Division of Mathematical and Physical Sciences

These majors focus primarily on the description and interpretation of the structure, processes and events of the physical universe. They provide students the opportunity to explore in depth the structure, properties and reactions of substances; fundamental mathematical techniques and models and their application to the interpretation and explanation of phenomena; studies of matter and energy and their interconversions; the nature and development of computer languages; and earth and environmental processes. Students interested in studying these types of subjects may select from eight different majors. The division strongly encourages undergraduates to enroll in undergraduate research projects with one-on-one instruction by faculty scholar/researchers.

Majors:
- Applied Physics, B.S.
- Chemistry, A.B., B.S.
- Computer Science, B.S.
- Geology, A.B., B.S.
- Mathematics, A.B., B.S.
- Natural Sciences, B.S.
- Physics, A.B., B.S.
- Statistics, A.B., B.S.

Minors:
- Computer Science
- Environmental Geology
- Geology
- Geophysics
- Mathematics
- Physics
- Statistics

Division of Social Sciences

These majors focus largely on issues and problems that characterize social, cultural, political and economic life across human societies. They provide students the opportunity to explore the relationships between people and the groups and organizations of which they are a part, the antecedents of individual behavior, the development of political and economic systems, the social forces that have shaped the contemporary world, and the foundations of language, thought, knowledge and perception. Students interested in studying these types of issues may select from more than a dozen different majors.

Majors:
- Anthropology, A.B., B.S.
- Communication, A.B.
- East Asian Studies, A.B.
- Economics, A.B.
- History, A.B.
- International Relations, A.B.
- Linguistics, A.B.
- Philosophy, A.B.
- Political Science, A.B.
- Political Science–Public Service, A.B.
- Psychology, A.B., B.S.
- Sociology, A.B.
- Sociology–Organizational Studies, A.B.

Minors:
- Anthropology
- Communication
- East Asian Studies
• By achieving a grade of 5, 4 or 3 on the College Board Advanced Placement Examination in English.
• By achieving a score of 5 or above on the International Baccaulareate's Higher Level English A Examination.
• By entering the university with credentials showing the completion of an acceptable 3 semester-unit or 4 quarter-unit college-level course in English composition with a grade of C or better.
• By writing a passing essay on the Subject A Examination. This examination may be taken only once prior to enrollment. It is offered in the spring at local sites throughout California; a student admitted for fall quarter who has not already satisfied the Subject A requirement must take this examination. An out-of-state student or any California freshman admitted after mid-April will take another form of the Subject A Examination, which will be offered on the UC Davis campus during the orientation period each quarter. For the time and location, consult the Class Schedule and Registration Guide, published before the beginning of each quarter.

If you have not satisfied the requirement in one of the ways described above, you must enroll in English 57 during your first quarter of residence at the university, or as soon thereafter as space is available in the course. English 57, offered by Sacramento City College on the Davis campus, counts as 4.5 units on your study list and toward minimum progress but is not transferable as units toward graduation. To satisfy the requirement, students must pass the Subject A Examination offered as the final examination for English 57. Students failing the examination must repeat English 57. If the requirement has not been satisfied by the end of your third quarter, and you were not required to take courses for non-native speakers of English in the Linguistics program, you may be disenrolled from the University.

Students whose native and school language is not English, and some students whose schooling combines work in the United States and in another country, must demonstrate proficiency in English. The level of proficiency must meet the standards of both the non-native speakers of English program and the Subject A program. The results of the Subject A Examination and a special examination in English administered during the orientation period each quarter determine whether a student has met the Subject A requirement or must take specific course work in the Linguistics program. Students held for Linguistics course work have three quarters to meet the Subject A requirement plus the number of quarters required in Linguistics.

American History and Institutions

The American History and Institutions requirement ensures that every graduating student will have at least a minimum knowledge of the background of this country's development.
and an understanding of the political, economic and social interrelationships of its way of life.

You may meet this requirement in any of these ways:

• By offering one high school unit in American history, or 1/2 high school unit in American history and 1/2 high school unit in civics or American government, with a grade of C or better in each course.

• By completing any one of the following courses:
  African American and African Studies 10, 100, 120, 121
  Asian American Studies 1, 2
  Economics 111A, 111B
  Native American Studies 1, 10, 55, 116, 130A, 130B, 130C
  Political Science 1, 5, 100, 101, 102, 103, 104, 105, 106, 108, 109, 113, 130, 131, 160, 163
  (Students electing to offer one of the above courses are subject to the rules for prerequisites and majors.)

• By presenting evidence that the requirement has been accepted as satisfied at another campus of the university.

• By presenting evidence that the requirement has been satisfied through courses in the area of American History and Institutions at another collegiate institution whose credits are acceptable for transfer to UC Davis.

• By successful completion of the Advanced Placement Examination in American History or American Government and Politics.

International students, regardless of the type of visa they hold, must meet the university's American History and Institutions requirement for graduation.

Unit Requirement

A minimum of 180 quarter units is required for graduation. These must be distributed according to the minimum requirements set forth by the faculty of your college.

A maximum of 12 units of Internship Courses (92, 192, or a combination) may be counted toward the 180-unit bachelor's degree requirement.

The acceptability of transfer courses for unit credit is determined by Undergraduate Admissions and Outreach Services. The acceptability of such courses toward specific requirements is determined by the individual college or school.

