Chemical and Biomolecular Engineering

College of Chemistry (http://chemistry.berkeley.edu)
Department Office: 201 Gilman Hall, (510) 642-2291

Chair: Jeffrey A. Reimer, PhD
Department Website: Chemical and Biomolecular Engineering (http://cheme.berkeley.edu)

Chemical Engineering Major

The College of Chemistry offers a major in chemical engineering leading to the BS degree. The program equips the student for professional work in development, design, and operation of chemical processes and of process equipment. Students with high scholastic attainment are well prepared to enter graduate programs. The curriculum is accredited by the Accreditation Board for Engineering and Technology.

Degree Requirements

1. A total of 120 semester units
2. Mathematics 1A, 1B, 53, 54
3. Physics 7A, 7B
4. Chemistry 4A, 4B, 112A, 120A or Physics 137A
5. Chemical Engineering 140, 141, 142, 150A, 150B, 154, 160, 162
6. Engineering 7, 45
7. Electrical Engineering 40
8. Biology 1A
9. An engineering elective

Additional technical courses are required to complete either the open elective program or one of the concentrations within the chemical engineering program. Students must satisfy the Entry-level Writing, the American History and Institutions, and the American Cultures Breadth requirements. Nineteen units in reading and composition, humanities, and social sciences are required to fulfill the breadth requirement.

For further information on degree requirements, please see the department website (http://chemistry.berkeley.edu/student_info/undergrad_info/degree_programs/cheme_major) .

Undergraduate Research

Students are encouraged to participate in individual undergraduate research in collaboration with one of the faculty during their junior or senior year.

Joint Major Programs with the College of Engineering

Two joint major programs involving the Colleges of Engineering and Chemistry are offered:

- Chemical Engineering/Materials Science and Engineering
- Chemical Engineering/Nuclear Engineering

These joint majors include the core courses in both departments. Details on the course requirements can be found on the College of Chemistry web site (http://chemistry.berkeley.edu/student_info/undergrad_info/degree_programs/cheme_major/joint_major_programs.php) and in the *College of Engineering Announcement: A Guide to Undergraduate and Graduate Study* .

Intercollegiate Transfers

Transfer applicants are expected to complete, at a minimum, courses equivalent to Chemistry 1A/L-1B, Mathematics 1A-1B, Physics 7A (calculus-based mechanics and wave motion), English R1A, and two additional courses toward the major before transfer. Additional chemistry, mathematics, calculus-based physics, engineering, computer programming using MATLAB, and some biology is encouraged.

Coursework taken the summer before enrollment at Berkeley is not considered in the selection of applicants.

Chemical Engineering Minor

A minor in chemical engineering will be awarded to students who have successfully completed five upper division chemical engineering courses as follows: 140, 141, and 150A plus any two courses selected from 142, 150B, 162, 170A, 170B, 171, 176, C178, or 179. Students who have completed courses in other departments at Berkeley that are essentially equivalent to 141 and 150A can substitute other courses from the above list. At least three of the five courses taken for the minor must be taken at Berkeley. All courses taken for the minor must be taken for a letter grade. Students must achieve at least a 2.0 GPA in the courses taken for the minor for both of the following: (1) courses taken at Berkeley and (2) courses taken at another institution and accepted by the College of Chemistry as equivalent to courses at Berkeley. For the minor to be awarded, students must submit a notification of completion of the minor to the College of Chemistry Undergraduate Advising Office.

Note: Consult with your college or school for information on rules regarding overlap of courses between majors and minors.

Graduate Programs

Students interested in graduate study are invited to visit the department's website (http://cheme.berkeley.edu/grad_info) for more information.

CHM ENG 24 Freshman Seminars 1 Unit
Department: Chemical & Biomolecular Engineering
Course level: Undergraduate
Term course may be offered: Spring
Grading: The grading option will be decided by the instructor when the class is offered.
Hours and format: 1 hour of Seminar per week for 15 weeks.
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

CHM ENG 40 Introduction to Chemical Engineering Design 2 Units
Department: Chemical & Biomolecular Engineering
Course level: Undergraduate
Term course may be offered: Fall
Grading: Letter grade.
Hours and format: 1 hours of lecture and 1 hour of discussion per week.
Prerequisites: Mathematics 1A, which may be taken concurrently.
Design and analysis of processes involving chemical change. Strategies for design, such as creative thinking and (re)definition of the design goal. Methods for analyzing designs, such as mathematical modeling, empirical analysis by graphics, and dynamic scaling by dimensional analysis. Design choices in light of process efficiency, product quality, economics, safety, and environmental issues.

CHM ENG 84 Sophomore Seminar 1 or 2 Units
Department: Chemical & Biomolecular Engineering
Course level: Undergraduate
Terms course may be offered: Fall, spring and summer
Grading: The grading option will be decided by the instructor when the class is offered.
Hours and format: 1 hour of seminar per week per unit for 15 weeks. 1 and 1 half hours of seminar per week per unit for 10 weeks. 2 hours of seminar per week per unit for 8 weeks. 3 hours of seminar per week per unit for 5 weeks.
Prerequisites: At discretion of instructor.
Sophomore seminars are small interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores.
Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

CHM ENG 90 Science and Engineering of Sustainable Energy 3 Units
Department: Chemical & Biomolecular Engineering
Course level: Undergraduate
Term course may be offered: Spring
Grading: Letter grade.
Hours and format: 2 hours of Lecture and 1 hour of Discussion per week for 15 weeks.
Prerequisites: Chemistry 1A or 4A.
An introduction is given to the science and technologies of producing electricity and transportation fuels from renewable energy resources (biomass, geothermal, solar, wind, and wave). Students will be introduced to quantitative calculations and comparisions of energy technologies together with the economic and political factors affecting the transition from nonrenewable to sustainable energy resources. Mass and energy balances are used to analyze the conversion of energy resources.
Instructors: Bell, Segalman

CHM ENG 98 Directed Group Studies for Lower Division