at least one additional course in the appropriate field.

3. **American Politics**  
Students must complete two courses between POSC 250 and POSC 254.

4. **Mass Political Behavior**  
Students must complete two courses between POSC 255 and POSC 259; at least one of those courses must be chosen from the seminars POSC 255, POSC 256, or POSC 257.

5. **Political Theory**  
Students must complete the core course and at least three additional courses in the appropriate field.  
Minors selected from the fields listed above must include the appropriate core course (for Comparative Politics, International Relations, and Political Theory), plus two additional seminars. Minors in Mass Political Behavior are composed of three courses numbered between POSC 255 and POSC 259, at least two of which must be chosen from among the following seminars: POSC 255, POSC 256, and POSC 257. The minor field in American Politics consists of at least three courses chosen from among those numbered POSC 250 and POSC 254.

Specific course work in a cognate minor field varies depending on the course list preapproved by the Graduate Committee. POSC 290 courses may be accepted in lieu of seminars. However, prior to passing the Ph.D. examinations, no more than two POSC 290 courses are allowed, with no more than one in each field of examination. The limit can be exceeded 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.

The second stage of the program is normally one year (Year 3). In the fall quarter, the student enrolls in POSC 291 (Individual Coordinated Study) and prepares for the comprehensive Ph.D. examination. Written examinations in the two major fields are normally taken in 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. The winter and spring quarters are devoted in part to the preparation of the Professional Paper (POSC 285), which is required of all students, and Directed Research (POSC 297) to prepare a dissertation prospectus under the direction of the principal advisor. The purpose of the Professional Paper is the writing of a manuscript that demonstrates the capacity of the student to identify, implement, and report on a manageable research topic. Students also complete at least one additional course in both the winter and spring quarters. These courses are determined by the faculty and major advisor in consultation with the student and should be applicable either to completion of work in the minor field or to the dissertation project. In the spring quarter, students are advanced to candidacy upon successful completion of the oral defense of their dissertation prospectus.

Years 4 and 5 comprise the third stage of the program. Students are normally expected to complete their degree within this period. 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 biennial 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 reported 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.

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**LOWER-DIVISION COURSES**

**POSC 005. Modern Political Ideologies. (4)** Lecture, three hours; discussion, one hour. An introductory study of the ideologies of modern mass movements: Liberal democracy, conservatism, democratic socialism, fascism, and various Marxist perspectives, including Leninism and Maoism, will be covered.

**POSC 010. American Politics. (4)** Lecture, three hours; discussion, one hour. 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. (4)** Lecture, three hours; discussion, one hour. 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. (4)** Lecture, three hours; discussion, one hour. A comparative analysis of contemporary political systems, practices and institutions. Credit is awarded for only one of POSC 015, POSC 016, or POSC 017.

**POSC 016. Comparative Politics in Ex-Communist States. (4)** Lecture, three hours; discussion, one hour. An introduction to the political processes and problems confronting former communist states. Topics include dictatorship, democracy, voting, elections, and parties. Credit is awarded for only one of POSC 015, POSC 016, or POSC 017.

**POSC 017. Politics of the Underdeveloped World. (4)** Lecture, three hours; discussion, one hour. An introduction to the political processes and problems confronting third world states. Topics include poverty, violence, dictatorship, civil-military relations, regime transi-
tions, and democracy. Credit is awarded for only one of
POSC 015, POSC 016, or POSC 017.

POSC 020. World Politics. (4) Lecture, three hours; discussion, one hour. Problems of war and peace. The sources of international tension and conflict: imperialism, nationalism, conflict among great powers, arms race. Prospects for their resolution: through world law, diplomacy and United Nations. Problems for the future: overpopulation, environmental crisis and the have-have not gap.

POSC 045. Special Seminar in Political Science. (1) Seminars on special topics in political science. 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, three hours; outside research, one hour; individual study, one hour; term paper, one 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, three hours; outside research, one hour; extra reading, one hour; term paper, one 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 109. Political Religions and Religious Politics. (4) Lecture, three hours; term paper, three 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, sacred kingship, religious zealotry and ritual, integralism, and the conformity of the polity to religious values. Cross-listed with RJST 173.

POSC 110. The Origins of Our Political Ideas. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the major schools of political thought of ancient times. Discusses political philosophers such as Plato, Aristotle, Confucius, and Ashoka.

POSC 111. Democracy and the Social Contract. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the major political philosophers of the social contract and their critiques on issues such as individual 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the principal philosophies from the eighteenth century to the present, with attention to issues such as environmentalism, ethnic nationalism, economic freedom, and feminism.

POSC 113. American Political Thought. (4) Lecture, three hours; extra reading, three 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, three hours; extra reading, two hours; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. A discussion of the development and scope of political science as a discipline. A consideration of selected theoretical and methodological issues in contemporary political and social science.

POSC 116. Political Thought of Socialism. (4) Lecture, three hours. An examination of the major schools of European socialist thought from the French Revolution to the present. Special attention will be paid to such post-Marxian thinkers as Sorel, Bernstein, Kautsky, and Lenin.

POSC 118. Ethics in Government. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing 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 120. The Politics of India and Pakistan. (4) Lecture, three hours; extra reading and term paper, three 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 122. Skepticism and Liberalism. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; term paper. Prerequisite(s): upper-division standing or consent of instructor. Examines 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, three hours; extra reading, one hour; term paper, two hours. Prerequisite(s): upper-division standing or consent of instructor. A study 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, three hours; term paper, one hour; extra reading, two hours. Prerequisite(s): POSC 020. An in-depth consideration of the major contemporary international relations theories of 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.

POSC 125. United States Foreign Policy Since World War II. (4) Lecture, three hours; outside research, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. A survey of the major developments in U.S. foreign policy from 1945 to the present. Special attention is paid to relations with the Soviet Union, its successor states, and the World, within which the uses of force and diplomacy are emphasized.

POSC 126. The Politics of International Trade, Finance, and Development. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): POSC 020. 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 international system of governing the world trade, the role of multinational corporations; the Third World debt and development; the North Atlantic Treaty Organization and the European Union; economic reform in the Third World; and the relationship between trade and the environment.

POSC 127. International Environmental Politics. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; written work, one hour. Prerequisite(s): POSC 020. 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 environmental degradation on the politics of sub-Saharan Africa.

POSC 128. Comparative Foreign Policy. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; 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, and ideological 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, three hours; individual study, one hour; extra reading, one hour; term paper; one 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 considered 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, three hours; consultation, one hour. Prerequisite(s): upper-division standing or consent of instructor. Introduces students to 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, three hours; writing and extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the politics of postwar Japan. Topics include Who rules contemporary Japan? How does Japan explain long-term conservative rule and economic success? What are the sources of recent political instability and economic hard times and is the situation likely to continue?

POSC 141. Politics and American Writers. (4) Lecture, three hours; consultation, one hour. An examination of the ways that creative writers in the United States have sought to direct or to influence thought and expression about our common national life and poltical destiny. Novelist and poets from the classical period to the present will be studied.

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, two 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, two 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, three hours; consultation, one hour. An examination of political behavior in the United States with emphasis on political participation and voting behavior.
POSC 145. Money in American Politics. (4) Lecture, three hours; term paper and extra reading, three hours. Prerequisite(s): POSC 010 or POSC 010H 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 recent 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, three hours; term paper and reading, one 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 148. Politics of Congressional Elections. (4) Lecture, three hours; individual study, one hour; term papers. Prerequisite(s): upper-division standing, POSC 010, 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.

POSC 149. Presidential Elections. (4) Lecture, three hours; laboratory, one hour, extra reading, one hour; term paper, one hour. Prerequisite(s): upper-division standing. Investigation of presidential elections using computer simulation of presidential popularity, public opinion polls, 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, three hours; extra reading, essays, and research paper, three hours. Prerequisite(s): upper-division standing and 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.


POSC 152. Politics of the Middle East. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; term paper, one 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 politics 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, three hours; extra reading and term paper, three hours. Prerequisite(s): POSC 020. 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, three hours; extra reading, two hours; term paper, one 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, three hours. The comparative study of contemporary government and politics in Western Europe with special attention to the influence of economic, cultural, and other factors upon their formation. Comparative analysis of parties, bureaucracy, legislatures, and executive power in the states in which they reflect and contribute to the political life of the European peoples.

POSC 157. Modern Dictatorships. (4) Lecture, three hours; individual study, two hours; term paper, one 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; the dynamics of power; what contributed to their successes; and why some met with defeat.

POSC 158. Politics of Mexico. (4) Lecture, three hours; extra reading, two hours; term paper, one 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.

POSC 160A. Globalization and Underdevelopment. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. Critical examination of issues and theories about underdevelopment and the prospects for development within the context of globalization. Examines areas of continuity and change, resistance and conflict, and crises and solutions emerging in a post-World War II developing world increasingly connected to a single global economy.

POSC 160B. Political Economy: The Nation State and Capitalism. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): ECON 002. Focus on theoretical explanations of the political and economic transformations that took place in the world between 1400 and 1900. Particularly important questions include: (1) “Why has the nation state become the dominant form of political organization in the twentieth century?” and (2) “Why has capitalism become the dominant form of economic organization in the twentieth century?”

POSC 161. The Politics of Brazil. (4) Lecture, three hours; consultation, one hour. The theory and practice of Brazilian politics with emphasis on institutional and class forces. Attention to major ideas and events: unequal development, traditional and revolutionary politics, nationalism, the state and authoritarianism, the agrarian transition, mass mobilization, democracy, populism, and elections.

POSC 162. Latin America: The Quest for Development and Democracy. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. A comparative examination of central issues in and components of Latin American political life, including economic development, regimes and alliances, guerrilla wars, the armed forces, human rights, and democratic consolidation. Countries studied include Argentina, Brazil, Chile, El Salvador, and Cuba.

POSC 163. Latin America and International Politics. (4) Lecture, three hours; term paper, one hour, extra reading, two hours. Prerequisite(s): upper-division standing or consent of instructor. An exploration of international and inter-American relations and problems as they affect Latin American nations and situations. Particular attention is given to the impact of the International System on Latin America.

POSC 165A. Political Protest and Social Movements. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): POSC 015 or 020 or consent of instructor. Using a variety of interviewing, library, and research strategies, students explore the major social movements of groups such as blacks, women, Hispanics, Asians, Jews, gays and lesbians, and environmentalists. Emphasis is on social movements in contemporary America.

POSC 165B. Political Violence and Social Revolution. (4) Lecture, three hours; individual study, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): POSC 015 or 020 or consent of instructor. Exploration of the causes and consequences of the major revolutions (English, French, American, Russian, Chinese, Eastern European) set in historical and comparative context. Students also study the revolutionary potential of contemporary states.

POSC 166. Judicial Politics and Policy-Making. (4) Lecture, three hours. 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 as well as of the U.S. Supreme Court.

POSC 167. Constitutional Law: Fundamental Freedoms. (4) Lecture, three hours; outside research, one hour; individual study, one hour; term paper, one 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 suffrage.

POSC 168. Constitutional Law: Criminal Justice. (4) Lecture, three hours; extra reading, two hours; term paper, one 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 justice system in the United States; and the function of criminal law.

POSC 169. Terrorism and Political Violence. (4) Lecture, three hours; extra reading and term paper, three 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; a tool of 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, three hours; consultation, one 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, three 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, three hours; term paper and extra readings, three 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, three hours; extra reading, one hour; term paper, one hour. Prerequisite(s): upper-division standing or consent of instructor. An examination of the political process of California with particular attention paid to both electoral and legislative politics and the contribution they make to the issue of democratic governance under conditions of social diversity.

POSC 174. The Political Agenda and the Women’s Movement. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of the women’s movement as a social movement. The issues that the movement has placed on the political agenda and its impact on social change and public policy will be emphasized.

POSC 175. Introduction to the Honors Thesis. (4) Seminar, three hours; outside research, three
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, three hours; outside research, three 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, three to twelve 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 179. Urban Planning: Politics, Theory, and Law. (4) Lecture, three hours; term paper and extra readings, three hours. Prerequisite(s): upper-division standing and POSC 010. Introduces planning as a governing process. Topics include the intellectual, historical, and legal origins of planning by government, especially in urban contexts. Also discusses political considerations such as responsibility and accountability, democratic access, and conflict resolution.

POSC 181. Public Policy: Values, Conflict, and Politics. (4) Lecture; three hours; outside research, one hour; individual study, one hour; term paper, one hour. Prerequisite(s): upper-division standing and POSC 010. Methods and approaches used to describe, explain, and evaluate public policies are introduced and assessed. Group theoretical approaches, program planning, and budgeting systems are examples of methods and approaches covered.

POSC 182. Politics and Economic Policy. (4) Lecture, three hours; discussion, one hour. 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, three hours; outside research, one hour; extra reading, one hour; term paper, one 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 185. Public Budgeting. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division status or consent of instructor. An introduction to state and local budgeting, both revenues and expenditures, with an emphasis on the political, institutional and economic factors in public budgeting.

POSC 186. Regulation: A Political Perspective. (4) Lecture, three hours; discussion, one hour. 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 new social regulation in areas of environment, health and safety, and personal behavior. Rationales for and against regulation are evaluated, in theory and through case studies.

POSC 190. Special Studies. (1-5) Individual study, three to fifteen hours. Prerequisite(s): consent of instructor and department chair. Student prepares a written pro-

positional endorsed by a supervising instructor, as a means of meeting individual curricular needs. Course is repeatable to a maximum of 15 units.

POSC 196A. Moot Court: Legal Research, Writing, and Advocacy. (2) Seminar, two hours. Prerequisite(s): senior standing; GPA: POSC 167 or POSC 168. The first of a two-quarter introduction to legal materials and methods of research. Graded In Progress (IP) until POSC 196A and POSC 196B are completed, at which time a final letter grade is assigned.

POSC 196B. Moot Court: Legal Research, Writing, and Advocacy. (2) Seminar, two hours. Prerequisite(s): senior standing; GPA: POSC 167 or POSC 168. The second of a two-quarter introduction to legal materials and methods of research. Students are assigned by teams to prepare and present arguments in response to a hypothetical legal problem.

POSC 197. Research for Undergraduates. (1-4) Research, one to four 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, eight hours. Direct evaluation of the local political process through participant observation, combining academic instruction and supervised research. 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, to two twenty-four-hour units; reading and writing, one to twelve hours. Prerequisite(s): upper-division standing and consent of instructor. Intern assigns assignments in major political offices. Students will work as participants and be responsible as observers for theoretical as well as substantive analyses of political behavior and the policy process. May be repeated for up to 16 units.

POSC 199. Senior Research. (1-4) Outside research, three to twelve 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, three hours; outside research, three 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, three hours; outside research, three 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 Qualitative Methods. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): POSC 201 or approval of department graduate committee. Introduction to 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, three hours; outside research, three 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 approach to social science.

POSC 204. Mathematical Modeling in Political Science. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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, three hours, extra reading, three hours. Prerequisite(s): graduate standing 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 science 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, three hours; outside research, three 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 209. Introduction to Formal Theory. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Introduces the student to formal theory in political science. Topics covered include utility theory, normal and extensive form games, equilibrium concepts, incomplete information games, public goods, social choice, spatial voting models, and the role of institutions.

POSC 212. Political Theory. (4) Lecture, three hours; outside research, three 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 216. International Relations. (4) Lecture, three hours. Prerequisite(s): consent of instructor. Historical development and present range of political thought on relations among the states and their implications of the idea of sovereignty, the theory of an international community, theories of imperialism. The analysis of selected contemporary problems—bipolarity, emerging nations, alliance systems in the light of recent contributions international relations theory.
POSC 217. Comparative Politics. (4) Lecture, three hours. Survey and introduction to comparative politics with emphasis on major ideas, trends, and issues in the field. Critical assessment of theories on systems, political culture, development and underdevelopment, and elites.

POSC 250. Seminar in Politics and the Legal Order. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three 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, three hours; individual study, three 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 theoretical and empirical aspects of allegiances particular to the administrative state of policy development.

POSC 253. Constitutional Law. (4) Seminar, three hours; outside research, three 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 complex legal cases focusing on 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, three 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, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three 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, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Congregational 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, three hours; outside research, three 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 roles and the public policy process.

POSC 260. Economics and Elections. (4) Seminar, three hours; outside research, three 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 campaign events and information are also considered.

POSC 261. American Political Institutions. (4) Seminar, three hours; outside research, three 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, three hours; outside research, three 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 campaign events and information are also considered.

POSC 271. Comparative Political Economics. (4) Seminar, three hours; outside research, three 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 272. Parties and Party Systems in Western Europe. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines 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 273. Rational Choice in Comparative Politics. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines the role of the armed forces in political society, covering western-democratic, communist, post-communist, 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 274. The Armed Forces and Politics. (4) Seminar, three hours; outside research, three 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 275. Protest and Revolution. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines the role of the armed forces in political society, covering western-democratic, communist, post-communist, 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. War Termination and Conflict Resolution. (4) Seminar, three hours; outside research, three 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 campaign events and information are also considered.

POSC 277. Asian Political Economy in Comparative Perspective. (4) Seminar, three hours; outside research, three 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 278. Seminar in Latin American Politics. (4) Seminar, three hours. Critical examination of fundamental issues of Latin American politics with attention to learning interpretation and approaches to the study of Latin American societies, elites, and politics. Empirical studies and research in selected topics that concern the making of foreign policy and the roles of force and diplomacy.

POSC 279. Asian Political Economy in Comparative Perspective. (4) Seminar, three hours; outside research, three 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 280. Seminar in Political Theory. (4) Seminar, two or three hours. Prerequisite(s): consent of instructor. A detailed study at an advanced level of political theories and concepts, and the writings of the major theorists, confined to some selected era or limited to some selected major theme.

POSC 281. Seminar in the History of Political Thought. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Advanced study of the methodology and practice of research in the history of political thought.

POSC 284 (E-Z). Special Topics Seminar. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Covers a single topic not contained in a regular course. Announcement of each topic is made at the time of offering.

POSC 285. Professional Research Paper. (4) Outside research, twelve 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 with 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) Variable hours. Prerequisite(s): 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). May be repeated up to a total of 16 units. Does not count toward the unit requirement for the master's degree.

POSC 292. Concurrent Analytical Studies. (2-4) Research, eight to sixteen 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 throughout the quarter. POSC 114, POSC 142 (E-Z), POSC 185, POSC 186, and POSC 190 through POSC 190 may not be used for this course arrangement. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

POSC 293. Research Topics in Political Science. (1) Lecture, two hours. Lectures and discussions by invited scholars and faculty on selected research topics in political science. Three units required for Master's level students and 4 units required of doctoral level students. Graded Satisfactory (S) or No Credit (NC).

POSC 297. Directed Research. (1-6) Outside research, three to eighteen 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, one hour; practicum, three 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, two to eight hours; consultation, one to four 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.

PSYCHOLOGY

Subject abbreviation: PSYC

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Arlo K. Myers, Ph.D.
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Associate Professors
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Daniel J. Ozer, Ph.D.
Lawrence D. Rosenblum, Ph.D.

Assistant Professors
Dale J. Barr, Ph.D.
Ruth K. Chao, Ph.D.
Michael A. Erickson, Ph.D.
Sabine E. French, Ph.D.
Peter W. Hickmott, Ph.D.
Sonja Ilybomirsky, Ph.D.
Chandra A. Reynolds, Ph.D.

Cooperating Faculty
Robert C. Callie, 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 educational 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.

The department offers a minor in Psychology and a major in Psychology/Law and Society.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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

The Psychology major requires early, satisfactory completion of certain lower-division requirements. The lower-division requirements listed below must be completed by the end of the sophomore year, with an average grade of "C" or better, with no grade below a "C-"., and before upper-division Psychology courses are taken. All courses must be taken for a letter grade. 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.

The major requirements for the B.A. degree in Psychology are as follows:

1. Lower-division requirements (36 units)
   a) One course in Mathematics, Statistics, or Computer Science
   b) One course in biological sciences chosen from BIOL 002 or both BIOL 005A and BIOL 051A, BIOL 003 or BIOL 005B, BIOL 005C, BIOL 034
   c) One course in physical science chosen from
      (1) CHEM 001A, CHEM 001B, CHEM 001C, CHEM 003
      (2) PHYS 002A, PHYS 002B, PHYS 002C, PHYS 007, PHYS 008, PHYS 020, PHYS 021, PHYS 040A-PHYS 040B-PHYS 040C

POPULATION BIOLOGY

The interdepartmental Ph.D. program in Population Biology is not currently accepting new students. For further information call (800) 735-0717 or (909) 787-5621.
(3) Any Geosciences courses except for cultural geography courses  
d) Two additional courses from a), b), or c) above  
e) PSYC 001, PSYC 002, PSYC 011, PSYC 012  

2. Upper-division requirements (36 units)  
a) PSYC 110 or CBNS 106  
b) PSYC 140, PSYC 150  
c) PSYC 152 or PSYC 134  
d) PSYC 160A/HMDV 160A  
e) Four additional 4-unit, upper-division Psychology courses. Only one quarter of EDUC 106/HMDV 106/PSYC 106 and only one 4-unit quarter of PSYC 198G may be included. No 190-series courses other than PSYC 198G 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.  