Students should refer to the Advanced Placement Examination chart and their transcripts to eliminate the possibility of duplication of credit.

Residence Requirements

The minimum residence requirement for a bachelor's degree at the University of California is one academic year (three quarters). Thirty-five of the final 45 quarter units completed by each candidate must be earned while in residence on the Davis campus. Each summer session in which a student completes a course of at least 2 quarter units may be counted as half a quarter's residence. Not more than 18 of these 35 quarter units may be completed in summer session courses at UC Davis.

Regularly approved courses (laboratory, field, or other individual work) done outside of a regular session but under the direction of a department of instruction may be accepted upon the recommendation of the department in partial fulfillment of the residence requirement for the bachelor's degree. Registration is with the consent of the instructor only.

UC Davis Extension courses are not accepted as part of the university residence requirement.

There are additional residence requirements for students enrolled in the Colleges of Letters and Science and Engineering. If you are planning to study abroad during your senior year, you should consult your college dean's office.

With the approval of the dean of a student's college or school, a candidate for the bachelor's degree who was in active service in the armed forces of the United States in the year preceding the awarding of the degree may be recommended for the degree after only one quarter of university residence in which the candidate completes at least 16 units or passes a comprehensive examination in the major or field of concentration.

Scholarship Requirement

To receive a bachelor's degree, you must obtain twice as many grade points as units (a 2.0 GPA) for all courses you have attempted in the university. An exception to this rule is made for those students undertaking certain honors courses. For specific college requirements consult the college sections following.

GENERAL EDUCATION REQUIREMENT

The General Education (GE) requirement promotes the intellectual growth of all undergraduates by ensuring that they acquire a breadth of knowledge that will enlarge their perspectives beyond the focus of a major and serve them well as participants in a knowledge-based society. It seeks to stimulate continued intellectual growth by providing students with knowledge not only of the content but also of the methodologies of different academic disciplines. It involves students in the learning process by its expectation of considerable writing and class participation. It encourages students to consider the relationships between disciplines.

The GE requirement has three components: Topical Breadth, Social-Cultural Diversity and Writing Experience.

Topical Breadth

A GE course in topical breadth addresses broad subject areas that are important to the student's general knowledge. It takes a critical, analytical perspective on knowledge, considering how knowledge has been acquired and the assumptions, theories, or paradigms that guide its use.

Topical breadth courses are grouped into three broad subject areas of knowledge:

1. Arts and Humanities. Courses in this area provide students with knowledge of significant intellectual traditions, cultural achievements and historical processes.

2. Science and Engineering. Courses in this area provide students with knowledge of major scientific ideas and appli
cations. They seek to communicate the scope, power, limitations and appeal of science.

3. **Social Sciences.** Courses in this area provide students with knowledge of the individual, social, political and economic activities of people.

**Social-Cultural Diversity**

Courses in social-cultural diversity teach students the significance of the many patterned differences that characterize human populations—particularly differences of gender, race, ethnicity, sexuality, religion or social class.

**Writing Experience**

Courses in writing experience improve student writing through instruction and practice. Instruction is provided through workshops or evaluation of content, logical coherence and use of language and grammar, and require student revision during the quarter. Courses require one extended assignment (5 pages or more) or multiple short assignments.

**Fulfilling the General Education Requirement**

**Topical Breadth Component: 6 courses**

To fulfill the topical breadth component of the General Education requirement you must successfully complete three approved courses in each of the two subject areas of topical breadth other than the one that includes your major. To identify the area of topical breadth to which your major belongs, refer to the chart at the back of this catalog. Each academic major has been assigned to one of the three subject areas of GE topical breadth. If you have any questions concerning the subject area to which your major is assigned, consult your college dean’s office.

- **Double majors** will satisfy the topical breadth subject areas to which they are assigned. You will still be responsible for completing any topical breadth subject area in which you do not have a major. If, for example, two majors are assigned to the same subject area, you will need to complete the topical breadth component in each of the other two other subject areas. If, on the other hand, you complete two majors that have been assigned to two different areas of topical breadth then you will be responsible for completing the topical breadth component in only the remaining subject area.

- **Individual majors** are assigned to an area of **topical breadth** at the time they are approved by your college.

- **Each minor** has also been assigned to one of the three subject areas of **topical breadth**. A minor assigned to a subject area other than the area of your major will satisfy the GE course requirement for **topical breadth** in that subject area.

- **Courses in your major** may count toward the **topical breadth** component when those courses are also assigned to subject areas other than the area of your major.

- **A course approved in more than one topical breadth subject area** may only be offered in satisfaction of **one** of those subject areas.

**Social-Cultural Diversity Component: 1 course**

To fulfill the **social-cultural diversity** component of the GE requirement, you must successfully complete one course from the approved list at the back of this catalog.

**Writing Experience Component: 3 courses**

To fulfill the **writing experience** component of the GE requirement, you must successfully complete three courses from the approved list at the back of this catalog.

- **Subject A.** You must satisfy the university **Subject A requirement** before you take any **writing experience** course for GE credit. If you take an approved **writing experience** course but have not yet satisfied the Subject A requirement, you will not receive GE **writing experience** credit for that course.

**Additional Conditions**

1. **Letter grading.** All courses taken to fulfill the GE requirement must be taken for a letter grade. No GE credit will be awarded for a course that you take on a Passed/Not Passed basis.

