

CHEMISTRY AND BIOCHEMISTRY

PREPARATION FOR THE MAJOR

High School Preparation

Recommended as part of or in addition to UC's "a-g" admission requirements:

Four years of English
Four years of mathematics
Chemistry; Physics

Transfer Preparation*

To make normal progress in the major, complete the following courses prior to transfer:

One year sequence of general chemistry with laboratory
One year sequence in organic chemistry with laboratory
One year sequence of calculus
Linear algebra, differential equations

Specific requirements for each degree:

BA in Chemistry requires:

One year sequence of general physics with laboratory

BS in Chemistry requires:

Multivariable calculus
One year sequence of physics for science majors, with laboratory

BS in Biochemistry requires:

Multivariable calculus
One year sequence of general physics with laboratory
Two terms of general biology with laboratory

*Transfer students planning to attend as a Chemistry or Biochemistry major and who have taken Chemistry courses at institutions other than UCSB should contact the Undergraduate Advisor (805) 893-2931 for information on clearing prerequisite blocks for registration.

Please see the UCSB *General Catalog* (www.catalog.ucsb.edu) or your school counselor for more information on course preparation. California community college students should see www.assist.org.

Chemistry is the study of molecules, their formation from atoms, and their transformation into new molecules. Chemistry seeks to understand and control the reactions that cause these transformations. Chemistry's breadth results from the diversity of molecules, which range from the simple two- to three-atom molecules of the earth's atmosphere to the incredibly complex molecules and molecular structures of living things.

The Department

UCSB's Department of Chemistry and Biochemistry has divisions of organic, inorganic/analytical, physical, biological chemistry, and materials. Over 2,000 undergraduate students complete chemistry courses each year, as do over 100 graduate students and approximately 50 postdoctoral students and visiting scholars. Many of the department's 35 faculty members have won national as well as international awards.

The Department of Chemistry and Biochemistry conducts studies in an exceptionally wide range of areas including:

- The electronically excited states of atoms and molecules;
- Ion structure and reactivity;
- The synthesis of new organic molecules with medicinal properties;
- Theoretical descriptions of atoms and molecules in the solid, liquid, and gas phases;
- Light-induced chemical reactions;
- The synthesis and characterization of novel materials;
- The chemistry of neurological processes;
- Proteins and protein assemblages of cellular processes;
- The mechanisms by which molecules undergo chemical change in organic, inorganic, and biological systems;
- Polymer synthesis and characterization;
- Conformation and energetics of polypeptides and DNA/RNA oligonucleotides.

The department's excellent facilities, personal contact between highly motivated students and faculty, undergraduate research opportunities, and a relaxed yet demanding learning environment combine to make UCSB an attractive choice for the serious student of chemistry.

The Major

Students who like to invent and enjoy thinking in quantitative and mathematical terms may be interested in chemistry. Likewise, students who can break complex questions into a series of less complicated questions that can be answered through experimentation should consider the chemical sciences. The Department of Chemistry and Biochemistry offers the Bachelor of Arts (BA) and the Bachelor of Science (BS) degrees in Chemistry and the Bachelor of Science (BS) degree in Biochemistry. The BA's requirements are somewhat less restrictive than those of the BS. The BA is a good choice for students interested in medical, dental, law, or business school. Students interested in graduate work in chemistry or biochemistry may pursue any of the three degrees.

A two-year core curriculum in chemistry, mathematics, and physics lays a solid foundation for the required and elective coursework of the upper division major. These upper division courses, which add breadth and specialization to the program, have low enrollments that enable students to work closely with faculty members of their choice. Undergraduate students are encouraged to undertake independent study and research projects as soon as they acquire the basic laboratory skills and background to benefit from such experiences. Many join departmental research groups during their junior and senior years. All Chemistry and Biochemistry majors are assigned an advisor with whom they consult regarding selection and substitution of coursework and other matters pertaining to their academic careers.

Careers in Chemistry

The chemical/pharmaceutical industry is the largest science-based industry in the United States. Current predictions indicate that job opportunities for chemists will continue to be strong in the decades ahead. In our increasingly technological society, excellent careers await the chemistry major not only in the sciences, but also in managerial and administrative positions in government and private industry. Firms employing chemistry majors include those in paper and textile production, pharmaceuticals and medical supplies, bioengineering, materials, the petroleum industry, the chemical production industry, the food and beverage processing industry, and the photographic industry.

UCSB's Chemistry and Biochemistry majors prepare students for careers in industrial and environmental law, and other environmental fields such as resource management, soil conservation, and water purification. The major also prepares students for careers in medicine. Students may take advantage of the campus' outstanding health sciences advisory system which advises and supports students from the beginning of their studies up to their entrance into health sciences graduate programs and professional schools.

Students interested in teaching chemistry and conducting research at a university should plan to complete the Ph.D. degree. Students interested in teaching at a community college should pursue graduate work at least through the master's degree. Teaching at the high school (secondary) level requires the California Single Subject Teaching Credential. Students considering this last option should discuss their plans with the credential advisor in UCSB's Graduate School of Education early in their academic careers.

For more information about UCSB's Chemistry and Biochemistry majors, please call or write to:

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805/893-2931
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