Sample Program  
This sample program provides a curriculum for the Psychology student who does not need remedial English or remedial Math, and does need four quarters of a foreign language.  

| Freshman Year | ENGL 001A, ENGL 001B, ENGL 001C | 4 | 4 | 4 |  
| PSYC 001, PSYC 002 | 4 | 4 |  
| Mathematics, Statistics, or Computer Science | 4 |  
| Physical Science | 4 |  
| Social Sciences | 4 |  
| Humanities elective | 4 |  
| Total Units | 12 | 12 | 12 |  

| Sophomore Year | PSYC 011, PSYC 012 | 4 | 4 |  
| Biology | 4 |  
| Science course | 4 | 4 |  
| Foreign Language 1, 2, 3 | 4 | 4 | 4 |  
| Social Science | 4 | 4 |  
| Fine Art | 4 |  
| World History | 4 |  
| Total Units | 16 | 16 | 16 |  

| Junior Year | Foreign Language | 4 |  
| PSYC 110 or CBNS 106, PSYC 140, PSYC 150 | 4 |  
| PSYC 152 or PSYC 134 | 4 |  
| Political Science or Economics | 4 |  
| Literature, Philosophy, or Religious Studies | 4 | 4 |  
| Electives | 4 | 4 | 4 |  
| Total Units | 16 | 16 | 16 |  

| Senior Year | Psychology Electives | 8 | 8 | Electives 8 | 8 | 16 |  
| Total Units | 16 | 16 | 16 |  

Psychology/Law and Society Major  
1. All requirements for the B.A. in Psychology (36 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) IWSO 100  
c) One course chosen from ECON 111, PSYC 012, SOC 110A, POSC 114 (or equivalent course in research methods)  
d) Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159 (One of these courses may be replaced by a substitute choice from a list of courses published annually by the Law and Society Faculty Committee. Not more than two of the courses taken to meet this requirement [2.d] may be from the same department.)  
e) IWSO 193, Senior Seminar  
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 grade of “C” or better, with no grade below a “C-“.  
Requirements for the Psychology minor are as follows (20 units):  
1. Twenty (20) upper-division Psychology units  
a) PSYC 110 or CBNS 106  
b) PSYC 132 or PSYC 134  
c) PSYC 140 and PSYC 150  
d) PSYC 160A/HMDV 160A  
See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.  

Psychology Undergraduate Honors Program  
The purpose of the Psychology Department’s Undergraduate Honors Program is threefold: to allow junior- and senior-level Psychology, Human Development, and Neuroscience majors with qualifying GPAs to work intensive-ly with a faculty member on a specific research project and thesis; to provide seminars by our faculty and others on current issues and research in psychology; and to assist in preparation for graduate school.  
In general, students should be able to participate for at least four, and preferably six, quarters during the junior and/or senior years.  

Students are encouraged to start Honors enrollment in fall quarter.  
All interested students who believe they are eligible may request an application from Psychology Student Affairs. The application should be submitted in the quarter in which 86 units will be completed.  

Prerequisites  
1. Completion of a minimum of 86 units prior to the first quarter in the program  
2. Course requirements  
a) PSYC 011 with grade “B+” or better  
b) PSYC 012 with grade “B+” or better  
3. Minimum GPA requirements (or consent of director)  
a) 3.50 cumulative GPA  
b) 3.50 major GPA (include PSYC 011 and PSYC 012, exclude courses numbered in the 190s)  
4. Ability to participate for a minimum of four continuous quarters  

Requirements  
1. Participation in the program for a minimum of four continuous quarters  
2. Attendance at all Psychology Department colloquia  
3. Completion of the following course requirements  
a) Junior year  
(1) PSYC 192H, Seminar (all quarters)  
(2) PSYC 198H, Research (second and third quarters)  
b) Senior year  
(1) PSYC 193H, Seminar (all quarters)  
(2) PSYC 199H, Research (2 units, first and second quarters)  
(3) PSYC 195H, Thesis (third quarter)  
4. Submission of an independent thesis in the fifth week of last quarter of senior year  
5. Poster session presentation near the end of the last quarter of the senior year  

Education Abroad Program  
The Psychology Department encourages eligible students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at
GRADUATE PROGRAM

Graduate training in psychology is offered in four major areas: Cognitive, Social/Personality, Developmental, and Systems Neuroscience. Students entering the graduate program are normally expected to have completed the equivalent of an undergraduate major in Psychology at the University of California, 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. Applications are not accepted from students wishing to work towards the master's degree only. Students are required to demonstrate the ability to complete rigorous empirical research and are expected to 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 Program Requirements

The courses normally required during the first two years include

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
   - Developmental — PSYC 207A, PSYC 207B, PSYC 207C, PSYC 208
   - Social/Personality — PSYC 225, PSYC 226, PSYC 227, PSYC 228
   - Neuroscience — NRSC 200A/PSYC 200A, NRSC 200B/PSYC 200B, NRSC 200C/PSYC 200C

3. Four additional courses or seminars outside the student's area of specialization to acquire breadth. The breadth requirement is flexible in order to provide a choice of courses suitable for students in the different specialization areas within the department. Courses can be in the Department of Psychology or in another department. They must be regular 3- or 4-unit courses or seminars, and at least one of the four courses must be a departmental core course (listed in 2, above) outside the student's area of specialization. Psychology courses in the student's area of specialization offered by other departments will typically not be approved.

For a course to satisfy the breadth requirement, approval prior to enrollment must be obtained from all the faculty in the student's area of specialization or from a three-member advisory committee in the student's area. Exceptions to the “prior approval” rule are granted to students who have completed graduate-level course work prior to entering the UCR program. Students may request that specific courses be accepted toward satisfaction of the breadth requirement. This request is reviewed by the student's area faculty, who use procedures and standards typically applied to the preapproval of breadth courses.

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-”.

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 four breadth 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 is required to 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.

Qualifying Examination

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.

Advancement to Candidacy

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, call (909) 787-5386 or write and request a departmental brochure and application.

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 requirements:

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 Curricula and Courses section of this catalog.

LOWER-DIVISION COURSES

PSYC 001. Introductory Psychology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. 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, three hours; discussion, one hour. Prerequisite(s): none. Emphasizes topics in developmental psychology, tests and measurements, social psychology, personality, and abnormal behavior.

PSYC 011. Psychological Methods: Statistical Procedures. (4) Lecture, three hours; discussion, two hours. Prerequisite(s): PSYC 001 and PSYC 002, each with a grade of "C-" or better. Descriptive and inferential statistics, measures of central tendency, variability, and correlation; introduction to sampling distributions, statistical inference and hypothesis testing.

PSYC 011L. Psychological Methods: Computers and Statistical Procedures. (1) Laboratory, three hours. Prerequisite(s): PSYC 001 or concurrent enrollment. Computer laboratory exercises covering data management, score transformations, and basic descriptive and inferential statistics as used in psychological research. Graded Satisfactory (S) or No Credit (NC). Credit is not allowed for PSYC 011 if PSYC 011L has been completed with a grade of "C-" or above.

PSYC 012. Psychological Methods: Research Procedures. (6) Lecture, three hours; laboratory; three hours; outside research, three hours; extra reading, two hours; term paper, one hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, each with a grade of "C-" or better; ENGL 010C or equivalent with a grade of "C-" or better; consent of instructor is required for students repeating the course. 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 049 (E-Z). Topics in Psychology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. Each segment explores a topic of general interest in psychology. Topics are announced in the Schedule of Classes.

PSYC 096. Research for Lower-Division Students. (1-2) Scheduled research, three to six 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) only. Course is repeatable to a maximum of 6 units.

UPPER-DIVISION COURSES

PSYC 106. Practicum in Child Development. (4) Lecture, three hours; practicum, three hours. Prerequisite(s): upper-division standing; consent of instructor required for students repeating the course. Introduction to sociocultural perspectives of child development. Topics include sociocultural theories of development, motivation- and skill-based learning, technology in education, and school-home linkages. Application of child development theories and research related to them takes place during fieldwork assignments in an afterschool, computer-based program for elementary school students. Course is repeatable. Cross-listed with EDUC 100 and HMDV 106.

PSYC 109. Advanced Research Methods. (4) Lecture, three hours; laboratory, three 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 with a focus on 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, three hours; discussion, one 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 CNS 120/PSYC 120 or PSYC 110.

PSYC 120. Cellular Neuroscience: Membrane and Synaptic Phenomena. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CNS 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 CNS 120.

PSYC 120L. Neuroscience Laboratory. (2) Lecture, one hour; laboratory, three hours. Prerequisite(s): CNS 120 or concurrent enrollment. Laboratory experiments using anatomical, chemical, and physiological research methods fundamental to understanding neurons and neural systems. Cross-listed with CNS 120L.

PSYC 124. Systems Neuroscience. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CNS 106 or consent of instructor. Study of the structure and function of motor, sensory, and motivational systems in vertebrate and invertebrate nervous systems. Cross-listed with CNS 124.

PSYC 125. Neuropharmacology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CNS 120/PSYC 120 or equivalent or consent of instructor. Examines synaptic neurotransmitter systems, mechanisms, and pharmacological agents and effects, which are fundamental to neural information processing. Cross-listed with CNS 125.

PSYC 126. Neurobiology of Learning and Memory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CNS 120/PSYC 120 or consent of instructor. Covers recent research and advances in the understanding of the physiological, anatomical, and biochemical basis of information acquisition and retention in nonhuman and human brain. Cross-listed with CNS 126.

PSYC 127. Behavioral Control Systems. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CNS 120/PSYC 120; CNS 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 CNS 127.

PSYC 129. Human Neuropsychology. (4) Lecture, three hours; discussion, one and one-half hours. Prerequisite(s): CNS 106 or PSYC 110 or PSYC 132 or PSYC 134 or HMDV 135/PSYC 135 or consent of instructor. 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. (4) Lecture, three hours; discussion, one 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 theories of the role played by sensory mechanisms, experiences, expectations, and needs in recognizing objects in the environment.

PSYC 133. Human Factors. (4) Lecture, three hours; extra reading, two hours; term paper, one hour. Prerequisite(s): PSYC 150 or PSYC 152 or PSYC 154 or consent of instructor. Provides an overview of the human capabilities and limitations considered in the design of person-machine systems. Factors critical to performance in person-machine systems, including attention, decision making, motor performance, and memory, are evaluated.

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PSYC 134. Cognitive Processes. (4) Lecture, three hours; discussion, one 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, memory, 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, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, each with a grade of "C-" or better; or equivalents; or consent of instructor. 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. Cross-listed with HMDV 135.

PSYC 139. Topics in Cognitive Psychology. (4) Seminar, three hours; extra reading and written work, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 130 or PSYC 132 or PSYC 134 or HMDV 135/PSYC 135, or consent of instructor. Intensive study in cognitive psychology. Literature, methodology, and experimental design and analysis are stressed. Course is repeatable to a maximum of 16 units.

PSYC 140. Social Psychology. (4) Lecture, three hours; discussion, one 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 141. Nonverbal Communication in Human Social Interaction. (4) Lecture, three hours;
term paper, three hours. Prerequisite(s): PSYC 011 and PSYC 140. The role of facial expressions, tone of voice, body movements, and proxemics in social interaction, including such topics as perception, embodied cognition, power cues, gender, and the nonverbal detection of deception.

PSYC 142. Industrial/Organizational Psychology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 002. Introduction to the field of industrial/organizational psychology covering fundamental theory and research in personnel and organizational behavior. Topics include employee selection and training, performance appraisal, motivation, organizational dynamics, leadership, and job satisfaction.

PSYC 146. Primate Social Behavior. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ANTH 002 or ANTH 002H or PSYC 002. A consideration of 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, three hours; extra reading, three hours; or term paper, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 140; or equivalents; or consent of instructor. Introduction to 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 150. Personality. (4) Lecture, three hours; discussion, one 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 research on which the theories are based.

PSYC 151. Abnormal Psychology. (4) Lecture, three hours; discussion, one 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, psychotic disorders, sexual disorders, drug and stress induced states, and organic disorders.

PSYC 153. Introduction to Clinical Psychology. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 150; or equivalents; or consent of instructor. Introduction to the field of clinical psychology with an emphasis on the application and evaluation of techniques of individual and group counseling and therapy; the application and evaluation of psychological tests in the assessment of psychological problems.

PSYC 154. Philosophy of Psychology. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): one course in philosophy or upper-division standing in Psychology or consent of instructor. Examines philosophical issues arising in the context of empirical psychology. Topics include moral development; artificial intelligence and the modeling of cognition; the nature of perception and memory; fallacies in human reasoning; mechanisms of the self as a changing and mental entity. Cross-listed with PHIL 155. Credit is awarded for only one of PHIL 155/PSYC 154 or PHIL 255.

PSYC 155. Personality Assessment. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 150; or equivalents; or consent of instructor. Covers the assessment of personality through self-report tests, projective techniques, 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, three hours; term paper, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012, PSYC 140 or PSYC 150 (preferably both); or equivalents; or consent of instructor. "Person perception" refers to the impressions we have about the persons and groups we interact with. This course examines the topic from the viewpoints of both personality and social psychology. The course will focus on (1) the processes by which we all judge personality in our daily lives and (2) the way such judgments are erroneous and inaccurate.

PSYC 160A. Development in Infancy and Childhood. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. An overview of the developmental process from the prenatal period to late childhood. Concerns physical growth as well as development in the motor, perceptual, cognitive, emotional, and social areas. Cross-listed with HMDV 160A.

PSYC 160B. Development in Adolescence and Adulthood. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; HMDV 160A/PSYC 160A; or equivalents; or consent of instructor. An introduction to the biological, social, and cognitive processes that influence development beyond childhood. Discusses contemporary theoretical approaches to the study of stability and change in adolescence and adulthood. Topics include physical maturation, personality, social roles and relationships, and coping and adjustment. Cross-listed with HMDV 160B.

PSYC 161. Personality Development. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Study of the development of human personality from birth through late adolescence. Emphasis is on the impact of interpersonal relationships on the acquisition of human traits, emotional reactions, and patterns of adjustment. Cross-listed with HMDV 161.

PSYC 163. Cognitive Development. (4) Lecture, three hours; discussion, one 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 intellectual development of the child from birth to maturity, mechanisms of intellectual growth, and the relationship between development and cognitive development. Cross-listed with HMDV 163.

PSYC 165. The Cultural Bases of Human Development. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, 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. Cross-listed with HMDV 165.

PSYC 166. Adolescent Development. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; or equivalents; or consent of instructor. Examines individual and relational development from early adolescence into young adulthood. Emphasis is on the mutual influences of family relationships and adolescent development as well as on the linkages between family, peer group, school experience, and the broader socio-cultural context of development. Topics include the psychosocial impact of puberty, cognitive change, and socioemotional adjustment during adolescence. Cross-listed with HMDV 166.

PSYC 167. Psychological Development of Black Children. (4) Lecture, three hours; extra reading, three 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 168.

PSYC 168. Psychological Aspects of the Black Experience. (4) Lecture; three hours; extra reading, three 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 setting and 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, three hours; extra reading, three hours. Prerequisite(s): PSYC 001, PSYC 002, PSYC 011, PSYC 012 with grades of "C-" or better; HMDV 160/PSYC 160A; or equivalents; or consent of instructor. In-depth study in developmental psychology. Exploratory, methodological, and research design and analysis is stressed. Specific course content varies. Course is repeatable to a maximum of 10 units.

PSYC 175. Psychology and Law. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): PSYC 001 and PSYC 002 with grades of "C-" or better; or consent of instructor. Exploration 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, competency, rehabilitation and punishment, ethics and legal responsibilities in therapy, and psychological research.

PSYC 178. Health Psychology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BMSC 103 or PSYC 002 or SOC 001. An examination of the importance of interpersonal relationships to physical health and effective medical care. Social psychological perspectives are applied to such topics as stress-related diseases, placebo effects, doctor-patient interactions, dying, and the hospital environment.

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, two hours. Prerequisite(s): PSYC 001 and PSYC 002 with grades of "C-" or better; or consent of instructor. Intensive study in 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, two 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, two 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, two 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, two 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, two 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; and peer exchanges. Graded (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, two 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. Graded (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 6 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 195H. Senior Honors Thesis. (2) Term paper, six 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. Graded Satisfactory (S) or No Credit (NC) grading is not available.

PSYC 197. Research for Undergraduates. (1-4) Individual research, three to twelve 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, one hour; internship, four to ten hours; written assignments, two to four 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, six 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. Graded Satisfactory (S) or No Credit (NC) grading is not available. Course is repeatable to a maximum of 4 units.

PSYC 198T. Counseling Skills. (1) Lecture, one 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, three to fifteen 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/No Credit grading. Course is repeatable to a maximum of 16 units.

PSYC 200A. Fundamentals of Neuroscience. (3) Lecture, three 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 NSRC 200A.

PSYC 200B. Fundamentals of Neuroscience. (3) Lecture, three hours. Prerequisite(s): graduate standing or consent of instructor. Fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NSRC 200B.

PSYC 200C. Fundamentals of Neuroscience. (3) Lecture, three hours. Prerequisite(s): graduate standing or consent of instructor: NSRC 200B/PSYC 200B. The fundamentals of neuroscience in molecular and cellular mechanisms, neural and hormonal systems, and neural control of behavior. Cross-listed with NSRC 200C.

PSYC 203A. Experimental Psychology. (3) Lecture, three 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, three 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, three 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, three hours. Graded Satisfactory (S) or No Credit (NC). Course may be repeated.

PSYC 207B. Social Development. (3) Lecture, three hours. Prerequisite(s): consent of instructor. Theoretical and empirical considerations of 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, three 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, three hours. Prerequisite(s): consent of instructor. This course will develop students' skills in formulating appropriate 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 211. Statistical Inference. (4) Lecture, three hours; discussion, one hour; laboratory, two 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, three hours; discussion, one hour; laboratory, one 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, three hours; discussion, two hours. Prerequisite(s): graduate standing in Psychology, PSYC 211, or consent of instructor. Multiple regression and analysis of variance including repeated measures and mixed designs, with special attention to exploratory data analyses, nested designs, interactions, and contrasts.

PSYC 225. Theories and Concepts of Social Psychology. (3) Lecture, three 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, three hours. Prerequisite(s): consent of instructor. Advanced critical review of the theories, assessment techniques, and empirical literature in personality psychology. Special attention given to the interactionist perspective. Required of all social-personality graduate students.

PSYC 227. Research Methods in Social Psychology. (3) Lecture, three hours. Prerequisite(s): consent of instructor. Laboratory and field research methods with special attention to subject and experimenter artificats and effects. Special issues include social research and publication and research ethics.

PSYC 228. Research Methods in Personality. (3) Lecture, three hours. Prerequisite(s): graduate standing or consent of instructor. Methods of personality research with an emphasis upon the methods psychologists can use to assess personality. Attention to data analytic methods and theoretical content is included.

PSYC 252. Seminar in Cognitive Science. (2) Seminar, two hours. Prerequisite(s): graduate status or consent of instructor. Analysis of selected current research in cognitive sciences. Research emphasizing cognitive approaches to problems in learning, memory, motivation, and perception, including developmental and comparative aspects of these problems, will be discussed. Graded Satisfactory (S) or No Credit (NC). May be repeated.

PSYC 255. Seminar in Social Psychology. (3) Seminar, three 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 may be repeated.

PSYC 256. Seminar in Perception. (3) Seminar, three 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, three 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, three hours. Prerequisite(s): consent of instructor. Selected advanced topics in developmental psychology. Graded Satisfactory (S) or No Credit (NC). May be repeated.

PSYC 259. Seminar in Quantitative Methods. (3) Seminar, three 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. Content varies. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**PSYC 262. Developmental Biopsychology.** (3) Lecture, three 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 grade.

**PSYC 263. Seminar in Physiological Psychology.** (3) Seminar, three 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 264. Current Research in Psychological Psychology.** (2) Seminar, two hours. Prerequisite(s): graduate standing or consent of instructor. Review and discussion by students and faculty of contemporary research findings relevant to the ongoing research area of one of the departmental faculty. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 36 units. Asher, Stanley, Wilson

**PSYC 265. Current Research in Developmental Psychology.** (2) Seminar, two hours. Prerequisite(s): consent of instructor. Discussion of selected research topics in developmental psychology. Emphasis upon contemporary research findings relevant to the ongoing research area of one of the developmental faculty. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 270. Current Research in Quantitative Psychology.** (2) Seminar, two hours. Prerequisite(s): consent of instructor. Discussion of selected research topics in quantitative psychology. Emphasis on contemporary research design and quantitative problems relevant to the ongoing 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, three hours. Prerequisite(s): consent of instructor. Discussion of issues in cognitive psychology. Emphasis upon current research findings relevant to the ongoing research area of one of the cognitive faculty. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 280. Current Research in Social Perception and Communication.** (2) Seminar, two hours. Prerequisite(s): consent of instructor. Analysis and discussion of ongoing research on face-to-face interaction, social perception, and nonverbal communication. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 282. Current Research in Personality Psychology.** (2) Seminar, two hours. Prerequisite(s): consent of instructor. Discussion of selected research topics in personality psychology. Emphasis upon contemporary research findings relevant to the ongoing research area of one of the personality faculty. Graded Satisfactory (S) or No Credit (NC). May be repeated.

**PSYC 287. Colloquium in Neuroscience.** (1) Colloquium, one hour. Prerequisite(s): graduate standing or consent of instructor. Oral reports on current research topics in neuroscience with presentations by visiting scholars, faculty, and students. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with BCH 287, BIOL 287, BMSC 287, CHEM 287, and NSRC 287.

**PSYC 289. Special Topics in Neuroscience.** (2) Seminar, two 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. Letter grades will be assigned to students presenting formal seminars; others will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**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) Research, 3 to 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 36 units; units do not count beyond the Master’s Degree.

**PSYC 292. Concurrent Analytical Studies.** (1-4) Research, two to eight 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, three hours; outside research, three hours; extra reading, three hours; extra writing, three 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.** (1-4) Prerequisite(s): consent of instructor. Minor research studies or minor research findings relevant to the ongoing research area of one of the faculty. 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.

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**PROFESSIONAL COURSE**

**PSYC 301. Teaching Psychology at the College Level.** (2) Seminar, one hour; practicum, three 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.

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**RELIigious Studies**

Subject abbreviation: RLST

Joel W. Martin, Ph.D., Chair
Department Office, 1609 Humanities and Social Sciences; (909) 787-3612
religion@ucr.edu

Professors
Joel W. Martin, Ph.D. (Religious Studies/History)
Ruperta Costa Chair in American Indian Affairs
June E. O’Connor, Ph.D.
Brian K. Smith, Ph.D.
Ivan A. Strenski, Ph.D. Holstein Family and Community Chair in Religious Studies

Professors Emeriti
Francis H. Cook, Ph.D.
Douglas M. Parrott, Ph.D.

Associate Professor
Vivid-Lee Nylasr, Ph.D.

Assistant Professors
Michael Feener, Ph.D.
Andrew Jacobs, 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. Religion has always played a crucial role in human history, thought, and culture and continues to do so today. Students can examine the texts, symbols, myths, rituals, ideas, values, and ethical systems of many religious traditions, such as Judaism, Christianity, Islam, Hinduism, Buddhism, 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 number of valuable and transferable skills. These skills 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. The study of religion enables students to become well informed and independent thinkers, prepared to engage in fact finding research, to collect and organize ideas, and to analyze and make judgements which are required by any profession or position. 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 Rupert Costa Chair in American Indian Affairs**
The Rupert Costa Chair in American Indian Affairs 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. Joel Martin, 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.