2. **College and university composition requirements.** The following GE courses may not be used to satisfy university or college requirements in composition and GE writing experience simultaneously: Communication 1, Comparative Literature 1, 2, 3, 4, English 1, 3, 18, 19, 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E, Native American Studies 5.

   Remember: You must satisfy the university **Subject A requirement** before you take any **writing experience** course for GE credit.

3. **Courses approved for multiple GE components.** Courses approved for more than one component of the GE requirement (**topical breadth**, **writing experience** and **social-cultural diversity**) will be accepted toward satisfaction of all components for which the course has been approved.

4. **Approved GE courses.** You cannot claim GE credit for any course you completed before it was an approved GE course.

**GE Exemption**

IGETC, TCC, and UC Reciprocity. You are exempt from the UC Davis GE requirement if you come from a California community college and are certified as having successfully
completed the “Intersegmental General Education Transfer Curriculum” (IGETC) or “Transfer Core Curriculum” (TCC), or if you come from another UC campus and are certified as having successfully completed the lower division breadth or General Education requirements of that UC campus (UC reciprocity).

If you are in the College of Engineering and have satisfied IGETC or TCC, you are still required to complete two upper-division General Education courses at UC Davis to satisfy College of Engineering requirements.

Approved General Education Courses
A list of the courses that provide General Education credit for 2004–05 appears in the back of this catalog. Please note that you cannot claim GE credit for a course you completed before it was an approved GE course. This list is subject to change. You should check the Class Schedule and Registration Guide each quarter for the most current information.

General Education Theme Options
GE Scholars
GE Scholars is a certificate program related to the GE theme options. In addition to completing three approved courses in a GE theme option, students choose a capstone experience (either a seminar course or curriculum related internship) that integrates concepts introduced in the theme courses. Students are awarded a certificate upon completion of their capstone experience. The GE Scholars program allows you to participate in the application of knowledge gained in GE courses, focus your academic experience beyond your major and develop a secondary body of knowledge while working towards completing your GE requirement.

Contact the GE Scholars Project Manager at 754-9431; gamartinez@ucdavis.edu or go to http://gescholars.ucdavis.edu for more information.

COLLEGE REQUIREMENTS FOR THE BACHELOR’S DEGREE
College of Agricultural and Environmental Sciences
Unit Requirements
Of the required 180 units counted toward a degree, 54 units must be upper division work.

Unit Credit Limitations
In addition, the following unit limitations apply to all majors:

- Not more than 6 units can be Physical Education 1 and 6.
- Not more than 20 units can be courses numbered 90X, 92, 97T, 97TC, 99, 190C, 190X, 192, 197T, 197TC, or 199.
- Not more than 12 units can be courses numbered 92 and/or 192 (credit will not be given for 192s or 199s taken before the completion of 84 units).
- Not more than 5 units per quarter of Special Study courses (90, 194H, 199).
- Not more than 9 units of professional courses (numbers 300–499) may be used toward the 54 upper division units.

Limitation on Credit for Units Graded P. The Academic Senate limits the total number of courses graded P, including units earned in courses graded “P/NP only,” to one third of the units completed on the Davis campus. The P/NP option is to be used only for elective courses and should not be used for major requirements.

Credit in UC Davis Extension Courses. Students in residence may apply a maximum of 9 units of credit earned in some Open Campus courses taken through University Extension toward the 180-unit requirement provided written approval has been obtained from the dean before registering. Units of credit allowed by the dean may be less than the number of units listed for a course. Beginning in Fall 2003 grade points will be assigned to approved Open Campus (concurrent) courses enrolled through UC Davis Extension.

Registration Beyond the 225-Unit Limit. Students may not exceed 225 units; registration for enrollment when the limit has been reached may only be approved by the Dean. A petition to complete excess units may be picked up in the Dean’s office or in your major department.

Residence Requirement
Thirty-five of the final 45 quarter units completed by each candidate must be earned while in residence on the Davis campus. Not more than 18 of these 35 quarter units may be completed in summer session courses at UC Davis.

Scholarship Requirement
Students in the College are required to attain a minimum grade point average of 2.0 for all courses specified as depth subject matter in their major. Only grades earned in courses taken at UC Davis are included in the grade point calculation. Each candidate must complete a program of study either as prescribed in (a) a major approved by the Undergraduate Majors and Courses Subcommittee and printed in this catalog, or (b)
an individual major approved by the Individual Major Sub-committee.

**English Composition Requirement**

The English Composition requirement can be met in one of two ways:

1. Either two courses emphasizing written expression or one course emphasizing written expression and one course emphasizing oral expression, with a grade of C- (or P) or better. The following UC Davis courses satisfy this requirement:
   - (a) one course must be selected from English 1, 3, 18, 19, 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E, or 104F (courses with primary emphasis in writing skills);
   - (b) one course selected from the courses not selected above, or from Communication 1, Comparative Literature 1, 2, 3, 4, or Native American Studies 5 (courses emphasizing either writing or speaking skills);

   **OR**

2. By passing the English Composition Examination administered by the College of Letters and Science upon completion of 70 units of degree credit (the examination does not yield credit).

**English Composition Examination.** The no-fee examination is typically offered on Saturday mornings in mid-October, late January and late April. See the Class Schedule and Registration Guide for specific dates.

There are no examinations given during the summer. Sign-up rosters will be posted on the bulletin board near the main English Department office (114 Voorhies), Monday until Friday at noon (or until they are filled) just preceding each Saturday examination date. You must sign up, in person, by noon Friday. The English Composition Examination form, available at the UC Davis Bookstore, is required.

**General Education**

You should consult your Dean’s Office or department adviser in advance to determine exactly how your General Education courses will apply toward your major.

You may, for good cause, request a modification of particular degree requirements by submitting a student petition. These petitions, which are available in the Undergraduate Office, can be a valuable aid in resolving individual program conflicts or other special problems. Such petitions are subject to approval by the Student Relations Committee, a body of seven professors and seven (non-voting) students. A negative decision by

**Degree Requirement Changes**

On occasion, the faculty make changes in the requirements that students must satisfy to obtain the baccalaureate degree. So that you will not be penalized by changes that may work to your disadvantage and so that you will benefit by changes that assist you in completing your degree requirements, it is college policy that you may choose to fulfill the university, college, and major requirements in effect at the time you were registered at UC Davis. If you have transferred to UC Davis from a community college, state college, or another university, you may follow the requirements as stated in any UC Davis catalog in effect either during the three years immediately preceding your transfer to Davis or at the time you first registered at that institution, whichever is most recent. Once you have chosen the year of the General Catalog under which you wish to be governed, you must satisfy all of the university, college, and major requirements specified in that catalog.

**College of Engineering**

**Unit Requirements**

Each candidate for the degree of Bachelor of Science in Engineering must satisfactorily complete an approved curriculum in engineering. Each curriculum consists of a specified Lower Division Program (or an approved equivalent program for students who transfer into the College with 90 or more quarter units) and a specified Upper Division Program. No unit of coursework you complete may be used to satisfy two different degree requirements (except where the catalog specifically indicates otherwise). Detailed requirements for the approved curricula are given in the “Programs and Courses” section of this catalog; to see the courses required in your major, consult this section. The minimum number of required units in the combined Lower and Upper Division Programs varies, with the curriculum, from 180 to 195. You are responsible for planning your program and satisfactorily completing all degree requirements.

You may be denied registration for future quarters if you do not comply with this regulation. However, filing this study plan does not preclude a change of major or program modifications.
the committee may be appealed to the Executive Committee of the College for action at a regular meeting.

**Transfer students.** To be eligible for transfer, you must have at least 90 transferable quarter units, which must include two acceptable courses in university level composition. You will be classified as having upper division status, but you will be required to complete the lower division requirements for your major before your lower division is considered complete. You may, however, start your upper division program while completing your lower division requirements provided you meet all prerequisites for the upper-division courses.

All engineering majors are impacted. For your application for transfer to be considered, you need to have completed a substantial proportion of your lower-division requirements.

For more specific advice on your requirements, see the transfer counselor at your institution, consult Project Assist (available at community college transfer centers) or consult with the advisers in the Engineering dean's office (530-752-0553).

**Credit in UC Davis Extension Courses.** Appropriate courses taken through UC Davis Extension may be used for degree credit; however, you may use a maximum of 16 units of courses taken through UC Davis Extension for degree credit. Simultaneous registration in resident courses and Extension courses requires prior approval by the College's Associate Dean for Undergraduate Studies. Such approval will be given only for a limited number of credits.

**Residence Requirement**

In addition to fulfilling the university residence requirement, you must complete at least 35 of the final 45 units characteristic of your curriculum in engineering while registered in the College.

**Scholarship Requirement**

In addition to meeting the university scholarship requirement, you are required to maintain a 2.0 grade point average for all course work within Engineering.

**English Composition Requirement (Upper Division)**

After completing 70 quarter units, you may elect to satisfy the upper division English Composition requirement by passing the English Composition Examination administered by the College of Letters and Science. (You should take it early in your junior year and must take it before your last quarter. Units of credit are not given for passing this examination.)

The English Composition Examination is typically offered on Saturday mornings in mid-October, late January and late April. See the *Class Schedule and Registration Guide* for specific dates. Sign-up rosters will be posted on the bulletin board near the main English Department office (114 Voorhies), Monday until Friday at noon (or until they are filled) just preceding each Saturday examination date. You must sign up, in person, by noon on Friday. You must obtain the English Composition Examination form, available at the UC Davis Bookstore, to take the exam.

Or, upon completion of 90 quarter units, you may satisfy this requirement by completing English 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, or 104E with a grade of C– or higher. Students in Computer Science Engineering must complete the upper division composition requirement by taking English 101 or by passing the English composition requirement. Students in Optical Science and Engineering must complete the upper division composition requirement by taking English 101, 102, 104A, 104B, 104C or 104E.

This requirement is in addition to the expository writing course requirement (English 1 or 3; Comparative Literature 1, 2, 3 or 4; or Native American Studies 5) specified in the Lower Division Programs.

**Engineering Design Requirement**

Engineering design is the process of devising a system, component, or process to meet certain needs. Design involves a decision-making process (often iterative), in which the basic sciences, mathematics and engineering sciences are applied to convert resources optimally to meet a stated objective. Among the fundamental elements of the design process are the establishment of objectives and criteria, synthesis, analysis, construction, testing and evaluation. You must take an appropriate amount of such design course work through a combination of required and restricted elective courses. Specific comments about design are included in individual curricula descriptions. You should also review the design content of your individual program with your adviser in the course of completing the upper division advising worksheet.

**Electives**

In general, there are three kinds of elective courses in the engineering curricula: General Education, technical, and unrestricted. Some transfer students have an additional set of electives: Physical and Biological Sciences electives.