**Degree Requirements**

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.
College Requirements
See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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 or related courses in other programs or departments (A list of courses is available in the Religious Studies office, and other courses are considered with approval by the Chair.)

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 are expected to 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

2. Upper-division requirements (40 units)
   a) Art History (16 units): AHS 140, AHS 141, AHS 143, AHS 155, AHS 156, AHS 157, AHS 159, AHS 161, AHS 162, AHS 163, AHS 164, AHS 171, AHS 172, 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, RLST 172
   c) Religious Studies (4 units): RLST 005

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 163, 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 104, RLST 105, 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, RLST 171, RLST 172
   c) One additional 4-unit course in Religious Studies

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 163, 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, RLST 171, RLST 172

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

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 Undergraduate Studies Section of this catalog for additional information on minors.

Education Abroad Program
The Religious Studies Department encourages students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. Because strategy in choosing courses to be taken here and courses to be taken abroad varies depending on personal goals and the country visited, early planning is advised. Consult the department advisor for assistance.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

Accelerated M.A. Program at Claremont Graduate School
An accelerated M.A. Program in Religion is available at the nearby Claremont Graduate School (CGS) for qualifying UCR Religious Studies majors. The program enables those accepted to complete the M.A. in religion at the CGS with no more than one year of study after receiving the B.A. degree at UCR. Students accepted are able to enter the CGS M.A. program in their senior year and have up to 8 UCR upper-division quarter units counted toward the M.A. At the same time, up to 8 CGS semester units may be credited toward the completion of both the UCR B.A. and the CGS M.A. programs. Further details are available in the Religious Studies Office.
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hour; extra reading, three hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. Honors course corresponding to RLST 015. 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 one of Rlst 005 or Rlst 005H.

RLST 007. Introduction to Western Religions. (4) Lecture, three hours; discussion, one hour. An introductory survey of Judaism, Christianity, and Islam. Emphasis is placed on distinguishing characteristics, major ceremonies, foundation texts, and historical interactions.

RLST 010. Introduction to the Bible. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. A preparation for informed study of the Bible. Examines contemporary interpretive stances, history, methods, and major themes. Significant portions of the Bible are studied in the process.

RLST 011. Modern Christianities and World Cultures. (4) Lecture, three hours; discussion, one hour. Examines the many expressions of Christianity in diverse cultural locations: New England, the South (among African Americans), and other parts of the American period, New Spain (Mexico and the Caribbean), South Africa, and Korea.

RLST 012. Religious Myths and Rituals. (4) Lecture, three hours; discussion, one 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. Religious beliefs and expressions are examined from diverse cultural perspectives. Source materials are drawn from indigenous Native (North and South) American, African American, and/or Asian American religions. Cross-listed with ESt 012. Credit is awarded for one of ESt 012/RLST 012 or ESt 012H/RLST 012H.

RLST 012H. Honors Religious Myths and Rituals. (4) Lecture, three hours; discussion, one hour; extra reading, three hours. Prerequisite(s): admission to the University Honors Program or consent of instructor. 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. Source materials are drawn from indigenous Native (North and South) American, African American, and/or Asian American religions. Cross-listed with ESt 012H. Credit is awarded for only one of ESt 012/RLST 012 or ESt 012H/RLST 012H.

RLST 014. Religion and Science. (4) Lecture, three hours; discussion, one hour. Introduction to major themes in the relation of science and religion. Primary focus is on the role of Western science and science, but attention is also paid to particular problems encountered by Buddhism and Hinduism. Topics include creationism and Darwinian evolution; modern cosmology and the significance of earthly life; and the trial of Galileo.

RLST 015. Death. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. Investigates the psychological aspects of facing death and dealing with dying persons; cross-cultural and religious philosophical interpretations of death and dying; attitudes toward 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) Seminar, three hours; individual research, three hours. 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 death; and issues 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 and RLST 015H.

RLST 024. Introduction to Native American Culture and Religion. (4) Lecture, three hours; discussion, one 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 044. Gods, Ghosts, and Grandparents. (4) Lecture, three hours; discussion, one 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.

RLST 100. The Problem of Religion. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): one Religious Studies course or upper-division standing or consent of instructor. Survey of critics and defenders of the idea of religion who debate meanings and functions of religions 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, three hours; individual study, three 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, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of contemporary religious 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 commitments.

RLST 103. Confucianism. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): one of 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 105. Religions of Japan. (4) Lecture, three hours; individual study, three 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, three hours; individual study, three 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, three hours; individual study, three hours. Prerequisite(s): one of 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 traditions, their relationships to each other, and their expression in Chinese culture and civilization. Topics include the Tao Te Ching, the Ch’ang-chu Tao, the Taoist Canons, mediation, immortality, alchemy, and ritual. Cross-listed with AST 107 and CHN 107.

RLST 108. Modern Hinduism. (4) Lecture, three hours; extra reading, three 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, three hours; individual study, three 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 111. Islam. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines 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 112. Islam and the West. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines assumptions about Islam and the “West” with a special eye towards critically examining stereotypes. Selected topics such as the media, immersion, and politics of salient factors in the construction of the relationship between Islam and the West are addressed.

RLST 113. Topics in Modern Islam. (4) Lecture, three hours; individual study, three 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 114. Tabu and Sacred in Time and Space. (4) Lecture, three hours; field, eight hours per quarter; written work, three hours. Prerequisite(s): upper-division standing or consent of instructor. A cross-cultural inquiry into ideas of tabu and the sacred in traditional and contemporary religious traditions, such as ancient Hawaiian religion, Puritanism, Krishna devotionalism, and Roman Catholicism. Readings are from Durkheim, Eliade, and Otto. Applies theory to field observation and discusses the sacred in everyday life in music, cinema, literature of transgression, and politics.

RLST 115. Religious Fundamentalism. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the worldwide “fundamentalist” movement of the nineteenth and twentieth centuries, concentrating on materials from Protestant Christianity in America, Islam in the Middle East, Hinduism in India, and Judaism in Israel.

RLST 116. Religion and Violence. (4) Lecture, three hours; extra research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the capacity of religion to mobilize and legitimate vio-
ence. 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A comparative study of mythic traditions from several world cultures and religious views from a variety of theoretical perspectives. Includes material drawn from epic, 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 WRLT 112.

RLST 118. The Problem of Evil: Understanding Evil and Its Manifestations. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of the collection of books usually given to the perpetrator, and the voyeur, and in a variety of media such as fiction, nonfiction, and film.

RLST 119. Sacrifice. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. An analysis and survey of sacrifice as a category of ritual and as a concept with broad application. Materials are drawn from a wide range of Eastern and Western religious sources, both ancient and modern.

RLST 121. The Hebrew Bible/Old Testament. (4) Lecture, three hours; individual study, three 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 TVC 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) Lecture, three hours; assignment of the remaining hours varies from segment to segment. 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 construction of underground religion upon the development of Judaism and the impact of its mysticism and the phenomenon of underground religion upon the development of Judaism in the Jewish diaspora from 330 BCE to 500 CE.

RLST 124F. Jewish Theology and Mysticism, Seventh to Seventeenth Centuries. (4) Lecture, three hours. Prerequisite(s): none. An introduction to the major themes of Jewish religious thought and the impact of its mysticism and the phenomenon of underground religion upon the development of Judaism and the impact of its mysticism and the phenomenon of underground religion upon the development of Judaism in the Jewish diaspora from 330 BCE to 500 CE.

RLST 124G. Modern Jewish Thought: Classical Sources and Modern Influences. (4) Lecture, three hours; consultation/reading, one hour. Prerequisite(s): none. Major modern thinkers including Buber, Rosenzweig, Kaplan, and Heschel among others will be viewed in light of their inspirations from the Talmudic, philosophic, and mystical literatures of the Jewish past and in response to the impact of Christian and secular thought of the present.

RLST 124H. Prayer, Mysticism, and Magic. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. An examination of the interaction of normative and marginal Judaism in the post-biblical period as disclosed through an examination of Jewish prayer books, the great works of the Jewish mystical tradition, and magical texts.

RLST 124J. Varieties of Ancient Judaism. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the forms of postbiblical Judaism, giving an analysis of the religious-cultural, socioeconomic and political conditions in Palestine and in the Diaspora from 330 BCE to 500 CE.

RLST 124K. Zionism and Holocaust. (4) Lecture, three hours; consultation, one 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 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, three hours; individual study; three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of contemporary ways in which Jesus has been understood by academically oriented scholars. 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, three hours; outside research, three hours. Prerequisite(s): RLST 101; 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, three hours; individual study, three 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, three hours; extra reading, three 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 the Reimarus period to the present.

RLST 135. History of Christianity. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. History of Christianity from its origins to the twentieth century, with historical emphases determined by faculty expertise. Cross-listed with HIBE 130.

RLST 136. Augustine and Aquinas. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examination of selected writings by and about Augustine of Hippo (350–430) and Thomas Aquinas (1226–1274), whose works have had a major impact on Western religious, literary, 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, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor; HIST 2017A 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 HISH 122A.

RLST 137B. Religious Cultures in Modern America. (4) Lecture, three hours; term paper, three 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 HISH 122B.

RLST 138. Colonialism and Religions in Mexico. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. The survival, revival, and invention of religious traditions in ancient and contemporary Mesoamerica. Indigenous and immigrant religious traditions examined through a variety of themes: myths and rituals of pre-Columbian peoples; sexuality and eroticism in religion; Indian theology and theogony; Counter Reformation Catholicism; growing religious syncretisms.

RLST 139. African American Religions. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. An examination of a variety of African American religions, including religions developed in the Caribbean and Brazil; African religion in North America under slavery; African American churches and sects; the civil rights movement; and the relationship of religion to African American music and literature.

RLST 142. Chinese-Tzu. (4) Lecture, one hour; discussion, two hours; outside research, one hour; extra reading, one hour; term paper, one hour. Prerequisite(s): RLST 005 or RLST 005H or AST 107/CHIN 107/RLST 107 or consent of instructor. An examination of the history of Chinese-Tzu, a medieval Chinese tradition of 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 144. Buddhist Literature. (4) Lecture, two hours; discussion, one hour; term paper, three hours. Prerequisite(s): RLST 005 or RLST 005H or RLST 101 or RLST 105 or RLST 106 or consent of instructor. Readings in canonical Buddhist narratives and examination of the themes of emptiness and impermanence in Buddhist-inspired literature. Examples are drawn from classical and modern Asian prose and poetry as well as from the work of contemporary American authors. Cross-listed with CPLT 144.

RLST 151. Reading the Qur’an. (4) Lecture, three hours; term paper, three 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 160. Women and Religion. (4) Lecture, three hours; consultation, one 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 163. The Women of Early Christianity. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Studies the role of women in early Christianity. Cross-listed with WMST 163.

RLST 164. Native American Religions. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examinations scholarly approaches to the study of Native American religions and important dimensions of the religious
traditions of diverse Native American communities (Mus-kogees, Koyukon, Lakotas, Apaches, and others). Themes addressed include responses to historical change, ecological worldviews, moral systems, and the arts.

RLST 167. Religion and Film. (4) Lecture, three hours; scheduled screening, two hours; outside screening, one hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the intersections of film, religious meaning, and contemporary society.

RLST 170. Current Issues in Religious Ethics. (4) Lecture, three hours; individual study, three 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 171. Religion and Capitalism. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines religious foundations of market society. Compares market society to pre-capitalist societies. Special attention is given to the Weber thesis, social Darwinism, Marx/Mauss. The Grift, and public policy issues, such as acquisitiveness, altruism, competition, poverty, slavery, and wealth.

RLST 172. Individualism in Comparative Perspective. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. The emergence of the individual as a sacred being in the West, studied in comparison with notions of the human person characteristic of traditional Confucianism, Hinduism, and Shinto as well as the more recent case of Maoist thought in modern China. Buddhism as an indigenous Asian individualism.

RLST 173. Political Religions and Religious Politics. (4) Lecture, three hours; term paper, three 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 nationalism, sacral kingship, revolutionary asceticism, “throne and altar,” civil religion, militarism, 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, three hours; outside research, three 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, three hours; independent research, three 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, three hours; individual study, three 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, three hours; individual study, three 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 select religious traditions. Special attention is given to problems of interpretability and the medium of presentation in the communication of “religious” meaning. Cross-listed with WRIT 178.

RLST 184. Contemporary Christian Theologies. (4) Lecture, three hours; individual study, three 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) To be taken with consent of the chair of the program to meet special curricular problems.

RLST 191 (E-Z). Seminar in Religious Studies. (4) Seminar, three hours; assignment of the remaining hours varies from segment to segment. For hours and prerequisites, see segment descriptions. A series of seminars, normally interdisciplinary in character, whose topics will be announced in advance.

RLST 191 M. Nag Hammadi Texts. (4) Seminar, three hours; extra reading, one hour. Prerequisite(s): consent of instructor. Examination of hitherto unknown texts (in translation) discovered in Egypt in 1946, which go back to the first Christian centuries and throw considerable light on the New Testament and early church. Many are Gnostic.

RLST 191 Q. Theories and Methods in the Study of Religion (4) Seminar, three hours; extra reading, three hours. Prerequisite(s): upper-division standing. A survey of some of the major thinkers (Durkheim, Freud, Eliade, and Jonathan Z. Smith), influential theories (sociological, psychological, hermeneutical, and anthropological), and central questions (the definition of religion, ritual, and myth; the relationship of religion to magic and science) in the study of religion.

RLST 193. Senior Seminar. (4) Seminar, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Analysis of major religious documents from world religious traditions. Choice of texts, traditions, and key unify themes vary each year but typically focus on fundamental religious issues such as worldliness or otherworldliness, belief or unbelief, obedience or nonobedience, commitment and disaffiliation, attachment or nonattachment, 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, three to six 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, two to twelve hours; reading and writing, one to six 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.

RLST 302. Teaching Practicum. (1-4) Practicum, three to twelve 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.

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.

Adalberto Aguirre, Jr., Ph.D. Chair Program Office, 1225 Watkins Hall (909) 787-5507 socialrelations.ucr.edu

Committee in Charge Adalberto Aguirre, Jr. Ph.D. (Sociology) Scott L. Coltrane, Ph.D. (Sociology) Michael Kearney, Ph.D. (Anthropology) Patricia O’Brien, Ph.D. Dean, College of Humanities, Arts, and Social Sciences, ex officio

MAJOR

The major in Social Relations offers an integrated approach to the study of personality in society and culture. It provides a background in the theoretical and methodological contributions of anthropology, psychology, and sociology to those students whose future professional careers require a broad understanding of human behavior and social relationships.

Students can work toward a B.A. degree or a B.S. degree. The B.A. degree is most suitable for students who intend to enter one of the social service professions. The B.S. degree has a stronger emphasis on the acquisition of research skills. Students should work out a course of study in consultation with their advisors. Majors planning to enter graduate work in anthropology, psychology, or sociology are strongly advised to consult with the appropriate department regarding how best to prepare themselves.
All students are required to meet quarterly with the Program Advisor for counseling and consultation for purposes of developing a program of studies prior to course enrollment.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

The major requirements for the B.A. and B.S. degrees in Social Relations are as follows:

For the Bachelor of Arts

1. Lower-division requirements (12 units)
   a) ANTH 001
   b) PSYC 002
c) SOC 001

2. Upper-division requirements (52 units)
   a) Twelve (12) units in research methods, chosen from the following courses:
      ANTH 175A, ANTH 175B, ANTH 175C;
      PSYC 012; SOC 110A
   b) Four (4) units in statistics: PSYC 011 or SOC 110B
c) Thirty-six (36) elective units chosen from the following, including at least two courses in each of the areas of Anthropology, Psychology, and Sociology:
   1) ANTH 104, ANTH 106, ANTH 107, ANTH 120, ANTH 124, ANTH 125, ANTH 127, ANTH 131, ANTH 132, ANTH 133, ANTH 162, ANTH 165
   2) ETST 164, PSYC 140, PSYC 141, PSYC 148, PSYC 150, PSYC 152, PSYC 153, PSYC 158, PSYC 161/HMDV 161, PSYC 167/ETST 167, PSYC 168/ETST 168, PSYC 169, PSYC 178
   3) SOC 123, SOC 124, SOC 128/ETST 128, SOC 129, SOC 130, SOC 136, SOC 140, SOC 141, SOC 142, SOC 144, SOC 146, SOC 147, SOC 157, SOC 162, SOC 165/ETST 165, SOC 173, SOC 174/HMDV 174, SOC 175, SOC 177 (E-Z), SOC 180, SOC 183H
   d) Eight (8) units from PSYC 198G or SOC 198G or SOC 198-I taken only after completion of requirements a) and b) above

For the Bachelor of Science

1. Lower-division requirements (16 units)
   a) ANTH 001
   b) PSYC 001, PSYC 002
c) SOC 001

2. Upper-division requirements (60 units)
   a) Twelve (12) units in research methods, chosen from the following courses:
      ANTH 175A, ANTH 175B, ANTH 175C;
      PSYC 012; SOC 110A
   b) Four (4) units in statistics: PSYC 011 or SOC 110B
c) Thirty-six (36) elective units chosen from the following, including at least two courses in each of the areas of Anthropology, Psychology, and Sociology:
   1) ANTH 104, ANTH 106, ANTH 107,
      ANTH 120, ANTH 124, ANTH 125,
      ANTH 127, ANTH 131, ANTH 132,
      ANTH 133, ANTH 162, ANTH 165
   2) ETST 164, PSYC 140, PSYC 141,
      PSYC 148, PSYC 150, PSYC 152,
      PSYC 153, PSYC 158, PSYC 161/HMDV 161, PSYC 167/ETST 167,
      PSYC 168/ETST 168, PSYC 169, PSYC 178
   3) SOC 123, SOC 124, SOC 128/ETST 128, SOC 129, SOC 130,
      SOC 136, SOC 140, SOC 141,
      SOC 142, SOC 144, SOC 146,
      SOC 147, SOC 157, SOC 162,
      SOC 165/ETST 165, SOC 173,
      SOC 174/HMDV 174, SOC 175,
      SOC 177 (E-Z), SOC 180,
      SOC 183H
   d) Eight (8) units from PSYC 198G or SOC 198G or SOC 198-I taken only after completion of requirements a) and b) above

Sociology

Subject abbreviation: SOC

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Professors

Adalberto Aguirre, Jr., Ph.D.
Edna M. Bonacich, Ph.D.
(Sociology/Ethnic Studies)
Steven G. Brint, Ph.D.
Christopher Chase-Dunn, Ph.D.
Scott L. Coltrane, Ph.D.
Robert A. Hanneman, Ph.D.
Augustine Kposowa, Ph.D.
Alfredo M. Mirandé, Ph.D.
(Sociology/Ethnic Studies)
Robert Nash Parker, Ph.D.
Raymond L. Russell, III, Ph.D.
Linda Brewster Stearns, Ph.D.
Annie T. Turk, Ph.D.
Jonathan H. Turner, Ph.D.
Kirk R. Williams, Ph.D.

Professors Emeriti

Edgar W. Butler, Ph.D.
Jane R. Mercer, Ph.D.

Associate Professors

Masako Ishii-Kuntz, Ph.D.
Alexandra Maryanski, Ph.D.

Assistant Professors

Manali Desai, Ph.D.
Karen D. Pyke, Ph.D.
Ellen Reese, 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.

Career Opportunities

A sociology major provides opportunities for a variety of career choices that require only the B.S. or the B.A. degree. It is highly recommended for careers in administration, urban planning, public relations, journalism, marketing research, communication, social welfare, police and law enforcement, government, management, business, and any career that requires an understanding of human behavior and organization within the social environment of modern corporate America. A sociology major also provides an excellent foundation for such professions as teaching, counseling, law and medicine and for advanced degrees in sociology and related disciplines.

Students majoring in sociology can choose between a B.A. or B.S. degree. The department also offers majors in Sociology/Administrative Studies, Sociology/Law and Society; as well as a minor in sociology. All students are required to meet quarterly prior to course enrollment with the student affairs officer or the undergraduate advisor to develop a program of studies.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

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 (52 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 (8 units)  
   a) SOC 001, with a grade of “C” or better  
   b) One additional lower-division Sociology course, with a grade of “C” or better  

2. Upper-division requirements (44 units)  
   a) SOC 110A, SOC 110B  
   b) SOC 168 or SOC 169  
   c) A minimum of one course each selected from four of the following six areas of emphasis:  
      (1) Social Organizations:  
          SOC 150, SOC 151, SOC 171,  
          SOC 176/BSAD 176  
      (2) Social Psychology:  
          SOC 175,  
          SOC 174/HMDV 174, SOC 175,  
          SOC 177E  
      (3) Social Inequality:  
          SOC 129,  
          SOC 130, SOC 133, SOC 135,  
          SOC 140  
      (4) Urban Sociology:  
          SOC 137,  
          SOC 143/URST 143,  
          SOC 182/HMDV 182/URST 182  
      (5) Criminology and Deviance:  
          SOC 124, SOC 144, SOC 146,  
          SOC 147, SOC 149, SOC 159,  
          SOC 180  
      (6) Social Institutions and Change:  
          SOC 122, SOC 123, SOC 139/  
          FVC 139, SOC 142, SOC 158,  
          SOC 160/HMDV 160, SOC 183G  
   c) An additional 16 elective units in Sociology (No more than 4 units may be in any combination of SOC 190, SOC 197, SOC 198G, 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 (52 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 (8 units)  
   a) SOC 001, with a grade of “C” or better  
   b) One additional lower-division Sociology course, with a grade of “C” or better  

2. Upper-division requirements (44 units)  
   a) SOC 110A, SOC 110B and either  
      SOC 168 or SOC 169  
   b) A minimum of one course each selected from four of the following six areas of emphasis:  
      (1) Social Organizations:  
          SOC 150,  
          SOC 151, SOC 171, SOC 176/  
          BSAD 176  
      (2) Social Psychology:  
          SOC 175,  
          SOC 174/HMDV 174, SOC 175,  
          SOC 177E  
      (3) Social Inequality:  
          SOC 129,  
          SOC 130, SOC 133, SOC 135,  
          SOC 140  
      (4) Urban Sociology:  
          SOC 137,  
          SOC 143/URST 143,  
          SOC 182/HMDV 182/URST 182  
      (5) Criminology and Deviance:  
          SOC 124, SOC 144, SOC 146,  
          SOC 147, SOC 149, SOC 159,  
          SOC 180  
      (6) Social Institutions and Change:  
          SOC 122, SOC 123, SOC 139/  
          FVC 139, SOC 142, SOC 158,  
          SOC 160/HMDV 160, SOC 183G  
   c) An additional 16 elective units in Sociology (No more than 4 units may be in any combination of SOC 190, SOC 197, SOC 198G, SOC 198-I.)  