**General Education Electives.** Because, as an engineer, you will be a significant participant in the human setting, you will need to have a breadth of education that will allow you to deal with contemporary social issues and to understand the impact of engineering solutions on the global and societal context. To these ends, you will need to take a minimum of 24 units (33 units for Computer Science and Engineering majors) of General Education electives. In addition, to ensure that your GE program has a degree of depth and coherence, at least two of the courses that you take for your GE topical breadth requirement must be upper division courses (courses numbered 100 or above).

Since all engineering majors are in the Science and Engineering GE topical breadth area, you will fulfill the campus GE requirement by taking courses in the Arts and Humanities and the Social Sciences areas.

In satisfying the GE requirement, note that (a) you must take GE courses for a letter grade, and (b) you must satisfy the Subject A requirement before you can receive GE writing experience credit for any course. In consultation with your academic adviser, you should attempt to design a coherent approach to contemporary issues by using your GE electives.

The list of Arts and Humanities and Social Sciences electives appears at the end of this catalog. Note that you may not take the following courses for GE credit if you are a College of Engineering student:

- Agricultural Education 100, 160, 172
- Animal Science 141, 148
Applied Science 137
Civil and Environmental Engineering 165
Engineering 160
Entomology 158
Environmental and Resource Sciences 10
Fiber and Polymer Science 110
Food Science and Technology 10
Geology 115N
Physics 137, 160
Plant Biology 141
Political Science 192A, 192B
Statistics 10
Viticulture and Enology 3

**Technical electives** permit you to tailor a program to your own academic and career objectives. For some, the technical electives offer the opportunity to prepare for a specific occupation. For others, they offer an opportunity to broaden a background in the sciences and engineering.

You may receive technical elective credit to a maximum of 6 units for any combination of engineering courses numbered 190C, 192, 197, 198 and 199, unless further restrictions are imposed on your major. Academic credit for 199 courses is limited to a maximum of 5 units per quarter for each substantially different project. Academic credit for engineering internship courses (192s) is also limited to a maximum of 5 units per quarter.

With the exception of the following courses, all upper division courses in engineering, physics, chemistry, mathematics and statistics may be taken as technical electives. The courses which may not be used are:

- Applied Science Engineering 137
  - (restricted to one unit of technical elective)
- Physics 137 and 160 (restricted to one unit of technical elective), 194HA, 194HB, 195, 197T, 198, 199
- Chemistry 194HA, 194HB, 194HC, 197, 198, 199
- Engineering 160 (restricted to one unit of technical elective)
  - Mathematics 190, 192, 194, 197TC, 198, 199
- Statistics 102

In addition to upper division engineering, physics, chemistry, mathematics and statistics courses, the following courses may be taken as technical electives:

- Agricultural Management and Rangeland Resources, any upper division course except 101 and 190 through 199
- Anatomy, Physiology, and Cell Biology 100
- Animal Biology 102, 103
- Animal Genetics 101, 105, 107, 108, 109, 111
- Animal Science 104, 105
- Applied Biological Systems Technology 110L, 161, 163, 165, 170, 175, 180, 181, 182
- Atmospheric Science 110, 111, 115, 116, 120, 121A, 121B, 124, 128, 133, 149, 150, 158, 160
- Biological Sciences 1A, 1B, 1C, 101, 102, 103, 104, 120, 120P, 122, 122P
- Chemistry 2B, 2BH, 2C, 2CH, 8A, 8B
  - (if not used for your major requirement)
- Economics 140

Environmental and Resource Sciences 100, 100L, 105, 131, 136, 144, 173, 185, 186, 187
Environmental Horticulture 100, 102, 105, 120, 125, 130, 133, 144, 145, 149, 150, 160
Environmental Science and Policy 100, 110, 121, 123, 124, 126, 150A, 150B, 150C, 151, 151L, 155, 155L, 163, 167, 168A, 168B, 173, 179
Environmental Toxicology 101, 112A, 112B, 114A, 114B, 128, 131, 135, 146
Fiber and Polymer Science 100, 150, 161, 161L
Hydrologic Science 103, 110, 115, 117, 122, 122L, 124, 134, 141, 142, 143, 144, 146, 151A, 151B, 182
Management 11A, 11B
Microbiology 102, 102L, 105, 110, 120, 120L, 140, 150, 155L, 160, 162
Molecular and Cellular Biology 120L, 121, 122, 123, 126, 140L, 141, 142, 150, 150L, 160L, 161, 162, 163, 164
Neurobiology, Physiology, and Behavior 100–169
Plant Pathology 120, 123, 130, 148, 150
Soil Science 100, 102, 105, 107, 109, 111, 112, 118, 120
Wildlife, Fish, and Conservation Biology 100, 102, 102L, 110, 110L, 111, 111L, 120, 120L, 121, 122, 123, 130, 131, 136, 140, 141, 151, 152, 153, 154, 156, 157

You are urged to discuss the selection of technical elective courses with your academic adviser.

**Unrestricted electives.** If your curriculum allows for unrestricted electives, you may count any course for which university credit is allowed as an unrestricted elective in the engineering curricula.