Administrative Studies Requirements (37 units)  

1. Lower-division courses (17 units)  
   a) BSAD 010, BSAD 020A  
   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 102A or ECON 130 or  
          ECON 162/BSAD 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 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):  
       BSAD 105/  
       ANTH 105, BSAD 176/SOC 176,  
       SOC 150, SOC 151  
   (2) Human Resources Management/  
       Labor Relations:  
       BSAD 152/  
       ECON 152, BSAD 153/ECON 153,  
       BSAD 155, BSAD 157, PSYC 142  
   (3) Business and Society:  
       BSAD 161,  
       PHIL 116, POSC 182, POSC 186  
   (4) Marketing:  
       BSAD 110, and two from  
       BSAD 112, BSAD 113,  
       BSAD 114, BSAD 117  
   (5) Managerial Accounting/Taxation:  
       BSAD 163, and two from  
       BSAD 166, BSAD 168A, BSAD 168B  
   (6) Financial Accounting:  
       BSAD 165,  
       BSAD 165A, BSAD 165B  
   (7) Finance:  
       BSAD 134/ECON 134 and  
       two from BSAD 135A, BSAD 136,  
       BSAD 137, BSAD 138, BSAD 139  
   (8) Management Information Systems:  
       BSAD 170, BSAD 171, BSAD 173  
   (9) Production Management:  
       BSAD 121/  
       STAT 121, and two from BSAD 122,  
       BSAD 126, BSAD 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 (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 (8 units)
   a) SOC 001, with a grade of “C” or better
   b) One additional lower-division Sociology course, with a grade of “C” or better

2. Upper-division requirements (56 units)
   a) SOC 001, with a grade of “C” or better
   b) One additional lower-division Sociology course, with a grade of “C” or better

For the Bachelor of Arts

Sociology Department requirements (52 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 (8 units)
   a) SOC 001, with a grade of “C” or better
   b) One additional lower-division Sociology course, with a grade of “C” or better

2. Upper-division requirements (44 units)
   a) SOC 110A, SOC 110B
   b) SOC 168 or SOC 169
   c) A minimum of one course each selected from four of the following six areas of emphasis:
      1. Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/BSAD 176
      2. Social Psychology: SOC 137, SOC 143/URST 143, SOC 182/BSAD 182/URST 182
      3. Social Inequality: SOC 129, SOC 130, SOC 133, SOC 135, SOC 140
      4. Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/BSAD 182/URST 182
      5. Criminology and Deviance: SOC 124, SOC 125, SOC 140, SOC 141, SOC 142, SOC 143
      6. Social Institutions and Change: SOC 122, SOC 123, SOC 124, SOC 125, SOC 126

   d) An additional 16 elective units in Sociology (No more than 4 units may be in any combination of SOC 190, SOC 197, SOC 198G, SOC 198-I.)

Law and Society requirements (36 units)

1. PHIL 007 or PHIL 007H
2. IWSO 100
3. One course chosen from ECON 111 or PSYC 012 or SOC 110A or POSC 114 (or equivalent course in research methods)
4. Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159 (One of these courses may be replaced by a substitute choice from a list of courses published annually by the Law and Society Faculty Committee. Not more than two of the courses taken to meet this requirement [2.d] may be from the same department.)

5. IWSO 193, Senior Seminar

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 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 (52 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 (8 units)
   a) SOC 001, with a grade of “C” or better
   b) One additional lower-division Sociology course, with a grade of “C” or better

2. Upper-division requirements (44 units)
   a) SOC 110A, SOC 110B
   b) SOC 168 or SOC 169
   c) A minimum of one course each selected from four of the following six areas of emphasis:
      1. Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/BSAD 176
      2. Social Psychology: SOC 137, SOC 143/URST 143, SOC 182/BSAD 182/URST 182
      3. Social Inequality: SOC 129, SOC 130, SOC 133, SOC 135, SOC 140
      4. Urban Sociology: SOC 137, SOC 143/URST 143, SOC 182/BSAD 182/URST 182
      5. Criminology and Deviance: SOC 124, SOC 125, SOC 140, SOC 141, SOC 142, SOC 143
      6. Social Institutions and Change: SOC 122, SOC 123, SOC 124, SOC 125, SOC 126

   d) An additional 16 elective units in Sociology (No more than 4 units may be in any combination of SOC 190, SOC 197, SOC 198G, SOC 198-I.)

For the Bachelor of Science

Sociology Department requirements (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 (8 units)
   a) SOC 001, with a grade of “C” or better
   b) One additional lower-division Sociology course, with a grade of “C” or better

2. Upper-division requirements (56 units)
   a) SOC 109, SOC 110A, SOC 110B, SOC 110C, SOC 168, SOC 169
   b) A minimum of one course each selected from four of the following six areas of emphasis:
(1) Social Organizations: SOC 150, SOC 151, SOC 171, SOC 176/B/ BSD 176
(2) Social Psychology: SOC 173, SOC 174/B/ HMDV 174, SOC 175, SOC 177E
(3) Social Inequality: SOC 129, SOC 150, SOC 133, SOC 135, SOC 140
(4) Urban Sociology: SOC 157, SOC 143/URST 143, SOC 182/HMDV 182/URST 182
(5) Criminology and Deviance: SOC 124, SOC 144, SOC 146, SOC 147, SOC 149, SOC 159, SOC 180
(6) Social Institutions and Change: SOC 122, SOC 123, SOC 139/FVC 139, SOC 142, SOC 158, SOC 160/HMDV 160, SOC 183G
d) An additional 16 elective units in Sociology (No more than 4 units may be in any combination of SOC 190, SOC 197, SOC 198G, SOC 198-L)

Law and Society requirements (36 units)
1. PHIL 007 or PHIL 007H
2. IWSO 100
3. One course chosen from ECON 111 or PSYC 012 or SOC 110A or POSC 114 (or equivalent course in research methods)
4. Five courses chosen from ANTH 127, ECON 119, HISE 153, PHIL 165, POSC 167, PSYC 175, SOC 159 (One of these courses may be replaced by a substitute choice from a list of courses published annually by the Law and Society Faculty Committee. Not more than two of the courses taken to meet this requirement [2d] may be from the same department.)
5. IWSO 193, Senior Seminar
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
2. Twenty-four (24) upper-division units from
   a) SOC 110A, SOC 110B, and either 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 198G, 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 Undergraduate Studies 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 Sociology Department encourages eligible students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating countries is found under Education Abroad Program in the Curricula and Courses section.

GRADUATE PROGRAM

The graduate program in Sociology is designed to prepare scholars for teaching and research in the discipline of sociology. As such, it is organized primarily for students seeking the Ph.D. degree, although the M.A. degree may be awarded in the course of a student’s progress.

Admission to graduate status in the Department of Sociology is based upon four criteria:
1. Prior academic performance, especially in Sociology
2. Performance on the GRE
3. Letters of reference from persons familiar with the applicant’s potential for achieving academic excellence
4. The extent to which the student’s areas of expressed interest coincide with departmental emphases

In addition, students are encouraged to submit a copy of one professional or term paper with their application; written work, if submitted, is considered in admission decisions. Normally, students are admitted for the fall quarter of each academic year. Although students may petition to be admitted to the program during the academic year, mid-year admissions are not recommended because the sequence of core courses is designed to begin with the fall quarter. The deadline for applications for admission for the fall quarter is March 1, and for various university fellowship programs, January 5. Students who lack adequate undergraduate preparation in sociology are required to make up such deficiencies before work can be credited toward the graduate program. A detailed statement of degree requirements and procedures for the graduate degrees is available at the departmental office. General university requirements of the Graduate Division can be found in the Graduate Studies section of this catalog.

The graduate program is constructed so that all students normally proceed through three distinct stages in their movement toward the Ph.D. degree: the basic core program, the period of specialization, and writing the dissertation.

Basic Core Program
All students complete the basic program, regardless of whether they hold the B.A. or M.A. degree at the time of admission. A student is expected to complete the basic program in not less than three nor more than six academic quarters. The chair of the graduate affairs committee counsels the student concerning matters relevant to 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) Required Core Sequence in Theory: SOC 202A, SOC 202B
   b) Required Core Sequence in Methodology: SOC 201A, SOC 201B
   c) Required Core Sequence in Statistics: SOC 203A, SOC 203B
   d) Required Proseminar in Sociology: SOC 232
   e) Required Research Colloquium: SOC 293 (required each quarter until student is advanced to candidacy)
f) Required Research Practicum: SOC 250
g) A minimum of one course from each of two specialization areas

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.
**Professional Paper**

Each student completes a paper for faculty review which is in a form, content, and style which would be appropriate for publication or presentation to a sociological audience. The paper should be completed by the fall quarter of the student’s third year in the program. In the subsequent quarter, a faculty committee evaluates, requests changes, and conducts an oral examination. The paper and the examination are part of the assessment for admission to the period of specialization.

When students have successfully completed their requirements under the core program, they request admission to the period of specialization by filing a Petition for Faculty Evaluation with the department. Following faculty evaluation of all aspects of the students’ performance, the Sociology faculty decides whether the students have successfully completed the preliminary qualifying portions of their program and are to be awarded an M.A. degree and admitted to the period of specialization; awarded an M.A. degree but not be admitted to the period of specialization; not awarded an M.A. degree and not admitted to the period of specialization.

**Period of Specialization**

After admission to the period of specialization, the students consult with members of standing specialization committees to work out a program of graduate seminars, directed reading courses, and research experiences appropriate to the students’ two areas of specialization. The following are the primary areas of specialization offered by the department:

1. Criminology and Sociolegal Studies
2. Family and Social Psychology
3. Gender Studies
4. Organizations and Institutions
5. Political Economy and Global Social Change
6. Race and Class Inequality
7. Sociological Theory

A student’s program must include at least one academic quarter of supervised research experience through enrollment in SOC 297 and/or through working as a research assistant. The equivalent of at least one academic quarter of experience in classroom teaching at the college level is also required.

**Examination Sequence**

1. Students must successfully complete three courses with a minimum grade of “B” in each of their two specialization areas.
2. Written qualifying examinations are taken in two areas of specialization. These examinations are administered by standing committees. Both examinations should be completed before the end of the fourth year of graduate study.
3. The student must choose a dissertation committee approved by the graduate advisor. The student completes a dissertation proposal and successfully defends the prospectus in an oral examination. During the student’s fifth year in the program the oral examination is conducted by a committee of at least five faculty members, one of whom is from another department and three of whom are members of the student’s dissertation committee.

Before advancement to candidacy is approved, students must successfully complete a minimum of eight courses: three in each of their two specialization areas and one each in two other specialization areas with a minimum grade of “B” in all 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 should be completed within the normative time of six years from entrance into the program. After the dissertation is prepared according to the rules and format of the Graduate Division and signed and approved by the committee, the student defends the dissertation orally. The defense may be waived in exceptional circumstances.

**LOWER-DIVISION COURSES**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 001</td>
<td>Introduction to Sociology</td>
<td>Lecture, three hours; discussion, one hour. Basic concepts and theories relating to the study of man as a participant in group life; analysis of culture, social institutions, personality development, and processes of social interaction.</td>
</tr>
<tr>
<td>SOC 003</td>
<td>Inequality in American Society</td>
<td>Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. A comparative analysis of the historical and evolutionary development of basic human institutions, including economy, kinship, religion, politics, education, medicine, and science. Emphasis on the historical emergence and differentiation of institutions, and on the dynamic interconnections among institutions in contemporary society.</td>
</tr>
<tr>
<td>SOC 101</td>
<td>The City: An Introduction</td>
<td>Lecture, three hours; extra reading, three hours. Prerequisite(s): SOC 001. 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.</td>
</tr>
<tr>
<td>SOC 015</td>
<td>Social Problems</td>
<td>Lecture, three hours; discussion, one hour. The application of major sociological theories, concepts, and perspectives in an analytical approach to the study of social problems in contemporary society.</td>
</tr>
<tr>
<td>SOC 020</td>
<td>American Society</td>
<td>Lecture, three hours; discussion, one hour. An examination of the culture and structure of American society. Cultural values and beliefs, as well as key institutions, community patterns, and systems of inequality and domination.</td>
</tr>
<tr>
<td>SOC 025</td>
<td>Primate Societies</td>
<td>Lecture, three hours; outside research, three hours. Prerequisite(s): None. A survey of primate societies from a sociological perspective. Topics include primate origins, distribution, social and sexual relationships, and support networks. In particular, focuses on the social networks of monkeys and apes and compares the similarities and differences that exist among human and nonhuman primate societies.</td>
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</table>

**UPPER-DIVISION COURSES**

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC 101</td>
<td>Theoretical Principles of Sociology</td>
<td>Lecture, three hours; term paper, three hours. Prerequisite(s): SOC 001, SOC 168 or SOC 169. A review of the basic forces of human interaction and organization with an eye to extracting the abstract theoretical principles that explain the operation of these forces. Includes reading and learning highly abstract materials in order to discover some of sociology’s basic laws or principles.</td>
</tr>
<tr>
<td>SOC 109</td>
<td>Data Processing</td>
<td>Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. Covers principles of social science data processing from instrument design stage through final analysis. Includes considerations for utilization of unit record, tabulation, and computing processes. Involves experience with unit record procedures, quality control, programming languages, and preprogrammed analytic procedures.</td>
</tr>
<tr>
<td>SOC 110A</td>
<td>Methods of Sociological Inquiry</td>
<td>Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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.</td>
</tr>
<tr>
<td>SOC 110B</td>
<td>Statistical Analysis</td>
<td>Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001, SOC 110A. Logical and procedural aspects of the application of statistical methods for data-reduction and hypothesis-testing in sociology; distributions, tabulations, central tendency, variability, independence, contrasts, correlation and regression, nonparameters. Required of all majors.</td>
</tr>
<tr>
<td>SOC 110C</td>
<td>Multivariate Analysis</td>
<td>Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 110B. Involves computer analysis of social and behavioral data using statistical inference, multiple-regression, simulation, and multivariate nonparametric techniques.</td>
</tr>
<tr>
<td>SOC 120</td>
<td>Human Social Institutions</td>
<td>Lecture, three hours; extra reading, three hours. Prerequisite(s): SOC 001. A comparative analysis of the historical and evolutionary development of basic human institutions, including economy, kinship, religion, politics, law, education, medicine, and science. Emphasis on the historical emergence and differentiation of institutions, and on the dynamic interconnections among institutions in contemporary society.</td>
</tr>
<tr>
<td>SOC 121</td>
<td>Sociology of the 1960s</td>
<td>Lecture, three hours; outside research, three hours. Prerequisite(s): SOC 001 or consent of instructor. A sociological approach to the economic, political, and cultural events of the 1960s. Analysis of the impact of such phenomena as civil rights, popular culture, theology, and political participation. Discussion of the present-day legacy including personal histories of former activists.</td>
</tr>
<tr>
<td>SOC 122</td>
<td>Social Change</td>
<td>Lecture, three hours; outside research, three hours. Prerequisite(s): SOC 001. A study of patterns of social change, resistance to change, and change-producing processes and agencies.</td>
</tr>
<tr>
<td>SOC 123</td>
<td>Human Societies</td>
<td>Lecture, three hours; extra reading, three hours. Prerequisite(s): ANTH 001 or ANTH 011H or SOC 001. An analysis of the nature of delinquency and juvenile justice in American society. Emphasis on models for administering justice including pre-court stages, intake procedures, custody treatment, detention and release, and the development of juvenile correctional institutions.</td>
</tr>
</tbody>
</table>

**SUGGESTED COURSES**

- **SOC 025. Primate Societies.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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. Primarily designed for students interested in human and nonhuman primate societies. **SOC 110A. Methods of Sociological Inquiry.** (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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. Primarily designed for students interested in human and nonhuman primate societies.
adjudication, disposition, and post-adjudicatory supervision, including institutionalization.

SOC 125. Evolutionary Sociology. (4) Lecture, three hours; written work, three hours. Prerequisite(s): SOC 001. Examines the objectives and scope of a cross section of social evolutionary reasoning to examine such topics as social evolution, human evolution, our primate heritage, neurobiology, and human nature.

SOC 128. Chicano Sociology. (4) Lecture, three hours; individual study, three 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; relations 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, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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, three hours; discussion, one hour. Prerequisite(s): SOC 001. A study of underrepresented groups past and present. A search for general principles about their social relations.

SOC 131 (E-Z). Selected Ethnic Groups. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): SOC 001. In-depth studies of particular ethnic groups in the United States. A specific ethnic group is treated for an entire quarter: F Black Americans, H Jewish Americans.

SOC 132. Field Research on Internalized Racism. (4) Lecture, three hours; field work, three hours. Prerequisite(s): SOC 001; SOC 128/ETST 128 or SOC 129 or SOC 130 or a segment of SOC 131 (E-Z) or SOC 133 or SOC 135. 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, three hours, outside research, three hours. Prerequisite(s): SOC 001. Covers the analysis of theory and research concerning sources of inequality in the distribution of scarce rewards in societies; the influence of aspects of race and ethnicity on social relations involving the hierarchical allocation of social groups to positions.

SOC 134. Law, Race, Class, Gender, and Culture. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): SOC 001. 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 schools of jurisprudence, 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, three hours; term paper, three hours. Prerequisite(s): SOC 001. 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, three hours; extra reading, three hours. Prerequisite(s): SOC 001. Examination of 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. Consider 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, three hours; extra reading, three hours. Prerequisite(s): SOC 001. Introduction to the study of human populations, including demographic theory, economic status, variations in social status from region to region, political emergence and variations in values, social relations and integration with non-Mexicans.

SOC 139. Mass Media and Popular Culture. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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. Study of the relationship between the social processes of modern society and the content of popular culture. Cross-listed with FC 139.

SOC 140. The Sociology of Women. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. This course will analyze the role women have played in society, with an emphasis on modern American society. It will consider 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, three hours; discussion, one hour. Prerequisite(s): SOC 001. A comparative analysis and history 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. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. A comparative and historical treatment of the family. Major theoretical frameworks developed for conceptualizing the family as a social system are explored within the context of the relationship between social structure and family group processes.

SOC 143. Urban Sociology. (4) Lecture, three hours; outside reading and research, one hour. Prerequisite(s): SOC 001 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, three hours; discussion, one hour. Prerequisite(s): SOC 001. Addresses causes, identification of various 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, three hours; field, six 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. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

SOC 146. Criminology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. Analysis of nature and patterning of criminality, with attention to theoretical and methodological issues encountered in research. Explanations and crime control policies are critically examined regarding linkages among (1) social conflicts and inequalities, (2) criminal laws and enforcement practices, and (3) social deviance.

SOC 147. Corrections. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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 for the development of criminological theory, the operation of formal organizations, and American ethnic relations.

SOC 150. The Sociology of Economic Organizations. (4) Lecture, three hours; discussion, one 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 156. Community. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): SOC 001. Historical and comparative treatment of the community as a social system; political and economic forces shaping the sense of community; influences of urbanization, industrialization, and bureaucratization on local social systems.

SOC 157. Social Networks. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): SOC 001. 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, three hours, term paper, three hours. Prerequisite(s): SOC 001. 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. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): SOC 001. 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. (4) Lecture, three hours, extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Comparative and critical analysis of educational institutions in complex societies and their relationship to the society's political and economic structure with an examination of the school as a societal subsystem consisting of teacher, student, and administrator roles and its own evolving crime. Cross-listed with HMDV 160.

SOC 161. Immigration and Society. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): SOC 001. 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, three hours; outside research, three hours. Prerequisite(s): SOC 001. Examines the linguistic diversity that has characterized the socio-historical development of United States society.

SOC 163. Social Forces and the Educational Condition of Chicanos. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the social forces that have shaped the Chicanos’ educational condition and evaluates models in the sociology of education that explain their educational situation. Cross-listed with ETST 163.

SOC 165. Sociolinguistics and the Chicano Community. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the regional and social variation in language use within the Chicano community. Specific issues addressed are 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. General sociolinguistic theory and methodology are also addressed. Cross-listed with ETST 165.

SOC 168. Development of Sociological Theory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. The emergence of sociology as a systematic discipline; critical analysis of sociological theory from 1850 to 1920 including the theories of Comte, Tocqueville, Spencer, Marx, Simmel, Weber, Durkheim, and others.

SOC 169. Modern Sociological Theory. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. Analysis and critical evaluation of sociological theory from 1920 to the present; growth of current sociological theories and recent trends in conceptual formulations.

SOC 171. Alternatives to Bureaucratic Organizations. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): SOC 001 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 other, non-bureaucratic, social roles, or owned firms. Recommended for Business Administration majors.

SOC 173. Social Psychology: Sociological Orientation. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. 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, three hours; discussion, one hour. Prerequisite(s): SOC 001 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 will be historical and cross-cultural, with particular attention to the relationship among family structure, social structure, and socialization processes. Cross-listed with HMDV 174.

SOC 175. Social Roles and Interaction. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): SOC 001. The nature of face-to-face contact between people in everyday life. The relation between three theoretical traditions and communication in the day-to-day activities of persons in informal groups, in closed establishments, and in public contacts.

SOC 176. The Sociology of Work in Organizations. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): SOC 001 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 the differences in work among major segments of the labor force. Cross-listed with BISD 176.

SOC 177 (E-Z). Topics in Social Psychology: Sociological Orientation. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SOC 001; HMDV 174; SOC 174 or SOC 175 or SOC 177. Intensive study of selected topics in social psychology, such as the individual and social change; attribution theory; experimentalism in social psychology; exchange and consistency theories in social psychology; applied social psychology; E. Sex Roles; F. Sociology of Human Sexuality; G. Theories of Interpersonal Behavior.

SOC 180. Deviance and Control. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): SOC 001. An introduction to the sociological analysis of deviance as defined by informal and formal processes of social control in varying cultural 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, three hours; outside research, three hours. Prerequisite(s): SOC 001 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, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. An interdisciplinary examination of selected urban problems such as public disorders, transportation, housing, welfare, and planning. Cross-listed with HMDV 182 and URB 182.

SOC 183 (E-Z). Special Topics in Sociology. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): SOC 001. These courses examine special topics in sociology which are not a regular part of the curriculum offerings in the Department. Content of each course is announced as offered. G. Collective Behavior; H. Aging in America; T. Intersocietal Conflict: Political Islam, Terrorism, and the United States; V. Power and Society; W. Social Mobility.

SOC 184. Environmental Sociology. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): SOC 001. 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 noxious facility siting on minority, working class, and poor communities.

SOC 190. Special Studies. (1-5) Individual study, three to fifteen 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): consent of instructor. Directed original research. Course will be graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SOC 198G. Group Internship in Sociology. (1-12) Variable hours. Prerequisite(s): SOC 110A and consent of instructor prior to enrollment in the course to facilitate placement. Group internships provide community agencies to observe community processes. The student spends three hours per week in a combination of academic preparation and internship for each unit of credit. May be repeated to a total of 16 units.

SOC 198-I. Individual Internship in Sociology. (1-12) Variable hours. Prerequisite(s): SOC 110A and consent of instructor prior to enrollment in the course to facilitate placement. Individual internship in community agencies to observe community processes. The student spends three hours per week in a combination of academic preparation and internship for each unit of credit. May be repeated to a total 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, three hours; individual study, three hours. Prerequisite(s): SOC 110A or equivalent, graduate standing; or consent of instructor. 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, three hours; individual study, three hours. Prerequisite(s): SOC 110A 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, interpretative methods; and the uses of documentary and historical resources.

SOC 202A. History of Sociological Theory. (4) Lecture, three hours; outside research, three 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, three hours; outside research, three 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 204A. Social Science and Environmental Policy. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SOC 110A and SOC 110B or equivalents, SOC 204A or SOC 204B, graduate standing; or consent of instructor. Covers principles of public and private association, variance, and statistical estimation through the use of log-linear, multiple regression, and ANOVA models.

SOC 205A. Social Science and Environmental Policy. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): SOC 110A and SOC 110B or equivalents, SOC 205A or SOC 205B, graduate standing; or consent of instructor. Covers principles of multi-equation systems, latent variables, and factors through the use of confirmatory factor and covariance structure models. Covers reliability and validity assessment for scaling techniques.

SOC 232. Proseminar in Sociology. (2) Lecture, two 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).
SOCI 240. Sociology of Gender. (4) Lecture, three hours; outside research, three 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.

SOCI 242. (E-Z). Sociological Theory. (4) Lecture, three hours; outside research, three 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 taken Satisfactory (S) or No Credit (NC) with permission of Graduate Advisor.

SOCI 243 (E-Z). Special Topics in Sociology. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate status and 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. Announcement of each topic will define the course. Students who take the core to meet specialization requirements receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade.

SOCI 244. Institutional Analysis. (4) Lecture, three hours; outside research, three 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 restructuring processes. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 245. Large-Scale Organizations. (4) Lecture, three hours; outside research, three 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.

SOCI 246. Race and Class Inequality. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. A review to the varieties of racial and class inequality. Areas covered will include 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.

SOCI 247. Core Course on Urban Sociology. (4) Lecture, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. A review of the literature on urban sociology. 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.

SOCI 248. Core Course on Social Psychology. (4) Lecture, three hours; outside research, three 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.

SOCI 249. Contemporary Research and Theory in Criminology and Sociological Studies. (4) Lecture, three hours; outside research, three 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.

SOCI 250. Research Practicum. (4) Seminar, three hours. Prerequisite(s): completion of methods sequence. A seminar of supervised research in which students are expected to integrate their knowledge within the context of work on a topic of individual choice. Graded Satisfactory (S) or No Credit (NC).

SOCI 255 (E-Z). Topics in Large-Scale Organizations. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 245 or consent of instructor. Advanced study of large-scale organizations: 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 advisor.

SOCI 257 (E-Z). Topics in Institutional Analysis. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 244 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 advisor.

SOCI 260. Economic, Politics and Society. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate status and consent of instructor. This course will analyze the sociological implications of environmental problems. It will explore the alternative theories used to study human environment interactions, the environmental movement and social change, costs and benefits of environmental regulations, political economy of environment-development disputes and land use conflicts, and distributive impact of environmental reform.

SOCI 261. World-Systems Analysis. (4) Seminar, four 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.

SOCI 262. Theory and Method in Gender Studies. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing, SOC 240, or consent of instructor. Provides students with an overview of recent debates about theory and method in gender studies. Relationships between feminist theory, feminist practice, and social science are explored. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 263. Women and Work in World Historical Perspective. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 240 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 advisor.

SOCI 264 (E-Z). Topics in Gender Studies. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 240 or consent of instructor. Advanced study in the sociology of gender: E. Domestic and Sexual Violence; F. The Sociology of Men. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 265 (E-Z). Topics in Race and Class Inequality. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 240 or consent of instructor. Advanced study in race and class inequality: E. Inequality, F. Race and Ethnicity, G. The Sociology of Men. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 266. Race and Ethnic Relations. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 246 or consent of instructor. A review of sociologies of 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 advisor.

SOCI 267. Social Stratification. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 246 or consent of instructor. A review of sociological literature on racial and class stratification, power, and equity. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 268. Law, Race, Class, and Gender. (4) Seminar, three hours; outside research, three 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.

SOCI 270. Intermediate Qualitative Analysis. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): SOC 201A, SOC 201B, SOC 203A, SOC 203B, graduate standing; or consent of instructor. Provides and overview of the uses and limitations of methods for the analysis of qualitative data in sociology. Included are participant and systematic observation, intensive and informant interviewing, and the use of documents and historical sources. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 271. Intermediate Quantitative Analysis. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): SOC 201A, SOC 201B, SOC 203A, SOC 203B, graduate standing; or consent of instructor. Provides and overview of the uses and limitations of methods for the analysis of quantitative data in sociology. Included are logit and log-linear (and related) models, general linear model applications, and related techniques. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 272 (E-Z). Advanced Topics in Research Methods. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): SOC 201A, SOC 201B, SOC 203A, SOC 203B, graduate standing; or consent of instructor. Analysis of specific problems and methods of sociological research at an advanced level. E. Historical and Comparative Methods; F. Field Methodology; G. Survey Research Methodology; I. Experimental and Quasi-Experimental Design and Analysis; J. Measurement and Scaling Techniques; K. Introduction to Mathematical Sociology; M. Analysis of Nominal and Ordinal Data; N. Analysis of Continuous Data. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOCI 275 (E-Z). Topics in Urban Sociology. (4) Seminar, three hours. Prerequisite(s): SOC 247. Advanced study in urban sociology. E. Urban Ecology; F. Suburbanization; G. Urban Problems; H. Urban Political Sociology. May be graded Satisfactory (S) or No Credit (NC) with permission of Graduate Advisor.

SOCI 278. Punishment and Correction: Evaluating Theories and Policies. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 249 or consent of instructor. This course 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. Prisons, probation, and other crime control measures are examined from a perspective emphasizing the need for systematic evaluation research. May be taken Satisfactory (S) or No Credit (NC) with permission of instructor and advisor.

SOCI 279. Analysis of the Criminal Justice Process. (4) Seminar, three hours; outside research, three hours.
three 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 permission of instructor and advisor.

SOC 280 (E-Z). Topics in Criminology and Sociological Studies. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): either graduate standing and SOC 249 or consent of instructor. Advanced seminars in criminology and sociological studies: E. Patterns of Criminal and Deviant Behavior; F. Ecological Perspectives on 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. May be taken Satisfactory (S) or No Credit (NC) with permission of instructor and advisor.

SOC 285 (E-Z). Topics in Social Psychology. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): SOC 248 or consent of instructor. Advanced study in social psychology: E. Theory in Social Psychology; F. Methods of Research in Social Psychology; G. The Interaction Process; H. Social Psychology of Social Movements; I. Sociolinguistics; K. Small Groups; M. Social Psychology of the Family; N. The Social Psychology of Gender. May be taken Satisfactory (S) or No Credit (NC) with consent of instructor and advisor.

SOC 290. Directed Studies. (1-6) Scheduled research, three to fifteen hours; consultation, one 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 special areas and/or preparing original research work. With consent of the graduate advisor, this course may be taken for a letter grade or 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, three to thirty-six hours. 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 special areas and/or preparing original research work. With consent of the graduate advisor, this course may be taken for a letter grade or 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 293. Research Topics in Sociology. (2) Lecture, two hours. Prerequisite(s): graduate standing in Sociology. A seminar or lecture-discussion which uses materials selected and organized by staff to meet specific needs of graduate students. May be repeated for credit.

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.

SOC 301. Directed Studies in the Teaching of Sociology. (2) Consultation, one hour; practicum, three 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, one hour; teaching practicum, three to nine 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, three hours; individual study, three 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

Walter J. Farmer, Ph.D., Chair
Michael A. Anderson, Ph.D., Graduate Advisor
Program Office, 2207 Geology (909) 787-5103; soilwater.ucr.edu

Professors

Christopher Amrhein, Ph.D. (Environmental Sciences) Soil Chemistry
Andrew C.S. Chang, Ph.D. (Environmental Sciences) Agricultural Engineering
David E. Crowley, Ph.D. (Environmental Sciences) Soil Microbiology
Walter J. Farmer, Ph.D. (Environmental Sciences) Soil Chemistry
William T. Frankenberger, Jr., Ph.D. (Environmental Sciences) Soil Microbiology
Robert C. Graham, Ph.D. (Environmental Sciences) Soil Mineralogy and Pedology
William A. Jury, Ph.D. (Environmental Sciences) Soil Physics
John Letey, Jr., Ph.D. (Environmental Sciences) Soil Physics
Lanny J. Lund, Ph.D. (Environmental Sciences) Soil Morphology, Genesis, and Classification
David R. Parker, Ph.D. (Environmental Sciences) Soil Biogeochemistry
Daniel Schlenk, Ph.D. (Environmental Sciences) Aquatic Ecology
Marylyn V. Yates, Ph.D. (Environmental Sciences) Environmental Microbiology

Professors Emeriti

Glen H. Cannell, Ph.D. (Environmental Sciences) Soil Physics
Homer D. Chapman, Ph.D., LL.D. (Environmental Sciences) Soils and Plant Nutrition
Albert L. Page, Ph.D. (Environmental Sciences) Soil Chemistry
Parker I. Pratt, Ph.D. (Environmental Sciences) Soil Chemistry

Associate Professors

Michael A. Anderson, Ph.D. (Environmental Sciences) Environmental Chemistry
David M. Crohn, Ph.D. (Environmental Sciences) Biosystems Engineering
Laosheng Wu, Ph.D. (Environmental Sciences) Soil Physics
Paul J. Ziemann, Ph.D. (Environmental Sciences) Atmospheric Chemistry

Assistant Professors

Jiangying “Jay” Gan, Ph.D. Environmental Chemistry (Environmental Sciences)
Brian Lanoli, Ph.D. (Environmental Sciences) Environmental Microbiology
Thomas Meixner, Ph.D. (Environmental Sciences) Hydrology
Lisa Stein, Ph.D. (Environmental Sciences) Environmental Microbiology

Acting Assistant Professor

W. Bowman Cutter, M.S. (Environmental Sciences)

Adjunct Professors

Andrej Bynerowicz, Ph.D. Atmospheric/Forest Sciences
James D. Oster, Ph.D. Soil Chemistry
James D. Rhoades, Ph.D. Soil Science
Donald L. Suarez, Ph.D. Geochemistry
Martinus T. van Genuchten, Ph.D. Soil Physics
Scott R. Yates, Ph.D. Soil Physics

Adjunct Associate Professor

Sabine Goldberg, Ph.D. Soil Chemistry

Cooperating Faculty

Michael E. Allen, Ph.D. (Biology/Plant Pathology) Mark R. Matsumoto, Ph.D.
(Chemical and Environmental Engineering)
Harry W.K. Tom, Ph.D. (Physics)

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. 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 entering the program are expected to have completed one year of general chemistry, as well as courses in general physics, organic chemistry, calculus through integrals, general biology, statistics, and 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.

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 for review.

All 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 165 (Hydrology)

Biology
BPSC 134/ ENSC 134/ SWSC 134
(Soil Conditions and Plant Growth)
SWSC 111 (Microbiology and Biochemistry of Soils)
ENSC 141 (Aquatic Microbiology)

Natural Structure and Diversity
ENSC 138/ GEO 138/ SWSC 138 (Soil Morphology and Classification)
ENSC 140/ SWSC 140 (Limnology)

In partial fulfillment of requirements for an advanced degree in Soil and Water Sciences, all students must present a departmental seminar summarizing results of their thesis or dissertation or internship. This requirement is formalized by enrolling in SWSC 250 for two units 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
Two options are available for students seeking the M.S. degree in Soil and Water Sciences: Plan I (Thesis), and Plan II (Comprehensive Examination).

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 thesis or dissertation (SWSC 297 or SWSC 299) are applicable.

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 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. Completing all course work with an average GPA of 3.0 or greater
2. Passing both the written and oral qualifying examinations
3. Completing at least 4 units of Teaching Practicum (SWSC 302)
4. Submitting an approved research dissertation

Before advancement to candidacy, students must complete all required course work as approved by their advisory committee, pass a written qualifying examination administered by a five-member committee, and pass 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. 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 100L Introductory Soil Science Laboratory. (2) F Lecture, one hour; laboratory, three hours. Prerequisite(s): CHEM 001A, CHEM 001B, CHEM 001C and concurrent enrollment in ENSC 100; GEO 001 is recommended. Properties of soils and their uses. Evaluation of physical, chemical, and biological properties of soils. Frankenberg

SWSC 104. Environmental Soil Chemistry. (5) F Lecture, three hours; laboratory, six hours. Prerequisite(s): CHEM 005 or ENSC 100 or consent of instructor.

A study of the chemistry of the soil, liquid, and gas phases in soils and soil-like materials. Topics include solid and solution equilibria, mineral solubility, clay mineralogy, ion exchange, surface chemistry, redox reactions, kinetics, and the chemistry of organic contaminants and toxic trace elements in soils. Cross-listed with ENSC 104. Amrhein

SWSC 107. Soil Physics. (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 009A or MATH 099A, MATH 099B, 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 ENSC 107. Wu

SWSC 111. Microbiology and Biochemistry of Soils. (4) W Lecture, three hours; laboratory, three hours. Prerequisite(s): BIOL 005A, BIOL 005B, CHEM 112A, CHEM 112B (CHEM 112B may be taken concurrently). Topics include the nature of soil microflora and soil organic matter; effects of microbial processes upon chemical and physical properties of soils, microbial communities, and plant nutrition; and biodegradation of natural and synthetic compounds added to soil. Crowley

SWSC 124. Soils of Wildland Ecosystems. (4) Lecture, three hours; two one-day and two one-two day field trips. Prerequisite(s): ENSC 100; ENSC 100L or SWSC 100L. The properties and functions of soils in desert, grassland, chaparral, forest, and alpine ecosystems, with emphasis on California; the importance of soils in natural plant communities and animal habitats; and soil properties for wildland resource management.

SWSC 127. Fate and Transport of Contaminants in Soil. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001A or CHEM 01HA; CHEM 001B or CHEM 01HB; CHEM 001C or CHEM 01HC, ENSC 100; MATH 009B or MATH 099B. 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.

SWSC 134. Soil Conditions and Plant Growth. (4) W Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 104/ BPSC 104, ENSC 100; 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-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 BPSC 134. Parker

SWSC 136. Chemistry of Natural Waters. (4) S Lecture, three hours; discussion, one 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. Zieman

SWSC 138. Soil Morphology and Classification. (4) S Lecture, three hours; laboratory, normally three hours; two one-two day field trips. Prerequisite(s): ENSC 100; GEO 001 or GEO 002; or consent of instructor. The study of soils as they occur in the field and their relations to current and past environmental conditions. Use of field and laboratory data to understand soil genesis, causes of soil variability, fundamentals of soil classification, and land use potentials. Laboratory emphasizes the description and interpretation of soils and landscapes in the field. Cross-listed with ENSC 138 and GEO 138. Graham

SWSC 140. Limnology. (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): CHEM 001A or CHEM 01HA, CHEM 001B or CHEM 01HB, CHEM 001C or CHEM 01HC, ENSC 101. Study of surface waters. Cotsold.
ers 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 146.

SWSC 176. Acquisition and Analysis of Environmental Data. (5) Summer Lecture; two hours; discussion, one hour; laboratory; three hours; field, three hours. Prerequisite(s): ENSC 100, ENSC 101, ENSC 102, either the STAT 100A and STAT 100B sequence or STAT 120A and STAT 120B sequence; or consent of instructor. Explores general principles of environmental sampling. Field exercises cover sampling and analysis of air, water, and soil; hydrologic and limnological measurements; and biological characterization of soils and surface waters. Topics also include principles and use of geographic positioning systems (GPS) basic sampling and analytical techniques for site characterization; and interpretation and presentation of field and laboratory data using computer software. Cross-listed with ENSC 170. Parker, Anderson, Hytcinnen.

SWSC 190. Special Studies. (1-3) 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 202. Soil Chemical Conditions and Plant Growth. (4) S Lecture, three hours; discussion, one hour. Prerequisite(s): BPS 154/ENSC 154/SWSC 154, ENSC 104/SWSC 104 or consent of instructor. BIOL 143/BPS 143 recommended. Soil chemical processes that influence the bioavailability of essential mineral nutrients and potentially toxic trace elements, and the plant uptake, metabolism, and partitioning of these elements. Soil solution and rhizosphere chemistry; root surface chemistry; ion transport processes in plants; mechanisms of trace element toxicities and tolerance; plant uptake and partitioning of environmentally hazardous elements. Parker

SWSC 203. Surface Chemistry of Soils. (4) W, Odd Years Lecture, four hours. Prerequisite(s): CHEM 109 or CHEM 110A; ENSC 104/SWSC 104; or consent of instructor. Quantitative description of the properties of soils and their interfaces, including charge properties, the electric double layer, ion exchange, and surface complexation reactions. Anderson

SWSC 204. Environmental Organic Chemistry. (4) W, Even Years Lecture, four hours. Prerequisite(s): CHEM 109 or CHEM 110A; ENSC 104/SWSC 104; or consent of instructor. Fundamentals of the chemistry of and physical properties of the major classes of organic contaminants found in soils. Origin, occurrence, and properties of soil organic compounds; decomposition, and biogeochemical cycling of organics. Graham

SWSC 206. Principles and Theories Relating to Arid Zone Soils. (4) S, Odd Years Lecture, three hours; seminar, one 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 207. Advanced Soil Physics. (4) Lecture, four hours. Prerequisite(s): ENSC 107/SWSC 107. Applications of physics and physical chemistry to soil systems.

SWSC 208. Ecotoxicology. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): BIOL 055A, BIOL 055B, CHEM 100A, CHEM 101A, 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 the potential transport and fate of important organic contaminants and pathogens in soil-water systems; discussion of remediation procedures for contaminant cleanup; analysis of case studies of soil pollution.

SWSC 211. Microbial Ecology. (3) S, Odd Years Lecture, three hours. Prerequisite(s): 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 MBL 211. Crowley

SWSC 213. Soil Mineralogy. (3) W, Even Years Lecture, three hours. Prerequisite(s): CHEM 001A or CHEM 011A, CHEM 001B or CHEM 011B; CHEM 001G; or CHEM 011G. GEOL 001. ENSC 104/SWSC 104 and ENSC 138/GEOL 138/SWSC 138 are recommended. The composition, structure, and classification of minerals commonly found in soils. Origin, occurrence, and properties of soil minerals in relation to mineralogy and geomorphic processes. 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, one hour; laboratory, nine hours. Prerequisite(s): concurrent enrollment in SWSC 213. Introduction to methods of soil mineral analysis, including sample preparation, X-ray diffraction, electron microscopy, thermal analysis, infrared spectroscopy, and surface area analysis. Data interpretation and presentation. Graham

SWSC 216. Biodegradation of Xenobiotic Chemicals. (3) Lecture, three hours. Prerequisite(s): BIOL 100, BIO 121A/MCBL 121A, BIO 121L/MCBL 121L; or equivalents. Explores the importance of microorganisms in metabolizing synthetic organic chemicals. Topics include ecology, physiology, growth, isolation, and identification of degradative bacteria; bioremediation processes; and environmentally related problems. Examines studies of catalytic pathways including metabolites, enzymes, genes, and environmental factors. Cross-listed with ENTR 216 and MBL 216. Focht

SWSC 216L. Laboratory in Biodegradation of Xenobiotic Chemicals. (3) Discussion, one hour; laboratory, three hours. Prerequisite(s): BIOL 100, BIO 121A/MCBL 121A, BIO 121L/MCBL 121L; or equivalents. Covers laboratory methods used for isolation and identification of degradative bacteria and kinetics of growth and metabolism. Examines studies of catalytic pathways, separation, and spectroscopic identification of metabolites. Cross-listed with ENTR 216L and MBL 216L. Focht

SWSC 218. Pedology. (4) F, Even Years Lecture, three hours; two day and two one-day field trips. Prerequisite(s): ENSC 138/GEOL 138/SWSC 138 or consent of instructor. Integrated functioning of natural chemical, physical, and biological processes in soils in relation to the lithologic, geomorphic, biologic, and climatic environmental factors; soil diversity and effects of pedologic processes on scales ranging from microscopic to global. Graham

SWSC 221. Transport and Fate of Inorganic Contaminants in Soil-Water Systems. (4) Lecture, four hours. Prerequisite(s): ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 111; or consent of instructor. BiPS 154/ENSC 154/SWSC 154 is recommended. Integrated presentation of the basic processes involved in the transport and fate of important inorganic contaminants in soil-water systems; discussion of remediation procedures for contaminant cleanup; analysis of case studies of soil pollution.