**Physical and Biological Science electives.** Engineering students are required to have 29 units in sciences, typically 10 units of chemistry and 19 units of physics. If you transfer into the College of Engineering with advanced standing, you are required to complete 26 units of physical and biological science by graduation, but you need to have completed only 5-10 units of chemistry (depending on major) and 15 units of physics by the time you transfer. You may make up the remaining 4 units by taking 4 additional units of chemistry, 4 additional units of physics, or 4 units in courses selected from any of the curricula listed below, with the restrictions that follow.

- Atmospheric Science
- Biological Science
- Chemistry
- Evolution and Ecology
- Geology
- Microbiology
- Molecular and Cellular Biology
Neurobiology, Physiology, and Behavior
Physics
Plant Biology

All courses in these departments numbered 10 and 190–199 are excluded for credit, as are the following courses:
Evolution and Ecology 138
Geology 1, 3-3G-3L, 4, 116-116G, 135
Physics 137, 160
Plant Biology 1, 11, 12

Degree Check

Use the Degree Requirement Check sheets for each of the curricula for monitoring your progress toward a degree. The Undergraduate Office will prepare only one unofficial preliminary degree check for you (preferably at the end of your junior year). You should also file for a follow-up degree check the quarter before you plan to graduate. You will be offered the opportunity to have an exit interview degree check during your last quarter before graduation upon your filing for candidacy. The office will contact you to schedule an appointment. You can get further information concerning these services and the forms for requesting a degree check, a follow-up degree check or an exit interview in the Undergraduate Advising Office.

Degree Requirement Changes

Since engineering is a rapidly developing profession, curricular changes are made by the faculty from year to year. To ensure that you benefit from these changes, the College of Engineering has established a policy that you must fulfill the degree requirements stated in the College of Engineering Bulletin for the year in which you complete degree work or in the Bulletin for the year immediately preceding.

College of Letters and Science

Unit Requirements

A minimum of 180 units is required for the bachelor’s degree. Of these units, 64 must be earned in upper division courses.

Registration Beyond the 225-unit Limit. You are normally expected to fulfill all degree requirements within the 180- to 225-unit range. Once 225 units have been completed (excluding units awarded for College Board Advanced Placement Examinations), you may register only with the permission of the dean. Such permission is rarely granted, and then typically only to allow completion of minimum degree requirements. You will be expected to adhere to a program of courses agreed upon and to meet other conditions that may have been set. Approval must be obtained before you will be permitted to register for courses for the quarter following completion of 225 or more units.

If you are in good standing, you will be able to complete 12 quarters or the equivalent (e.g., four years) of college work even if you have earned more than 225 units before you finish your fourth year. You must petition for continuation, however, and file the quarter-by-quarter course program you have planned.

Unit Credit Limitations

For certain courses, limits have been established on the number of units that can be counted towards the 180-unit minimum required for the degree. To avoid discovering just before graduation that you are short units, keep track of the number of units you have taken in each of the following categories.

Limitation on Credit for Graduate and Professional Courses. Undergraduates may enroll in graduate and professional courses in the 200, 300 and 400 series subject to the restrictions described in the Academic Information section in this catalog. Graduate and professional courses that have been completed will be listed on the student's transcript in the usual manner. However, the units earned may be counted toward degree requirements only under the conditions listed below.

Within the limitations A, B and C given below, undergraduate students in the College may count an unlimited number of units in graduate 200 series courses and up to a combined total of 9 units in 300 and 400 series professional courses toward degree requirements. These units, however, are not counted as upper division units unless this is granted by petition to the dean.

A. The recommendations of the instructor in the course and the department chairperson—in addition to approval from the dean—must be obtained in order to receive credit toward the degree for the following kinds of courses:

• all graduate courses 200–298, whether offered by a department or program outside of or within the College of Letters and Science
• all professional courses 300–398 for teachers offered outside of the College of Letters and Science
• all postgraduate professional courses 400–498 offered outside of the College of Letters and Science
• all variable unit courses 300–398 and 400–498 offered within the College of Letters and Science

B. The minimum eligibility conditions for an undergraduate student in the College to petition for degree credit for a 200, 300, or 400 series course are a UC grade point average of 3.3 and completion of 18 upper division units basic to the subject matter of the course. These eligibility conditions may be waived, however, upon the recommendation of the course instructor and concurrence of the department chairperson if the student's preparation warrants exception.

C. Undergraduates in the College cannot receive degree credit for special study courses 299, 399, or 499.

Limitation on Credit for Units Graded P. Excluding courses that are graded on a Passed/Not Passed (P/NoP) basis only, the number of units graded P that may be accepted towards a degree in the College of Letters and Science is limited to not more than one fourth of the units completed in residence on the Davis campus.

The Academic Senate limits the total number of courses graded P, including units earned in courses graded “P/NoP only,” to one third of the units completed on the Davis campus. This limitation applies to all Davis undergraduates, including Letters and Science students.

Limitation on Credit for University Extension Courses. Students may apply credit earned through UC Davis Extension courses towards the 180-unit requirement only with written approval from the dean prior to registration. The degree credit allowed by the dean for UC Davis Extension courses with des-
ignators other than “XD” or “XDC” is usually less than the unit value listed in the course description. Additional limitations on UC Davis Extension courses include: a maximum of 9 units may be offered for elective credit only and may not be applied toward fulfillment of the Area, Foreign Language, Upper Division, or Residence requirements of the College. Beginning in Fall 2003, grade points earned when enrolled in Open Campus (concurrent) courses through UC Davis Extension will count toward the calculation of a student’s UC GPA upon his/her admission or readmission to regular student status at UC Davis.