SWSC 222. Transport and Fate of Organic Contaminants in Soil-Water Systems. (4) Lecture, four hours. Prerequisite(s): ENSC 104/SWSC 104, ENSC 107/SWSC 107, ENSC 111; or consent of instructor. BiPS 154/ENSC 154/SWSC 154 is recommended. Integrated presentation of the basic processes involved in the transport and fate of important inorganic contaminants and pathogens in soil-water systems; discussion of remediation procedures for contaminant cleanup; analysis of case studies of soil pollution.

SWSC 224. Watershed Hydrologic Systems. (5) Lecture, three hours; discussion, two hours. Prerequisite(s): ENSC 163; CHEM 109, CHEM 110B; or consent of instructor. Discusses the hydrologic processes occurring at watershed scale and the systems of and distributed approaches to watershed hydrologic modeling. Focuses on modeling rainfall-runoff processes and considering water quality to determine the validity of hydrologic simulation models. Cross-listed with ENSC 224. Meixner

SWSC 225. Watershed Biogeochemistry. (3) Lecture, three hours. Prerequisite(s): ENSC 163; CHEM 156/ENSC 156/ENTX 156; CHEM 156 or ENSC 104/SWSC 104 or ENSC 232/SWSC 232 is recommended. Emphasizes terrestrial-aquatic linkages in headwater catchments, focusing on hydrologic pathways, isotopic and geochemical tracers, nutrient cycling, water quality, experimental manipulations, and modeling. Cross-listed with ENSC 225.

SWSC 232. Biogeochemistry. (4) S, Odd Years Lecture, three hours; discussion, one 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, three 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 ENTR 245. Ziemann

SWSC 250. Seminar in Soil and Water Sciences. (1-2) F,W,S Seminar, one 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 251. Seminar in Soil Physics. (2) Seminar, two hours. Prerequisite(s): graduate standing. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in soil physics and hydrology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

SWSC 255. Graduate Seminar in Soil Microbiology and Soil Biochemistry. (2) Seminar, two hours. Prerequisite(s): graduate status. Oral reports and discussion by students, faculty, and visiting scholars on current research topics in soil microbiology and soil biochemistry. Emphasis will be placed on the microbial and biochemical role of the soil in relation to maintenance of environmental quality. Graded Satisfactory (S) or No Credit (NC).
SWSC 256. Graduate Seminar in Soil Mineralogy and Soil Genesis. (2) Seminar, two hours. Prerequisite(s): graduate standing. Oral reports and discussion by students, faculty, and visiting scholars on historical developments and current research topics in soil mineralogy and soil genesis. Graded on a Satisfactory (S) or No Credit (NC) basis; however, students may petition the instructor for a letter grade.

SWSC 257. Environmental Chemistry Seminar. (I) Seminar, one hour. Prerequisite(s): graduate standing in Chemistry or Soil and Water Sciences. Oral presentations by visiting scholars and UCR faculty on current research topics in environmental chemistry, environmental science, and environmental toxicology. Graded Satisfactory (S) or No Credit (NC). Course is repeatable. Cross-listed with CHEM 257.

SWSC 260 (E-Z). Special Topics in Soil and Water Sciences. (1-3) Seminar, one to three hours. Prerequisite(s): graduate standing and consent of instructor. Seminars on advanced and current topics in soil and water sciences. Graded Satisfactory (S) or No Credit (NC).

SWSC 262. Wetlands Biogeochemistry Seminar. (2) Seminar; two hours. Prerequisite(s): CHEM 136 or ENSC 136 or ENSC 104 or SWSC 104; ENSC 141 or SWSC 111; or consent of instructor. 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, three to eighteen 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-l. Individual Internship. (1-12) Internships, three to thirty-six hours per week. 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.

STATISTICS

Major

Subject abbreviation: STAT

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Professors
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Associate Professor
Morris J. Garber, Ph.D.
D. V. Goldhale, Ph.D.
David J. Strauss, Ph.D.

Assistant Professor
Christopher A. Robertson, Ph.D.

Acting Assistant Professor
Xinping Cai, M.S.

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 interest. 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 105, STAT 120A, STAT 120B, STAT 121/BSAD 121, 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 computing and the solving of real world statistical problems that arise in many disciplines. The department has multiple computer laboratories, including a new interactive multimedia computer lab with Pentium-class machines, a SUN Microsystems Netra server, and a UNIX-based laboratory that includes multiple SUN Microsystems Ultra 10 workstations. All of these laboratories are networked, with direct access to the Internet. In addition, the computers provide students, faculty, and staff with access to the campus DEC-alpha computer cluster. The CRAY 190 Supercomputer at the SDSC Center is also available to graduate students and faculty.

Statistical Consulting Center

The Statistical Consulting Center provides consultative services, including design of experiments, statistical data reduction, inference, and modeling for the campus community, and promotes cooperative research between statisticians and other investigators in all fields of the application of statistics. The center is staffed by both faculty and graduate students.

Career Opportunities

The Department of Statistics prepares students for careers in business, government, and industry as well as for research and teaching. There is substantial demand in both the private and public sectors of our economy for those with strong training in statistics. People with bachelor's and master's degrees in statistics typically find employment with the research departments of banks, financial and insurance institutions (actuarial activities); aerospace, electronics and other engineering organizations; pharmaceutical companies; urban planning units; marketing companies; and government agencies, who are responsible for establishing and compiling standards for public health, safety, and quality of life. People with either the M.S. or Ph.D. in statistics may find employment in teaching as well as consulting.

Degree 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.

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 units)
   a) CS 010, MATH 009A, MATH 009B, MATH 009C, MATH 010A
   b) Four (4) additional units in Mathematics, chosen from MATH 023, MATH 113, or MATH 151

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) Sixteen (16) units chosen from STAT 127/BSAD 127, STAT 130, STAT 140, STAT 146, STAT 160A, STAT 160B, STAT 160C, STAT 171

Note: An introductory Statistics class such as STAT 040, STAT 048, or STAT 100A is strongly recommended.

For the Bachelor of Science

1. Core requirements (24 units)
   a) CS 010, MATH 009A, MATH 009B, MATH 009C, MATH 010A
   b) Four (4) additional units in Mathematics, chosen from MATH 023, MATH 113, or MATH 151

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) Sixteen (16) units chosen from STAT 127/BSAD 127, STAT 130, STAT 140, STAT 146, STAT 160A, STAT 160B, STAT 160C, STAT 171
   b) Sixteen (16) units of additional course work chosen, with the approval of the major advisor, from Statistics courses numbered 121 and higher or from related fields.

Note: An introductory Statistics class such as STAT 040, 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):
   a) 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 198-1
   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 units)
   a) ECON 003
   b) BSAD 010, BSAD 020A, BSAD 020B

2. Upper-division requirements (16 units)
   a) MATH 113
   b) Three courses from one area
      (1) Marketing: BSAD 110, BSAD 113, BSAD 117
      (2) Finance: BSAD 134/ECON 134, BSAD 155A, 155B, BSAD 156, BSAD 158
      (3) Accounting: BSAD 163, BSAD 165A, BSAD 165B, BSAD 168
      (4) Management Information Systems: BSAD 170, BSAD 171, BSAD 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 and STAT 100B or STAT 120A and STAT 120B
2. Eight (8) units from STAT 127/BSAD 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

No more than 8 of the 24 units may be in courses required in the student’s major.

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 Undergraduate Studies section of this catalog for additional information on minors.

GRADUATE PROGRAMS

The department offers an M.S. degree in Statistics and a Ph.D. degree in Applied Statistics. Domestic applicants for admission to graduate programs must supply GRE verbal and quantitative test scores before they can be admitted.

Master’s Program

Students entering the program must either have completed a bachelor’s degree in Statistics (or the equivalent), or take STAT 160A, STAT 160B, STAT 160C, 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. This is consistent with admission requirements of the Applied Statistics Ph.D. program. No foreign language is required.

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 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 125A, MATH 125B (Introduction to 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 STAT 281, STAT 293A, STAT 293B, STAT 293C, and 1 unit of STAT 288. 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.

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. Some students proceed from the M.S. degree to the Ph.D. program in Applied Statistics. Admission to the Ph.D. program normally requires preparation equivalent to the M.S. degree.

Applied Statistics Doctoral Program

The program for a Ph.D. in Applied Statistics 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 Ph.D. program in Applied Statistics usually have completed a master's degree in Statistics, Computer Science, Mathematics, or some other quantitatively based discipline. In some instances, students with master's degrees in other fields will be admitted to the program, but in such cases, remedial course work in Statistics, Computer Science, or Mathematics will probably be required. Students also have to meet the general requirements listed in the Graduate Studies section of this catalog.

Course Work

Courses to be taken are in Statistics and the substantive field appropriate to the student's interest. Students without the courses prescribed by the M.S. in Statistics or their equivalent are required to take them as soon as possible. Students in the Ph.D. program in Applied Statistics are required to complete course work in statistics greater in depth than that required for the M.S. 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. They are required to select four or more additional quarter courses in Statistics at the 200 level, not to be graded "Satisfactory/No Credit." These additional courses should be selected in consultation with the graduate advisor and/or the student's major professor in order to strengthen a student's background in statistics and to prepare the student for thesis work and a career in research and teaching. To be approved, a program must include STAT 210A, STAT 210B, STAT 210C, and three of the following five courses: STAT 200A, STAT 200B, STAT 215, STAT 216A, STAT 220A. In preparing for the written qualifying examinations, a student is permitted to 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. In addition, students are required to complete a minimum of 12 units (or equivalent) in a substantive field with a minimum GPA of 3.00. The requirement may be waived if the student already has the background in the substantive area.

Foreign Language Requirement

None

Qualifying Examination

Before advancement to candidacy, students must demonstrate proficiency on a qualifying examination which is normally taken after two years of course work and seminars.

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

STAT 020. Statistics for the Life Sciences. (2)

Lecture, two hours. Prerequisite(s): MATH 005.


STAT 040. Elements of Statistics. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): none. An introduction to statistics. Aids the modern Bayesian approach that advocates that estimates, hypothesis tests, and decisions be made from information developed from a formal combination of current and earlier data. Topics include summarizing and displaying data, designing experiments, probability, Bayes' rule, inferences from proportions and normal populations, sampling, and regression analysis. Minitab is used. Credit is awarded for only one of STAT 040, STAT 048, or STAT 100A.

STAT 048. Introduction to Statistical Computing. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): STAT 100A or equivalent. Randomization tests. Stratified sampling. Cluster sampling. Ratio and regression estimates. Random response, capture-recapture and jackknife techniques.

STAT 100A. Introduction to Statistics. (5)

Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 005 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 040, STAT 048, or STAT 100A.

STAT 100B. Introduction to Statistics. (5)

Lecture, three hours; discussion, one hour. Prerequisite(s): STAT 100A. An introduction to inferential statistics. Topics include linear regression, correlation, analysis of variance, nonparametric methods, and some experimental designs.

STAT 101. Statistics for Economics. (4)

Lecture, three hours; discussion, one hour; laboratory, one hour. Prerequisite(s): MATH 005. An introduction to the basic statistical methods for economics. Topics include economic data analysis, index numbers, univariate and bivariate probability distribution, correlation and regression, sampling distributions, properties of estimators, and hypothesis testing. Cross-listed with ECON 101.

STAT 105. Statistics for Biomedical Sciences. (2)

Lecture, two hours. Prerequisite(s): MATH 009A, MATH 009B; upper-division standing. Covers descriptive statistics or consent of instructor. Descriptive statistics; probability and distributions; statistical inference, including estimation and testing of hypotheses; nonparametric methods; analysis of categorical data; regression; and correlation.

STAT 120A. Experimental Techniques for Biologists. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 005; upper-division standing. Covers descriptive statistics, one- and two-sample tests, one-way analysis of variance, multiple comparisons, and simple linear regression and correlation.

STAT 120B. Experimental Techniques for Biologists. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 005; upper-division standing. Covers descriptive statistics, one- and two-sample tests, one-way analysis of variance, multiple comparisons, and simple linear regression and correlation.

STAT 121. Introduction to Management Science. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): MATH 023, CS 008 or their equivalent; upper-division standing. Survey of deterministic and probabilistic models for decision making: linear programming and extensions, networks, dynamic programming, decision trees, queuing models, and simulation. Uses of these models in decision making are discussed. Use of the computer is emphasized. Cross-listed with BSAD 121.

STAT 127. Introduction to Quality Improvements. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): STAT 048 or consent of instructor. Deming's 14 points for management, graphical methods, Ishikawa diagram, Pareto analysis, cause-and-effect diagrams 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, accelerated life testing. Cross-listed with BSAD 127.

STAT 130. Sampling Surveys. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): STAT 100A or equivalent. Simple random sampling. Stratified sampling. Cluster sampling. Ratio and regression estimates. Random response, capture-recapture and jackknife techniques.

STAT 140. Nonparametric Techniques. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): STAT 100A or equivalent. Randomization tests. Rank tests. Methods of association. Distribution free tests.

STAT 146. Statistical Forecasting Techniques. (4)

Lecture, three hours; discussion, one hour. Prerequisite(s): STAT 100A or consent of instructor. Exponential smoothing. Regression analysis (simple and multiple). Time series. Trend analysis, seasonal analysis.

STAT 147. Introduction to Statistical Computing. (4)

Lecture, three hours; discussion, one 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, three hours; discussion, one hour. Prerequisite(s): MATH 009C. Sample spaces
and probability. Random variables and probability distributions. Selected topics in multivariate distributions. Introduction to stochastic processes. Elements of statistical inference; testing and estimation.

STAT 177. Statistical Computer Packages. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 100A, STAT 100B, or equivalents; STAT 147; or consent of instructor. A study of major statistical packages, including SAS and BMDP 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; three hours; discussion, one hour. Prerequisite(s): MATH 190C or MATH 196C (may be taken concurrently). Topics include statistical regularity, probability spaces, fundamental theorems in discrete probability, Bayes' theorem, random variables, densities and distribution functions, continuous distributions, transformations of random variables, and central limit theorem. Credit is awarded for only one of MATH 149A or STAT 160B.

STAT 160B. Elements of Probability and Statistical Theory. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 160B. Topics include hypothesis testing, chi-square tests, and nonparametric methods. Credit is awarded for only one of MATH 149B or STAT 160C.

STAT 160C. Elements of Probability and Statistical Theory. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 160B. Topics include hypothesis testing, chi-square tests, and nonparametric methods. Credit is awarded for only one of MATH 149B or STAT 160C.

STAT 161. Introduction to Probability Models. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 160A. Topics include hypothesis testing, chi-square tests, and nonparametric methods. Credit is awarded for only one of MATH 149B or STAT 160C.

STAT 170A. Regression Analysis. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 147, STAT 155, STAT 157, or equivalents. Topics include simple and multiple linear regression, scatter-plots, and regression analysis of variance, multiple comparison procedures, regression diagnostics and power analysis.

STAT 170B. Design of Experiments. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 170A. Includes principles of design; completely randomized designs and one-way analysis of variance; complete block designs and two-factor analysis of variance; multiple comparison procedures; complete factorial experiments; fixed, random, and mixed models; split-plot designs; nested designs; analysis of covariance; sample size determination and power analysis.


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 198-I. Internship in Statistics. (1-12) Field, one to twelve hours. Prerequisite(s): STAT 100A, STAT 100B (or STAT 120A, STAT 120B), consent of instructor, upper-division standing. An internship to provide the student with statistical field experience in governmental, industrial, or research units. Each individual project must be approved by the Statistics Department and the head of the unit in which 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 16 units but not more than 12 can count toward graduation.

STAT 199H. Senior Honors Research. (1-5) Prerequisite(s): senior standing with major concentration in statistics and with consent of instructor. Course is repeatable to a maximum of 10 units.

GRADUATE COURSES

STAT 200A. Advanced Design and Analysis of Experiments. (4) Lecture; three hours; discussion, one 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; three hours; discussion, one hour. Prerequisite(s): STAT 170A, STAT 170B, STAT 171, or equivalents. Topics include factorial experiments; confounding and fractional factorial experiments for symmetrical and asymmetrical factorial experiments; orthogonal and balanced arrays; optimal fractional factorial designs; and 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; three hours; discussion, one hour. Prerequisite(s): STAT 160C or equivalents. 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; three hours; discussion, one hour. Prerequisite(s): STAT 203A. Assessing priors, nonparametric density estimation for expert group judgments, Bayesian regression, Bayesian analysis of variance, Bayesian regression with correlated disturbances and heteroscedasticity, Bayesian inference in time series models, Bayesian classification, Bayesian inference in contingency tables, Bayesian factor analysis, disputed authorship.

STAT 205. Discrete Data Analysis. (4) Lecture; three hours; discussion, one 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; three hours; discussion, one hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C or equivalents; or consent 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; three hours; discussion, one 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 210A. Theoretical Statistics and Probability. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): MATH 101B, 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; three hours; discussion, one 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; three hours; discussion, one hour. Prerequisite(s): STAT 210B. Topics include hypothesis testing, sequential inference, distributions, and free and robust techniques.


STAT 216A. Time Series Analysis. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 170A, STAT 170B, STAT 171, 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; three hours; discussion, one 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; three hours; discussion, one hour. Prerequisite(s): STAT 160A or equivalent. Topics include special analysis and estimation, cluster analysis, and density estimation. Normal, Wishart, Hotelling's T-squared, multivariate T, multivariate log-normal, etc.

STAT 220B. Multivariate Analysis. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): STAT 220A or consent of instructor. Topics include categorical dependent variable regression, log-linear models, influence functions, and the multivariate normal mixture. Each individual multiple regression, hypothesis testing, likelihood ratio tests, multivariate analysis of variance and covariance, principal components analysis, factor analysis, and classification and discrimination models.


STAT 232. Statistics for Management. (4) Lecture; three hours; discussion, one hour. Prerequisite(s): MGT 403 or equivalent; familiarity with Microsoft's Excel spreadsheet software. Teaches how to generate decision-making information from data and solve 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. Cross-listed with MGT 201.

STAT 240. Nonparametric Methods. (4) Lecture; three hours; consultation, one hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C. Theory of distribution-free

STAT 251. Statistics Colloquium. (1) Seminar, one and one-half hours. Prerequisite(s): none. Presentation of current research in statistics by faculty, advanced graduate students and guest lecturers. Graded Satisfactory (S) or No Credit (NC).

STAT 252. Spatial Statistics. (3-4) Seminar, three hours; discussion, one 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.

STAT 258. Practical Problems in Statistics. (2) Seminar, two hours. Prerequisite(s): consent of instructor. A variety of practical statistical problems will be presented and discussed. Graded Satisfactory (S) or No Credit (NC).

STAT 288. Literature Seminar. (1) Seminar, one 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. (1-4) 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. (1-4) Consultation, one to six 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) Research, three to twelve 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 293A. Statistical Consulting and Data Analysis. (2-4) Lecture, two to three hours; consultation, one 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 organization of consulting centers. Students present written and oral reports and technical talks. Graded Satisfactory (S) or No Credit (NC).

STAT 293B. Statistical Consulting and Data Analysis. (2-4) Workshop, two to four hours. Prerequisite (s): STAT 293A or consent of instructor. Organization and implementation of group and individual consulting activities. Students consult with clients from a variety of disciplines, analyze data, and present written and oral reports to clients. Involves presentations of topics related to data analysis projects. Graded Satisfactory (S) or No Credit (NC).

STAT 293C. Statistical Consulting and Data Analysis. (2-4) Workshop, two to four hours. Prerequisite (s): STAT 293B or consent of instructor. Students consult with clients from a variety of disciplines, analyze data, and present written and oral reports to clients. Involves presentations of topics related to data analysis projects. Graded Satisfactory (S) or No Credit (NC).

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, three to twelve 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

D. Eric Barr, M.F.A., Chair
Department Office, 121 Arts (909) 787-3343; theatre.ucr.edu

Professors
D. Eric Barr, M.F.A.
Richard Hornby, Ph.D.
Carlos Morton, Ph.D.

Professor Emeritus
Richard D. Risso, Ph.D.

Assistant Professor
Robin Russin, M.F.A.

Lecturers
Marc L. Longlois, M.F.A.
Kevin Morrissey, M.F.A.
Patricia A. Paine, 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.

Student assistantships, work-study, Gluck Fellowships, and scholarships such as the Chancellor’s Performance Award and ArtsBridge are available to students. For further information or a department tour, call the Theatre Department, (909) 787-3343.

Degree Requirements

University Requirements

See the Undergraduate Studies section for requirements that all students must satisfy.

College Requirements

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

Major Requirements

The major requirements for the B.A. degree in Theatre are as follows:

Upper-division requirements (64 units)

1. Literature, History, Criticism requirement
   a) THEA 100, THEA 120A, THEA 120B, THEA 120C
   b) Twelve (12) units from THEA 121 (E-Z), THEA 123, THEA 124A, THEA 124B, THEA 125 (E-Z), THEA 126, THEA 191 (E-Z), or any other course in dramatic literature approved by the chair

2. Performance, Direction, Playwriting, Screenwriting, Design, and Theatre Technology requirement
   a) THEA 101, THEA 102, THEA 109
   b) Twelve (12) units from THEA 110A, THEA 110B, THEA 111A, THEA 111B, THEA 111C, THEA 112, THEA 113 (E-Z), THEA 132, THEA 133, THEA 135, THEA 141, THEA 142, THEA 143, THEA 144, THEA 150A, THEA 150B, THEA 150C, THEA 164A/CRWT 164A, THEA 164B/CRWT 164B, THEA 164C/CRWT 164C, THEA 166A/CRWT 166A/FVC 166A, THEA 166B/CRWT 166B/FVC 166B, THEA 166C/CRWT 166C/FVC 166C

3. 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.

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 (Ad-
LOWER-DIVISION COURSES

THEA 010. Introduction to Acting. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): none. Introduction to acting in theatre, film, television, and performance art. Through exercises, lectures, videos, and on-site visits, students explore the worlds 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, three hours; discussion, one hour. Prerequisite(s): none. An introduction to U.S. Latino theatre and film from 1965 to the present. Students read the major works of authors and examine important films and videos. Cross-listed with ENGL 021 and FVC 025.