**Other Unit Credit Limitations.** The following are additional courses that have limits on the number of units that can be counted toward your degree.

**Internship courses (numbers 92, 192):** 12 units maximum including internship units taken at other institutions. (See under Nonstandard courses below.)

**Nonstandard courses (92, 97T, 97TC, 99, 192, 194H, 197T, 197TC, 199 and similar courses):** 30 units maximum or one-sixth of the units taken at UC Davis, whichever is the smaller. (Note the separate unit limits on internship, special study and tutoring courses; and major limitations.)

**Physical Education 1 and 6 (combined):** 6 units maximum.

**Special Study courses (99, 194H, 199):** 5 units maximum in any one quarter. (See under Nonstandard courses above.)

**Tutoring courses (97T, 97TC, 197T, 197TC):** 10 units maximum. (See under Nonstandard courses above.)

**Residence Requirement**

While registered in the College of Letters and Science, a minimum of 27 upper division units, including 18 upper division units in the major, must be completed on the Davis campus. (Work completed while registered in the UC Education Abroad Program or the UC Davis Extension Open Campus Program does not satisfy campus or College Residence requirements.)

**Scholarship Requirement**

The minimum grade point average to satisfy the scholarship requirement is 2.0 for all courses counted toward the major and for all upper division courses used to satisfy major requirements. Only grades earned in courses taken at UC Davis will be included in the grade point computations. To obtain these minimum averages in the major, you may repeat courses that are graded D or F. If you have to repeat a course more than once, you need the dean’s approval.

**English Composition Requirement**

The English Composition requirement can be met in one of two ways:

1. by passing the English Composition Examination upon completion of 70 units of degree credit (the examination does not yield credit);

**OR**

2. by completing with a grade of C– (or P) or better
   (a) one course from English 1, 3, 18, 19, Comparative Literature 1, 2, 3, 4, or Native American Studies 5; and (b) English 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E, or 104F (which must be taken after 84 units have been completed).

**Transfer Courses in English Composition.** Transfer courses considered by the dean to be equivalent or comparable to English 1, 3, 18, 19, 101, 104A, 104B, 104C, 104D, 104E, 104F, Comparative Literature 1, 2, 3, 4, or Native American Studies 5 will be accepted toward satisfaction of the English Composition requirement. Note that English 101 and 104A, 104B, 104C, 104D, 104E, and 104F or the equivalent must be taken after you have completed 84 units of transferable degree credit.

If your transfer work does not include an acceptable English composition course taken after you had completed or accumulated 84 units, you may fulfill the requirement by examination (see below) or take English 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E, or 104F at UC Davis.

**English Composition Examination.** The no-fee examination is typically offered on Saturday mornings in mid-October, late January and late April. See the Class Schedule and Registration Guide for specific dates.

There are no examinations given during the summer. Sign-up rosters will be posted on the bulletin board near the main English Department office (114 Voorhies), Monday until Friday at noon (or until they are filled) just preceding each Saturday examination date. You must sign up, in person, by noon Friday. The English Composition Examination form, available at the UC Davis Bookstore, is required. It is recommended that students with disabilities contact the Student Disability Center (752-3184) and the Subject Office (752-0450) at least two weeks prior to the exam date to arrange accommodations.

**Area (Breadth) Requirement**

The College Breadth Requirement promotes the intellectual growth of students by asking them to acquire a broader background of knowledge than is provided by the usual major. The Breadth requirement also guides students in exploring the interdependence of knowledge and, in the case of the A.B. degree, provides students the opportunity to become acquainted with performance in the fine arts.

**A.B. degree—satisfaction of the campus General Education requirement plus completion of one of the following options:**

**OR**

1. a “Mini Minor” consisting of a minimum of three approved upper division courses in a single Letters and Science department or program other than the major (and which are not offered in satisfaction of major requirements);

2. a minimum of three approved lower or upper division courses in Art, Music, or Dramatic Art from outside the student’s major;

**OR**

1. a certified minor from any UC Davis college or program.

The Letters and Science faculty believes that the completion of a certified minor is often the best way for a student to obtain structure and coherence in pursuit of intellectual breadth.

For the purposes of options a and b above, all courses are considered as approved except: courses bearing less than 3 units
of credit, internship courses, non-standard courses, directed group study courses, and courses used to satisfy the College English Composition Requirement.

B.S. degree—a total of 90 units in natural sciences/mathematics; and satisfaction of the General Education requirement.

Courses numbered 92, 97T, 97TC, 98, 192, 197T, 197TC, 198, and from 200 through 499 cannot be counted toward satisfaction of the natural sciences/mathematics Area requirement. A maximum of 10 units in special study courses (99, 194H, 199) may be counted toward that portion of the Area requirement. Courses used to satisfy the English Composition and Foreign Language requirements may not be counted toward the Area requirement. Subject to the restrictions just listed, courses acceptable for fulfilling the 90-unit natural sciences/mathematics Area requirement are:

**Natural Sciences and Mathematics**

Anatomy, Physiology and Cell Biology 100
Anthropology 1, 5, 15, 15V, 151, 152, 153, 154A, 154B, 155, 156, 157, 158
Astronomy
Avian Sciences 13
Biological Sciences
Cell Biology and Human Anatomy 101, 101L
Chemistry
Engineering 5, 6, 10, 35, 102
Engineering: Electrical and Computer 70, 170
Entomology 10, 100, 153
Environmental and Resource Sciences 131
Environmental Science and Policy 30, 100, 121, 126
Environmental Toxicology 101
Evolution and Ecology
Exercise Biology 101, 103, 110, 111, 112, 113, 115, 116, 117, 126, 133, 135
Fiber and Polymer Science 110
Food Science and Technology 100A, 100B, 101A, 101B
Geography 1
Geology
Integrated Studies 8A
Mathematics
Microbiology
Molecular and Cellular Biology
Neurobiology, Physiology, and Behavior
Nutrition 10, 101, 111
Pathology, Microbiology and Immunology 126
Physics
Plant Biology
Psychology 41, 100, 101, 103A, 103B, 104, 113, 121, 122, 123, 124, 126, 127, 128, 129, 130, 131, 135, 146, 180B
Statistics
Wildlife, Fish, and Conservation Biology 10

**Foreign Language Requirement (A.B. and B.A.S. degrees)**

The Foreign Language requirement may be satisfied in any language offered at UC Davis, or for which transfer credit is allowed from another academic institution (including American Sign Language).

You may also satisfy this requirement by examination in a language not offered on the Davis campus. In this case, the Dean's Office will assist you in making arrangements to take an examination on another University of California campus, with a faculty member who teaches the language in question.

**Satisfaction of the Requirement.** Plan to complete the Foreign Language Requirement by the end of your first or second year, as program priorities permit. This is particularly important if you plan to apply for the university's Education Abroad Program. The Foreign Language requirement may be satisfied by examination or completion of language courses as follows:

1. *Foreign Language Placement Test.* This test does not yield unit credit—it only determines whether the Foreign Language requirement has been met, or at which point in the language sequence you should enroll.

   You may validate your knowledge of a language learned in high school by taking this test. A test may not be taken, however, in a language for which you have already received degree credit. If you are a transfer student, consult your Graduation Requirement Degree Check, which is issued by the Dean's Office within a quarter after enrollment.

2. *College Board SAT II: Subject Test.* Earning a qualifying score of at least 550 on a College Board Foreign Language Subject Test satisfies the requirement. This test may be taken at any time during your high school career. Once your score is on file at Undergraduate Admissions and Outreach Services, notify the Letters and Science Dean's Office so that satisfaction of the College requirement can be noted on your record.

3. *College Board Advanced Placement Examination.* A score of 5, 4, or 3 on any foreign language College Board Advanced Placement Examination, with the exception of Latin, taken in high school will satisfy the Foreign Language requirement.

4. *Course Completion in College (or the equivalent).* A.B. and B.A.S. degrees—equivalent of 15-unit level of proficiency in one language at UC Davis (e.g., Spanish 3 or Japanese 3). B.S degree—none, but as is required in the major program.

   If you have successfully completed the second or third year of a language in the tenth or higher grade in high school you may receive unit credit for course 1 of that language when taken at UC Davis, but the grading mode will be P/NP only. Although a Passed or Not Passed grade will be charged to your P/NP option, no petition is required. [See “Passed/Not Passed (P/NP) Grading” in the “Academic Information” chapter.]

5. *Proficiency Examination.* If you have not completed the required level language course, but assume you have attained equivalent knowledge, you may satisfy the language requirement by passing a proficiency examination. For more information, consult the appropriate foreign language department.
Major Program Requirements

Requirements for major programs are described in the Programs and Courses section of this catalog. These requirements are fulfilled by completing a major program offered by a teaching department or program committee in the College of Letters and Science (see the list of majors) or an individual major program approved by the College’s Committee on Individual Majors.

No more than 6 units in internship courses (numbered 92, 192, or similar internship courses) may be accepted in satisfaction of the requirements of major programs. Courses numbered 97T, 97TC, 197T and 197TC do not satisfy unit or course requirements in the major.

Degree Check

Before the beginning of your senior year, take some time to consider your goals and to plan the academic program for your final year as an undergraduate. To plan properly and to ensure that you get the most out of your remaining education and complete all graduation requirements as well, you should know what requirements remain unsatisfied. To help you in these efforts, the Undergraduate Education and Advising Office provides on its Web site (http://www.ls.ucdavis.edu/students) informational materials and instructions on how to evaluate your progress on college and university requirements. Many departments provide similar information regarding your major requirements.

Once you have completed 135 units of degree credit, you should contact your faculty adviser for a check of your major requirements. At approximately this point, the Undergraduate Education and Advising Office will provide each student with one official degree check summarizing your progress in fulfilling college and university requirements.

Degree Requirement Changes

On occasion, the faculty makes changes in the requirements that students must satisfy to obtain the baccalaureate degree. So that you will not be penalized by changes that may work to your disadvantage and so that you will benefit by changes that assist you in completing your degree requirements, it is College policy that you may choose to fulfill the university and College requirements (see General Education requirement for an exception) as stated in any UC Davis General Catalog in effect at any time you were registered in a postsecondary institution of higher education (i.e., community college, college, or university). Once you have chosen the year of the General Catalog under which you wish to be governed, you must satisfy all of the university and college requirements specified in that catalog.

With respect to the completion of your major requirements, most of the majors in the College of Letters and Science require completion of the major degree requirements in effect at the time you officially declared your major. However, because departments differ in how they handle these matters, check with the department or major program office if you have any questions about which requirements apply to you.