THEA 022. Shakespeare in Performance. (4) Lecture, two hours; workshop, two 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 3: Introduction to Design in Film, Television, and Theatre. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. An introduction to the design process for film, television, and theatre. Through exercises, lectures, videos, and on-site visits, students explore the design process, the influence of design on the viewer, and how looks are achieved in different media. Cross-listed with ART 028 and FVC 028.

THEA 050. Public Speaking. (4) Lecture, three hours; discussion, one hour. The principles and practice of effective speech composition and delivery. The course is designed to provide students, in all areas, the opportunity to learn communicative skills which are essential in professional careers and community life.

THEA 066. Screenwriting: An Introduction and Survey. (4) Lecture, three hours; screening, three hours. Prerequisite(s): none. Introduces screenwriting and the ways in which screenplays impact society. Examines a wide range of films, from early silent films to modern mini-series, hour-long dramas, sitcoms, and animation productions. Cross-listed with CWRT 066 and FVC 066.

THEA 070. Living Theatre. (4) Lecture, three hours; discussion, one 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.

UPPER-DIVISION COURSES

THEA 100. Play Analysis. (4) Lecture, four hours. Prerequisite(s): upper-division standing or consent of instructor. Close analysis of selected plays: structure, character, imagery. M.

THEA 101. Introduction to Design. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. Comprehensive introduction to the design process. Topics include introductory principles and practices of set, costume, and lighting design; theory; the general history of design; and career opportunities in the field.

THEA 102. Production Techniques for Theatre, Film, and Television. (4) Lecture, three hours; laboratory, five hours. Prerequisite(s): upper-division standing or consent of instructor. A study of technical production practices, equipment, and architecture for theatre, film, and television design. The laboratory explores the application of production practices and principles of stagecraft in the fabrication of scenic, costume, lighting, and sound design.

THEA 109. Acting: The Process. (4) Lecture, three hours; studio, two hours. Prerequisite(s): upper-division standing or consent of instructor. A comprehensive introduction to the process of acting. Focuses on theories, objectives, and expressive skills related to theatrical performance.

THEA 110A. Acting: Fundamentals. (4) Lecture, two hours; studio, four hours. Prerequisite(s): THEA 109 or consent of instructor. A study of the acting fundamen-

tals. 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, two hours; studio, four 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, two hours; studio, four hours. Prerequisite(s): THEA 110A, THEA 110B, consent of instructor. Advanced scene study in classical 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, two hours; studio, four 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 111C. Acting: Styles. (4) Lecture, two hours; studio, four hours. Prerequisite(s): THEA 111B, consent of instructor. Advanced scene study in contemporary theatre. Topics emphasized include preparing for auditions and entering the profession.

THEA 112. Dramatic Interpretation. (4) Lecture, four hours. Vocal presentation of text; the use of various literary forms, emphasizing rhythm, tonality, diction, imagery, focus and phrasing as implements to convey the text, character, actions and intentions.

THEA 113 (E-Z). Movement for Actors and Performers. (4) Lecture, two hours; workshop, two hours. Prerequisite(s): upper-division standing or consent of instructor. A study of movement techniques and theories for actors and performers. E. Stage Combat; M. Mime; N. Nonverbal Theatre.

THEA 120A. Literature and History of the Theatre: The Classical Period through the Italian Renaissance. (4) Lecture, three hours; discussion, one 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, three hours; discussion, one 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 representa-

tive plays, theatrical architecture, and production modes.

THEA 120C. Literature and History of the Modern and Contemporary Theatre. (4) Lecture, three hours; discussion, one 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 (E-Z). World of the Play. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. Studies of significant plays in the contexts of the social, intellectual, and artistic movements of their times. Each segment focuses on a single play and is offered simultaneously with the
THEA 123. The History of Scenic Design. (4) Lecture, three hours; consultation, one hour. Prerequisite(s): upper-division standing or consent of instructor. Traces the development of space and scenic design from their beginnings in the classical Greek theatre to the present as well as the evolution of scenic design into a highly specialized twentieth-century art form.

THEA 124A. American Theatre, 1900-1945. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. Examines the major American playwrights, theatrical figures, and movements from 1900 through World War II.

THEA 124B. American Theatre, 1945-Present. (4) Lecture, three hours; discussion, one 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, four hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the plays, playwrights, and theatrical figures from 4000 B.C. to A.D. 1700.

THEA 126. History of Dress. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): upper-division standing or consent of instructor. A study of the ideas of important theatre artists such as Konstantin Stanislavsky, E. Gordon Craig, Antonin Artaud, and Bertolt Brecht.

THEA 127. Theories of the Modern Theatre. (4) Lecture, four hours. Prerequisite(s): upper-division standing 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. Designing Light for Theatre, Film, and Television. (4) Lecture, three hours; laboratory, four 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 135. Costume Design for Theatre. (4) Lecture, three hours; one hour. Prerequisite(s): THEA 101. A study of theory, principles, and practice of costume design for theatre.

THEA 141. Drafting Scenery for Theatre, Film, and Television. (4) Lecture, four hours. Prerequisite(s): THEA 102 or consent of instructor. A study of basic drafting principles. Focuses on graphic skills and work habits needed to develop a fully documented scenic design. Topics include line weights, lettering, orthographic projection, auxiliary views, and mechanical perspective.

THEA 142. Costume Construction. (4) Lecture, two hours; laboratory, six 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, fitting, and sewing techniques. Costume projects are required. Sewing skills are helpful but not essential.

THEA 143. Scene Painting. (4) Discussion, four hours. Prerequisite(s): upper-division standing or consent of instructor. A study of the skills needed to translate scaled painted elevations to full-size, two-dimensional and three-dimensional scene elements. Covers fundamentals of scene painting technique 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, four 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 150A. Directing. (4) Lecture, four 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, four hours. Prerequisite(s): THEA 150A or consent of instructor. An examination of the rehearsal process with a focus on combining elements of text, acting, and design.

THEA 164A. Beginning Playwriting. (4) Seminar, three hours; discussion, one hour. Prerequisite(s): THEA 101 or CRWT 056 or consent of instructor. Seminar in the practice of playwriting centered on the construction of a play. Cross-listed with CRWT 164A.

THEA 164B. Intermediate Playwriting. (4) Seminar, three hours; discussion, one hour. Prerequisite(s): THEA 164A or CRWT 164A. Seminar in the practice of playwriting. Revisions of works in process with emphasis on character development and techniques for writing dialogue. Cross-listed with CRWT 164B.

THEA 164C. Advanced Playwriting. (4) Seminar, three hours; discussion, one hour. Prerequisite(s): CRWT 164B or THEA 164B. Seminar in the practice of playwriting. Playwrights’ participation in staged readings of their work. Consent of instructor, course is repeatable to a maximum of 8 units. Cross-listed with CRWT 164C.

THEA 165A. Plays in Production. (4) Workshop, eight hours. Prerequisite(s): CRWT 164A/THEA 164A or CRWT 166A/FNC 166A/TEHA 166A or consent of instructor. Development and preproduction of half-hour or one-hour plays written specifically for stage, soundstage, radio, television, or Web-based broadcasting. Students learn the basics of sound and video production to enhance their writing and rewriting process. Course is repeatable to a maximum of 8 units. Cross-listed with CRWT 165A.

THEA 165B. Plays in Production. (4) Workshop, eight hours. Prerequisite(s): CRWT 167A/TEHA 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, two hours; discussion, two hours. Prerequisite(s): CRWT 056 or consent of instructor. Explores the fundamentals of screenwriting including story development, plotting, and characterization as they are used in creating a complete script for television or feature film. Cross-listed with CRWT 166A/FNC 166A.

THEA 166B. Screenwriting: Outline to First Draft. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): CRWT 166A/FNC 166A/TEHA 166A or consent of instructor. Explores the fundamentals of screenwriting including 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 166A/FNC 166B.

THEA 166C. Screenwriting: Rewrites and Writing for Television. (4) Lecture, two hours; discussion, two hours. Prerequisite(s): CRWT 166A/FNC 166A/TEHA 166A or consent of instructor. Explores the fundamentals of screenwriting including 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 166A/FNC 166C.

THEA 170. Advanced Dramatic Production. (1-4) Studio, five to twenty 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, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. A survey of music, dance, theater, and ritual in four major cultural 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, four hours. Prerequisite(s): upper-division standing or consent of instructor. For THEA 180T, THEA 100 or THEA 101 or THEA 102 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; T. Computer-Aided Design for Theatre.

THEA 189. ArtsBridge. (1–4) Workshop, five hours per quarter; consultation, five hours per quarter; extra preparation or extra reading, three hours per week; field work, one and one half to six hours per week. Prerequisite(s): consent of instructor; demonstrated ability or knowledge in the practice and production of the arts. Advanced assignments in K-12 arts outreach along with workshops to explore the pedagogical requirements for and teaching techniques to be used by ArtsBridge scholars. For information on the ArtsBridge program see department. Course is repeatable to a maximum of 16 units. Cross-listed with AHS 189, ART 189, CRWT 189, DNCE 189, and MUS 189.

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, three hours; discussion, one hour. Prerequisite(s): consent of instructor. A changing seminar in such fields as playwriting, acting, directing, scenic design, theatre history, and dramatic literature. M. American Frontier in American Drama; N. Theatre of Eugene O’Neill; S. Script to Production; W. Women in Theatre.

THEA 195. Senior Thesis. (1-4) Thesis, three to twelve 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. Individual Internship in Theatre. (1–12) Internship, two to twenty-four hours; reading and written work, one to twelve hours. Prerequisite(s): upper-division standing; consent of instructor. An internship in a theatre, television, or film production company. The student works two or more hours per week 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 200. Advanced Play Analysis. (4) Seminar, four hours. Prerequisite(s): graduate standing or consent of instructor. Analysis of dramatic structure from a sophisticated perspective. Covers strategies for dealing with openness, ambiguity, and metamorphosis. Also discusses tied verses, gratuitous elements, archetypes, motifs, and symbolism.

THEA 227. Theories of the Modern Theatre. (4) Seminar, four hours. Prerequisite(s): graduate standing or consent of instructor. Examines the major theories underlying twentieth-century theatre practice. Emphasis is on the wide range of styles in modern theatre, including realism, symbolist, expressionism, surrealism, absurdism, Epic Theatre, and Theatre of Cruelty.

THEA 264. Seminar in Playwriting. (4) Seminar, three hours. 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.

THEA 266. Screenwriting. (4) Workshop, four hours. Prerequisite(s): graduate standing or consent of instructor. Intensive formal study of contemporary screenwriting with emphasis on style, structure, format, and form. Primary focus is on the production of original screenplays. Course is repeatable.

THEA 281. Oscar Wilde and Late Victorian Theatre. (4) Seminar, four hours. Prerequisite(s): graduate standing or consent of instructor. Oscar Wilde (1854-1900), an Irish, feminist, aesthete, socialist, homosexual Victorian author, becomes a focus for the study of late Victorian theatre and culture. Readings are of Wilde’s plays and non-dramatic writings and plays by related playwrights such as Ibsen and Shaw.

THEA 290. Directed Studies. (1-6) Outside research, three to eighteen hours. Literature studies, directed by a faculty member, on special topics. Course is repeatable.

UCR WASHINGTON CENTER PROGRAM

Sharon V. Salinger, Ph.D., UCR Director
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The UCR Washington Center 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 offers an exciting opportunity to combine course work with field research and internship experience. Students can take tours of local sites and weekend trips to Mt. Vernon or dialogue with distinguished professionals in the Speaker Series. For more information see UC Washington Center in the front of this catalog.

UPPER-DIVISION COURSES

HASS 191W. Seminar in Washington, D.C. (4)
Seminar, three hours; outside research, three 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. A substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C., is required. Required of participants in the UCR Washington Center Program. Cross-listed with HASS 191W.

NASC 191W. Seminar in Washington, D.C. (4)
Seminar, three hours; outside research, three 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. A substantial research paper or project, the result of guided independent work drawing on the unique aspects of Washington, D.C., is required. Required of participants in the UCR Washington Center Program. Cross-listed with HASS 191W.

UNIVERSITY HONORS PROGRAM

Subject abbreviation: HNPG

John M. Fischer, Ph.D., Director
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Committee in Charge
John C. Briggs, Ph.D. (English)
Michael F. Dunn, Ph.D. (Biochemistry)
Randolph C. Head, Ph.D. (History)
Qing Jiang, Ph.D. (Engineering)
Conrad Rudolph, Ph.D. (Art History)
Marlene Zuk, Ph.D. (Biology)

Outstanding students from most disciplines and majors can participate in the University Honors Program (UHP). 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 particular interests. UHP seminars expose students to methods of conceptualizing issues and framing questions that characterize disciplines. These seminars help prepare students for the independent research that upper-division honors demands. In the junior and senior years, each student in the UHP selects a topic for an honors project or thesis and pursues this topic under the supervision of an individual faculty member. The thesis or project is submitted by the end of the senior year. In both the upper division and lower division, the UHP challenges honors students to take an active role in shaping their education.

The program offers a variety of extracurricular activities. The UHP offers staff support for honors students, including support for fellowships, internships, applying to graduate schools, and summer programs. A reading room, seminar room, and lounge and work space with computer facilities are available to honors students.

Lower-Division Courses
Admission to lower-division honors is based on an application, high school grades, and aptitude and achievement test scores. Students take honors courses and participate in workshops, personal growth, and community service activities.

Upper-Division Honors
The upper-division UHP provides the student 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.

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 focus, select a faculty supervisor, and prepare to undertake the honors project. The UHP 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 is submitted to the faculty advisor and to a second faculty reader for approval. The approved thesis, 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 University Honors Program encourages students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to 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 see the University of California’s EAP Web site at www.uoeap.ucsb.edu or contact UCR’s International Services Center at (909) 787-4113.

See Education Abroad Program under International Services Center in the Student Services section of this catalog. A list of participating
problems of college life and learn the art of moral reasoning and dialogue, which can then be applied to other situations. Students review case studies and explore selected themes central to the college experience nationwide. Satisfactory (S) or No Credit (NC) grading is not available.

HNPG 010A. First-Year Colloquium. (1) Colloquium, two hours. Prerequisite(s): open only to students in the University Honors Program who are freshmen or first-year transfer students. A series of presentations on basic research skills and resources available at UCR. Topics include campus computing, library resources computing, career planning, education abroad, and internships. A five to eight page research project is required. Graded Satisfactory (S) or No Credit (NC). Credit is awarded for only one of HASS 001, HASS 002, or HNPG 010A.

HNPG 010B. First-Year Colloquium. (1) Colloquium, two hours. Prerequisite(s): open only to students in the University Honors Program who are freshmen or first-year transfer students. Presentations by professors from various UCR departments on their research. Team of students interview the professors and present their results to the group. Graded Satisfactory (S) or No Credit (NC). Course is repeated to a maximum of 2 units.

HNPG 020. The Nature of Academic Research. (4) Seminar, three hours; outside research, three 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. Credit is awarded for only one of ANTH 118G, HNPG 020, or one of the following segments.

HNPG 023 (E-Z). Honors Seminar in Mathematics, Statistics, and Computer Science. (4) Seminar, three 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 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, three 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 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, three 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 Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.

HNPG 026 (E-Z). Honors Seminar in Natural Sciences and Mathematics. (4) Seminar, three 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 Executive Committee in consultation with departments. Satisfactory (S) or No Credit (NC) grading is not available.
HNP 041 (E-Z). Honors Seminar in Economics and Political Science. (4) Seminar, three 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.

HNP 042 (E-Z). Honors Seminar in Anthropology, Psychology and Sociology. (4) Seminar, three 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.

HNP 043 (E-Z). Honors Seminar in Social Sciences. (4) Seminar, three 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.

HNP 097. Honors Lower-Division Research. (2-4) Consultation, one to four hours; outside research, two to four hours; term paper, two to four 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.

UPPER-DIVISION COURSES

To complete the university Upper-Division Honors the- sis students work with individual departments under the 199H or 198 series to be awarded credit for their projects. See course descriptions under appropriate departments.

LOWER-DIVISION COURSES

URST 010. The City: An Introduction. (4) Lecture, three hours; extra reading, three 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. Butler

URST 014. Popular Musics of the World. (4) Lecture, three hours; discussion, one 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, three hours; discussion, one 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. Morton

WESTERN AMERICAN STUDIES MINOR

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Committee in Charge
Edna Bonacich, Ph.D. (Ethnic Studies/Sociology)
Pieter S. Govereck, Ph.D. (History)
R. E. Taylor, Jr., Ph.D. (Anthropology)
Ronald C. Tobe, Ph.D. (History)
Clifford E. Trafzer, Ph.D. (History)
P. O'Brien, 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:

1. HISA 137, HISA 138

2. One course from each of the following groups:
   a) ETST 004/HIST 004, ETST 180/HISA 140, ETST 181/HISA 141, ETST 182/HISA 142, ETST 183/HISA 143
   b) ANTH 115E, ANTH 140F, ETST 110M
   c) 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.

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 departmental student affairs office in the College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

**College Requirements**

See Degree Requirements, College of Humanities, Arts, and Social Sciences, in the Undergraduate Studies Section, for requirements that students must satisfy.

**Major Requirements**

The major requirements for the B.A. degree in Women’s Studies are as follows:

1. Lower-division requirements (12 units)
   a) WMST 001
   b) WMST 010 or MUS 005
   c) WMST 020

2. Upper-division requirements (36 units)
   a) WMST 100
   b) At least two of the following: WMST 193, WMST 195, WMST 198-I
   c) Twenty-four (24) units of electives chosen from the list below with the following distribution requirements:
      (1) Four (4) units of course work 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
      (2) Four (4) units course work focusing on issues of sexuality, sexual orientation, sexual identification, or masculinity and femininity
      (3) No more than 4 units in WMST 190, WMST 195, WMST 195, or WMST 198

**Elective Course Work**

Upper-division Women’s Studies courses or courses in another department that are cross-listed with Women’s Studies.

Courses in other departments that are not cross-listed with Women’s Studies and are on the following “approved elective” list:

- ANTH 133 (Women in Cross-Cultural Perspective)
- ENGL 122 (Literature and Sexualities)
- ENGL 123A (Women and Literature: Poetry)
- ENGL 123B (Women and Literature: Autobiography)

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

**Major**

The major consists of 24 units distributed as follows:

1. Eight (8) units chosen from WMST 001, WMST 010, WMST 020
2. Four (4) units from WMST 100 or WMST 193
3. Twelve (12) units from the elective list above (No more than 4 units may be in WMST 190.)

See Minors under the College of Humanities, Arts, and Social Sciences in the Undergraduate Studies section of this catalog for additional information on minors.

**Education Abroad Program**

The Women’s Studies Department encourages students to participate in the Education Abroad Program (EAP). The EAP is an excellent opportunity to travel and learn more about another country and its culture while taking courses which earn units toward graduation. In addition to year-long programs, a wide range of shorter options is available. While on EAP, students are still eligible for financial assistance. Students are advised to plan study abroad well in advance to ensure that the courses taken fit with their overall program at UCR. Consult the departmental student affairs
WMST 001. Gender and Sexuality. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. Introduction to theories of sex and gender differences, the origins of patriarchy, and variations in sexual behavior and sexual norms. Fulfills the Social Sciences Requirement for the College of Humanities, Arts, and Social Sciences.

WMST 010. Women and Culture. (4) Lecture, three hours; discussion, one hour. Prerequisite(s): none. The roles of women in cultural creation and production; the relation of women artists to the society of their time; 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 020. Women, Feminism, and Society in a Global Perspective. (4) Lecture, three hours, discussion, one hour. Prerequisite(s): none. An introduction to social, political, and legal issues surrounding women’s issues and feminist movements worldwide. Topics such as abortion, contraception, and sexual violence are examined within a comparative and international framework. Fulfills either the Humanities or Social Sciences requirement for College of Humanities, Arts, and Social Sciences, but not both.

WMST 030. Violence Against Women. (4) Lecture, three hours; individual study, three 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 031H. Fulfills the Social Sciences requirement for College of Humanities, Arts, and Social Sciences.

WMST 030H. Violence Against Women. (4) Seminar, three hours; individual study, three 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 031H. Fulfills the Social Sciences requirement for College of Humanities, Arts, and Social Sciences.

WMST 031H. Latina Women in Literature and Culture. (4) Seminar, three hours, extra reading, one hour; outside research, term paper, one 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.

WMST 100. Gender Theory. (4) Lecture, three hours; extra reading, three 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 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, three hours; outside research, three hours. Prerequisite(s): WMST 101 or consent of instructor. Considers ways in which women’s labor is key to the growth of transnational corporations. 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 102. Gender, Race, and Aesthetics. (4) Lecture, three hours; extra reading, four hours. Prerequisite(s): upper-division standing or consent of instructor. Discusses cultural "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 031H. Fulfills the Social Sciences requirement for College of Humanities, Arts, and Social Sciences.

WMST 103. Sexualities and Culture. (4) Lecture, three hours; extra reading, three 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. By discussing key concepts in black feminist literary studies and visual cultures, explores the role of aesthetics in transnational black communities, arguing that these traditions are fundamentally influenced by gender. Conveys key concepts around the production and the role of aesthetics in colonialism and slavery.

WMST 108. Philosophical Issues of Race and Gender. (4) Lecture, three hours; extra reading, three 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 sexual-orientation 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, three hours; outside research, three 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 126. Gender, Sexuality, and Music in Cross-Cultural Perspectives. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines selected important aspects of the lives of Native 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.

WMST 130. Gender, Sex, and Sexuality in Early America. (4) Lecture, three hours; term paper, three hours. Prerequisite(s): upper-division standing or consent of instructor. Introduction to issues of gender, sex, and sexuality in the culture of early America. Based on both primary and secondary literature. Cross-listed with HISA 130. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

WMST 132. U.S. Women, Gender, and Sexuality 1620-1850. (4) Lecture, three hours; extra reading, three 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, three hours, outside research, three 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 135. Love, Desire, and Lesbian Sexuality. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Focuses on "text" as a way to frame one’s position, listen to women’s voices, and explore lesbian experiences. By discussing critical theory and commentaries, autobiographies, performance, and visual and popular culture, examines the cultural, political, and performance potential of lesbian subjectivity. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

WMST 140. Reproduction: Policies, Politics, and Practices. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines reproductive policies, politics, and practices from a cross-cultural and historical perspective. Discusses political and economic policies, and cultural dynamics, population control, sex preference, infanticide and neonatal neglect, abortion, contraception, and gender issues. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

WMST 141. Ethics and Families. (4) Lecture, three hours; extra reading, three 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.

WMST 146. History of Native American Women. (4) Lecture, three hours; extra reading, three 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.
WMST 149. Gender, Kinship, and Social Change. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): WMST 001. Examines theories of gender and kinship, the formation of social 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 155. Women's Labor and the Economy. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ECON 002 and ECON 003. 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. Differences among women by race, ethnicity, class, marital status, and parental responsibilities are explored. Cross-listed with ECON 155. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

WMST 160. Women and Religion. (4) Lecture, three hours; consultation, one 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, three hours; extra reading, three hours. Prerequisite(s): WMST 001. Focuses on the intersections of Western constructions of gender and of 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, scientific agendas, the status of scientific knowledge, and the emergence of feminist science studies. Cross-cultural comparisons and literary works are also brought to bear on these questions.

WMST 163. The Women of Early Christianity. (4) Lecture, three hours; individual study, three 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, three hours; extra research, three 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 INST 164. Fulfills the Social Sciences requirement for the College of Humanities, Arts, and Social Sciences.

WMST 165. Gender, Identity, and Visual Display in Washington, D.C. (4) Lecture, three hours; extra reading, three 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 ABS 165.

WMST 170. Women Artists in Renaissance Europe, 1400-1600. (4) Lecture, three hours; individual study, three hours. Prerequisite(s): ABS 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 AIB 165 and HISE 133. Fulfills the Humanities requirement for the College of Humanities, Arts, and Social Sciences.

WMST 171. Gender and African Diasporic Writing. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): upper-division standing or consent of instructor. Examines the intersection between gender, race, and geography in contemporary fiction of the African diaspora. Examines dilemmas in diaspora studies and feminist studies and offers theories on gender as being meaningful in the context of race, class, and nation.

WMST 175. Gender, Ethnicity, and Borders. (4) Lecture, three hours; extra reading, three hours. Prerequisite(s): ETST 001 or WMST 010 or upper-division standing or consent of instructor. Examines the intersection between gender, race, and geography in contemporary fiction of the African diaspora. Examines dilemmas in diaspora studies and feminist studies and offers theories on gender as being meaningful in the context of race, class, and nation. Cross-listed with ANTH 164 and LNST 164.

WMST 195. Senior Thesis. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): upper-division standing or consent of instructor. Independent study and research by qualified undergraduate students. Course is repeatable to a maximum of 8 units.

WMST 254. Writing Women: Issues in Feminism(s), Representation, and Ethnographic Practice. (4) Seminar, three hours; outside research, three hours. Prerequisite(s): graduate standing or consent of instructor. Examines intersections of power, authority, and representation in the gendered methodologies entailed in the production of anthropological knowledge. A focus on postcolonial and feminist theorizing introduces students to novel debates about ethnographic writing and practices. Text, context, and reflexivity in writing are explored in depth. Cross-listed with ANTH 254. Chatterjee

WMST 302. Teaching Practicum. (2-4) Seminar, two hours; outside research, one hour; practicum, one to two hours; extra reading, two to three 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).
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Manager, Service Enterprises .............................. Dallas Johnson, A.A.
Director, Student Business Services .............................. Carol Mahlum, B.A.
Director, Student Life and Leadership .............................. Kevin W. Ferguson, M.A.
Director, Student Special Services .............................. Lenita Kellestrand, B.S.
Director, Undergraduate Admissions .............................. LaRae Lundgren Tunson, M.A.
Coordinator, University/Eastside Community Projects .............................. Lucia Ortega

Chief Campus Officers
Provost 1949–56 .............................. Gordon S. Watkins
Provost 1956–58; Chancellor 1958–66 .............................. Herman Spith
Chancellor 1964–1979 .............................. Tomás Rivera
Chancellor 1992–2002 .............................. Raymond L. Orbach
Chancellor 2002– .............................. France A. Córdova
APPENDIX A

Residence for Tuition Purposes

If you have not been living in California with the intent to make it your permanent home for more than one year immediately before the residence determination date for each term in which you propose to attend the university, you must pay nonresident 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, and for schools on the semester system, 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 U.S. 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.

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 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 previous 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 U.S. under the terms of a nonimmigrant visa that precludes you from establishing domicile in the U.S., 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 entitled to residence 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 your parent(s) departure, (b) you enroll in a California public postsecondary institution within one year of your parent(s) departure, 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.

Exemptions from Nonresident Tuition

Member of the Military

If you are a member of the U.S. Military stationed in California on active duty, unless you were assigned for educational purposes to a state-supported institution of higher education, you may be exempt from nonresident tuition until you have lived in California long enough to become a resident. You must provide the residence affairs officer with a statement from your commanding officer or personnel officer stating that your assignment to active duty in California is not for educational purposes. The letter must include the dates of your assignment to the state.

Appendices
spouse or a natural or adopted child or stepchild who is a dependent of a member of the U.S. military stationed in California on active duty. The exemption is available until you have lived in California long enough to become a resident. You must petition for a waiver of nonresident tuition each term you are eligible. If you are enrolled in a postsecondary educational institution and the member of the military is transferred on military orders to a place outside California where he or she continues to serve in the Armed Forces, or the member of the military retires from active duty immediately after having served in California on active duty, you may retain this exemption under conditions listed above.

Child or Spouse of a Faculty Member
To the extent of funds available, if you are an unmarried dependent child under age 21 or the spouse of a member of the university faculty who is a member of the Academic Senate, you may be eligible for a waiver of nonresident tuition. Confirmation of the faculty member’s membership on the Academic Senate must be secured each term.

Child or Spouse of University Employee
You may be entitled to a waiver of nonresident tuition if you are an unmarried dependent child or the spouse of a full-time university employee whose assignment is outside California (e.g., Los Alamos Scientific Laboratory). Your parents’ or spouse’s employment status with the university must be ascertained each term.

Child or Spouse of Deceased Public Law Enforcement or Fire Suppression Employee
You may be entitled to a waiver of the nonresident tuition if you are the child or spouse of a deceased public law enforcement or fire suppression employee who was a California resident at the time of his or her death and who was killed in the course of fire suppression or law enforcement duties.

Dependent Child of a California Resident
If you have not been an adult resident of California for more than one year and are the natural or adopted dependent of a California resident who has been a resident for more than one year immediately before the residence determination date, you may be entitled to a waiver of nonresident tuition until you have lived in California the minimum time necessary to become a resident, so long as continuous attendance is maintained at an institution.

California High School Graduate
A student who attended a high school in California for three or more years and who graduated from a California high school (or attained the equivalent) may be exempt from paying nonresident tuition and the Educational Fee differential charged to nonresidents. Eligibility for this exemption will continue until the student fulfills the University of California residency requirements or until this exemption is no longer available, whichever occurs first. Check registrar.ucr.edu/residency.html for more information.

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, 1100 Hinderaker Hall, 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. You may also file a Change of Status Petition for Resident Classification through the appropriate department chair or the Academic Senate, who institutes an informal in

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Student records maintained by the Office of the Registrar include the official UCR academic record (transcript), academically-related information, and the Residence Classification form. 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 towards 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. Records are maintained by the Office of Undergraduate Admissions 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. Records are maintained by the Office of Financial Aid that 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 Services Center, Learning Center, Special Services (for disabled and veterans’ services), and Gender Education and Resource Services, should contact those offices for information. Student discipline records are kept in the Vice Chancellor, Student Affairs office. The University of California, Riverside considers the following to be public information with respect to individual students: address (campus, permanent, e-mail); telephone numbers; date and place of birth; major field of study; dates of attendance; number of enrolled units; 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 name and local telephone number to be published in the campus telephone directory must sign and date the telephone directory restriction box that appears on their PIN Enrollment Appointment and Personal Data Form and return it to the Office of the Registrar, 1100 Hinderaker Hall. 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 their PIN Enrollment Appointment and Personal Data Form and return it to the Office of the Registrar, 1100 Hinderaker Hall. 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 Regent’s Scholarship, election to Phi Beta Kappa, degree(s) granted and the date(s) conferred, and dates of attendance. Students may reverse their decision of a previous quarter on the next quarter’s PIN Enrollment Appointment and Personal Data Form. Students also have the 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 during all quarters that they are not registered at UCR, including the period following graduation. Students wishing to exercise this right shall present to the Office of the Registrar a separate written statement of the personally identifiable information related to themselves that is not to be designated as public information with respect to themselves during those absences. Copies of the University of California and UCR Policies Applicable to Disclosure of Information from Student Records are available in the following offices on the UCR campus: Office of the Executive Vice Chancellor, Office of the Registrar, Office of the Vice Chancellor for 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. APPENDIX C UCR Police Department With a daily population of about 20,000 students, faculty, staff, and visitors, UCR is comparable to a small city. There are no walls surrounding UCR, which means that there is open access to the campus 24 hours per day. Further, there are no restrictions on visitation to any campus housing area. On-campus housing facilities range from bungalows and apartments designed for student families to multistudent apartment complexes and undergraduate student residence halls. The University of California Police Department (UCPD) and residential housing personnel work closely together to support a safer and comfortable living and learning environment. Available programs and activities include Neighborhood Watch, nightly Community Service Officer (CSO) patrols (used to augment the round-the-clock police officer patrols), and dissemination of information to housing staff and residents. Police officers of the University of California Police Department are armed, duly sworn peace officers of the State of California. Empowered by section 830.2(b) of the California Penal Code, UCPD officers possess the same authority and adhere to the same state-mandated standards as municipal police officers. Therefore, under California law, UCPD officers may enforce laws and make arrests anywhere in the state; however, they concentrate their efforts on the campus and its immediate environs. UCPD officers may work in uniform or plainclothes. They provide a full range of police-related services including primary emergency responses; preventive patrols; initial investigation of observed, reported, or suspected crimes; enforcement of all applicable laws; follow-up and specialized criminal investigations; crime prevention; community liaison and relations; V.I.P./dignitary protection; special event security; traffic enforcement and accident investigation; parking enforcement; and, on occasion, campus escorts of students, faculty, or staff. Persons arrested by UCPD officers are processed in accordance with prevailing practices in Riverside County which can include citation and release; booking into the Riverside County Jail; filing of charges with, and prosecution through, the District Attorney’s Office; and formal trial. Additionally students, faculty, and staff may be subject to university administrative sanctions. Community Service Officers (CSOs) are student employees. They wear distinctive shirts or jackets, are not armed, and perform many specialized services for the community, including special event security, contract security patrols (e.g., campus housing areas, Physical Education facilities), campus building security checks, unlocks and lockups, and occasionally, campus escorts.
Incident Reporting
The university endorses a reporting policy that strongly encourages victims to report all criminal incidents to the police immediately, regardless of their nature. It is important that all crimes occurring on campus be reported to ensure that appropriate action can be taken.

On-campus crimes should be reported to the UCPD, and off-campus crimes need to be reported to the law enforcement agency having jurisdiction over the location of occurrence. Emergencies are best reported using available telephone 9-1-1 systems, and non-emergencies are better reported using routine channels.

The UCPD has the primary jurisdiction and responsibility for investigating crimes and providing police services to the University of California campus. The City of Riverside Police Department does not handle calls for services on the campus; they refer such calls to the UCPD.

Emergencies
Any police, fire, or medical emergency on campus can be reported using a variety of methods, including the 9-1-1 emergency reporting system, campus Emergency Call Boxes, campus emergency phones, or by walk-in reporting to the Police Department.

9-1-1 The UCPD is the Public Safety Answering Point (PSAP) for all 9-1-1 calls originating from campus telephones. UCPD coordinates all emergency responses requiring police officers, fire department personnel, paramedics, or emergency medical transportation. To utilize the 9-1-1 reporting system:

- If there is a 9-1-1 instruction sticker on the phone, follow the directions.
- On any campus phone requiring a 9 to be dialed for an off-campus line, pick-up the receiver, then dial 9-9-1-1.
- On any campus pay phone, pick-up the receiver, wait for a dial tone, then dial 9-1-1.

Emergency Call Boxes Emergency Call Boxes (ECBs) are located in, or adjacent to, most campus parking lots. They are connected to the Police Department communications center by cellular telephones, and each one emits an identifier code which alerts the police dispatcher to the location of the box being activated. It is important for campus community members to learn the locations of ECBs, especially those located along frequently traveled campus routes. Maps are available from UCR Parking Services which denote the locations of ECBs. To use the system, open the box, lift the telephone receiver, and press the button.

Campus Emergency Phones Campus emergency phones are located in various campus buildings and in all campus building elevators. They are connected directly to the UCPD Communications Center.

To use an emergency phone, simply pick up the receiver and wait for the police dispatcher to come on the line.

Walk-in Reporting The Police Department Station is located at 5500 Canyon Crest Drive, adjacent to Lot 24. Since the department operates 24 hours per day, 365 days per year, emergencies may be reported by going directly to the Police Station.

Campus Safeguards
It is well recognized that the prevention of crime provides the best measure of protection. Therefore, the UCPD works closely with the members of the community to make UCR a safer place to work, live, and learn.

The department provides and collaborates in presentations on topics such as personal safety, vehicle and residential security, office and equipment security, and rape prevention. Brochures and literature on crime prevention and personal safety are available through the department’s investigations/crime prevention office.

To increase awareness of campus safety at UCR, incidents of criminal activity within the campus community are publicized in many ways: distribution of the UCPD Annual Report and Crime Statistics; maintenance of an ongoing “press log”; dissemination of Community Crime Alert Bulletins (posters); the “Rap Sheet” column in the Highlander student newspaper; a Web page (police.ucr.edu); “Crime Watch” columns in campus housing newsletters; regular police activity reports to campus housing administrators; and through crime prevention programs.

APPENDIX D
Salary and Employment Information

Average Monthly Salary from UCR and Representative Colleges and Universities

<table>
<thead>
<tr>
<th>Field of Study</th>
<th>Bachelor’s</th>
<th>Master’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Administration</td>
<td>$2,947</td>
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<tr>
<td>Economics</td>
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<td>$4,688</td>
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<tr>
<td>Engineering</td>
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<tr>
<td>Computer Science</td>
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<tr>
<td>Mathematics</td>
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<tr>
<td>Physical Sciences</td>
<td>$5,073</td>
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2001 UCR Graduates Six Months After Graduation

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Employed full time</td>
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<tr>
<td>Employed part time</td>
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<td>Enrolled in further education</td>
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<td>Unemployed and seeking work</td>
<td>5%</td>
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<tr>
<td>Unemployed and not seeking work</td>
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APPENDIX E
Campus Policies and Regulations Applying to Students

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.

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 or Student Life and Leadership office. Particular attention is called to the booklet 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.

Academic Dishonesty

Policies governing grading for academic dishonesty are covered in the Academic Senate Statement of Policy on Grades and Academic Misconduct. Academic dishonesty may also involve discipline under the student conduct procedures.

Anti-hazing Policy

Hazing or any method of initiation into a student organization or any pastime or amusement engaged in with respect to such organization which causes, or is likely to cause, bodily danger, physical harm, or personal degradation or disgrace resulting in physical or mental harm to any student or other person is a misdemeanor under California law (Education Code 32050) and subject to fine and imprisonment as well as campus discipline.

A full copy of the law is available in the Vice Chancellor, Student Affairs 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, to obtain a diploma or a transcript of official record, or to participate in certain university services.
Harassment, Abusive Behavior, or Violence

Campus policy and process involving criminal sanction and campus discipline of students, faculty, or staff is outlined in the Policy Concerning Harassment, Abusive Behavior, or Violence Against a Student. It is available in the Vice Chancellor, Student Affairs office.

Nondiscrimination

Civil law remedies including, but not limited to, injunctions and restraining or other orders may also be available for various discrimination issues, including sexual harassment. See the university's nondiscrimination policy on the next page of this catalog.

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

For information on the university's sexual harassment policy, the location of information centers, and for a list of complaint resolution officers, see appendix G.

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 found in the Schedule of Classes or can be obtained from the Vice Chancellor, Student Affairs office.

APPENDIX F

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. It is the intention of the university to take whatever action may be needed to prevent, correct, and, if necessary, discipline behavior which violates this policy.

Definition

Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment 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:

2. Counseling Center, Veitch Student Center, (909) 787-5531
3. The Office of the Ombudsman, University Cottage, (909) 787-3213
4. The Office of Affirmative Action, University Cottage, (909) 787-5604

Complaint Resolution Officers

The complaint resolution officers for UCR are the Director of Affirmative Action and the Ombudsman. Both offices are in University Cottage. Title IX officer is Gary Wilkins, University Cottage, (909) 787-5604.

The University of California, Riverside's Sexual Harassment Policy applies to all students, faculty, and staff. Copies are available from the Director of Affirmative Action and the campus Ombudsman.

APPENDIX G

Nondiscrimination Statement

The University of California, in compliance with Title 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.

APPENDIX H

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 1,383 incoming first-time freshmen for Fall 1994, 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 39%
Graduated in five years 60%
Graduated in six years 64%
Literatures and Languages (see also Comparative Literature and Foreign Languages, 169–192), 190–191
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Lost and found, 63
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Campus Map
2002-2003

For updated information: campusmap.ucr.edu

Parking Permit Dispenser
Information Kiosk
Emergency Call Boxes
Campus Shuttle Stop
Under construction

Bus stops indicated with route numbers

To Chancellor's Residence 4177 Watkins

UCR Bookstore (under construction)
Parking Structure (under construction)
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<thead>
<tr>
<th>#</th>
<th>Grid</th>
<th>Building name</th>
</tr>
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<td>1</td>
<td>E3,4</td>
<td>Aberdeen-Inverness Residence Hall</td>
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<td>2</td>
<td>A10</td>
<td>Agricultural Operations</td>
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<tr>
<td>3</td>
<td>E9</td>
<td>Anderson Hall (AGSM)</td>
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<tr>
<td>4</td>
<td>D8</td>
<td>Art Annex Building</td>
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<tr>
<td>5</td>
<td>B6</td>
<td>Arts Building</td>
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<tr>
<td>6</td>
<td>A4,B4</td>
<td>Bannockburn Village</td>
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<tr>
<td>7</td>
<td>B8</td>
<td>Barn Group/University Club</td>
</tr>
<tr>
<td>8</td>
<td>E7</td>
<td>Batchelor Hall</td>
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<tr>
<td>9</td>
<td>D7</td>
<td>Bell Tower</td>
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<tr>
<td>10</td>
<td>F7</td>
<td>Biomedical Teaching Complex</td>
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<td>11</td>
<td>D6</td>
<td>Bookstore</td>
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<tr>
<td>12</td>
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<td>Botanic Gardens</td>
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<td>13</td>
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<td>E,5-6</td>
<td>Bourns Hall II (under construction)</td>
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<td>15</td>
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<td>Canyon Crest Family Student Housing</td>
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<td>18</td>
<td>E1</td>
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<td>19</td>
<td>E10</td>
<td>College Building North and College Building South</td>
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<td>20</td>
<td>D6</td>
<td>Commons</td>
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<td>21</td>
<td>G8</td>
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<td>22</td>
<td>F,G,2-3</td>
<td>Corporation Yard</td>
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<td>23</td>
<td>C6</td>
<td>Costo Hall</td>
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<td>24</td>
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<td>B4</td>
<td>Housing Administration and Cashiers</td>
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<td>B,C,7</td>
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<td>A6</td>
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<td>36</td>
<td>F9</td>
<td>Insectory and Quarantine Facility</td>
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<td>37</td>
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<td>International Village Housing</td>
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<td>39</td>
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<td>Olmsted Hall</td>
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<td>42</td>
<td>G8</td>
<td>Mobile Trailer Facilities</td>
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<td>43</td>
<td>G3</td>
<td>Parking Services</td>
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<td>44</td>
<td>G4</td>
<td>Pentland Hills</td>
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<td>Physics Building</td>
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<td>48</td>
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<td>Pierce Hall</td>
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<td>B3</td>
<td>Police Facility</td>
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<td>A4</td>
<td>Riverside Campus Federal Credit Union Building</td>
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<td>51</td>
<td>F6</td>
<td>Science Library</td>
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<tr>
<td>52</td>
<td>E7</td>
<td>Spieth Hall</td>
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<tr>
<td>53</td>
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<td>Sproul Hall</td>
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<td>54</td>
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<td>D8</td>
<td>Steam Plant (Central Utility Plant)</td>
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<td>Student Recreation Center</td>
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<td>58</td>
<td>C6</td>
<td>Surge Facility</td>
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<td>Sweeney Art Gallery</td>
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<td>60</td>
<td>A6</td>
<td>Telephone Building</td>
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<tr>
<td>61</td>
<td>D6</td>
<td>Terrace Conference Rooms</td>
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<tr>
<td>62</td>
<td>D8</td>
<td>Theatre Lab</td>
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<tr>
<td>63</td>
<td>D7</td>
<td>Tomás Rivera Library</td>
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<td>64</td>
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<td>UCR Extension Center</td>
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<td>65</td>
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<td>UCR/City Sports Center</td>
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<td>66</td>
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<td>67</td>
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<td>68</td>
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<td>A,3,4</td>
<td>University Plaza Apts.</td>
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<td>71</td>
<td>C,D,8</td>
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<td>73</td>
<td>G7</td>
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<td>74</td>
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<td>75</td>
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<td>76</td>
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<td>Watkins House</td>
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<tr>
<td>77</td>
<td>E7</td>
<td>Webber Hall</td>
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**Performance /Lecture Halls**

34a B7 Humanities 1500
39a D7 Life Science 1500
5a B6 Performance Lab Arts 166
47a F6 Physics 2000
5b B6 Studio Theatre Arts 113
72a A5 University Village Theater
75a C7 Watkins 1000 Recital Hall
HOW TO GET TO UCR

Map showing routes to UCR from various locations, including:
- To Orange Co. & Beach Cities
- To Los Angeles
- To Los Angeles & Ontario
- To San Bernardino
- To San Diego
- To Santa Monica
- To Barstow
- To Palm Springs

Map not to scale.