Engineering

College of Engineering (<u>http://</u> <u>coe.berkeley.edu</u>) Office of the Dean: 320 McLaughlin Hall #1700, (510) 642-5771

Dean: S. Shankar Sastry, PhD College Website: Engineering (<u>http://</u> coe.berkeley.edu)

Overview

The Engineering—Undeclared Program is for students who are interested in pursuing an engineering education but are undecided on a particular major within the college.

Students admitted to the program enjoy the benefit of a team comprised of an adviser who works with undeclared students and faculty from each major. Together they help students in the program explore their academic interests, understand and complete requirements and select a major. The common first year engineering curriculum is supplemented with introductory seminars and courses, such as Engineering 92, BioEng 24 and various major courses and/or Freshman Seminars, which are intended to generate enthusiasm for and develop a better understanding of the different engineering fields.

Students admitted into the program must declare a major by the end of their fourth semester, and if in good academic standing, may choose from any of the College of Engineering majors. For detailed information on these majors, see the corresponding sections of this Bulletin and the College of Engineering Undergraduate Guide available online. (http:// coe.berkeley.edu/guide)

Admission to Engineering—Undeclared

Freshman applicants interested in applying to the Engineering— Undeclared Program should follow the procedures outlined in the Undergraduate Education (<u>http://bulletin.berkeley.edu/archive/2013-14/</u> <u>undergraduateeducation</u>) section of this Bulletin. Junior transfer applicants may not apply to the program.

Historically, the Engineering—Undeclared Program admits from the strongest applicants to the College of Engineering; admission to this program is generally more competitive than admission to other engineering majors. Applicants who know which field of engineering they wish to study should apply to that major.

Curriculum Overview

The Engineering Undeclared curriculum provides students the opportunity to explore the various majors in the College of Engineering while completing the core Math, Physics and Chemistry courses required of all Engineering students in their first two years.

Undergraduate Programs

The College of Engineering's bachelor of science programs are designed to equip graduates with a full command of engineering principles and practice, and the tools to become leaders in their chosen profession. The lower division curriculum emphasizes foundations in mathematics, science and engineering, leading to more focused upper division coursework in one of the engineering programs, and in many cases, specific specializations or emphases within the program. The curriculum also calls for study of the humanities and social studies to supply additional skills needed to compete in a global economy.

Degree Requirements

Students must complete a minimum of 120 units, in which they must satisfy the University of California and UC Berkeley campus requirements outlined in this Bulletin. In addition, students must complete the requirements for the College of Engineering and for one BS program. Full details on these requirements can be found in the *College of Engineering Announcement: A Guide to Undergraduate and Graduate Study* (http:// coe.berkeley.edu/college-of-engineering-announcement).

Accreditation

The following programs are accredited by the Engineering Accreditation Commission of ABET, Inc., 111 Market Place, Suite 1050, Baltimore, MD 21202-4012; (410) 347-7700: civil engineering, electrical and computer engineering, industrial engineering and operations research, materials science and engineering, mechanical engineering, and nuclear engineering. In addition, the computer science and engineering program is accredited by the Computing Accreditations Commission of ABET, Inc.

Graduate Programs

The College of Engineering offers Master of Science (MS), Master of Engineering (MEng) and Doctor of Philosophy (PhD) degrees. See Overview above or the section for your department of interest for information on specific degrees awarded by department. The Master of Science and Doctor of Philosophy degrees emphasize engineering and applied sciences, while the Master of Engineering degree program emphasizes advanced professional studies.

Degree Requirements

Graduate students must follow the degree and scholarship requirements outlined in the Graduate Education (<u>http://bulletin.berkeley.edu/</u><u>archive/2013-14/graduateeducation</u>) section of this Bulletin and in the Graduate Division's *Guide to Graduate Policy* (<u>http://grad.berkeley.edu/</u><u>policies</u>).

Graduate Admission

Interested applicants should follow the procedures outlined in the Graduate Education (<u>http://bulletin.berkeley.edu/archive/2013-14/</u> <u>graduateeducation</u>) section of this Bulletin. See the website of your department or program of interest for further details.

Note: Students may not apply for the MS only, although it may be awarded to students pursuing work toward the PhD after fulfillment of the appropriate requirements.

ENGIN 7 Introduction to Computer Programming for Scientists and Engineers 4 Units

Department: Engineering Course level: Undergraduate Terms course may be offered: Fall, spring and summer Grading: Letter grade.

Hours and format: 2 hours of Lecture, 1 hour of Discussion, and 4 hours of Laboratory per week for 15 weeks. 3 hours of Lecture, 1.5 hours of Discussion, and 6 hours of Laboratory per week for 10 weeks. Prerequisites: Mathematics 1B (maybe taken concurrently). Elements of procedural and object-oriented programming. Induction, iteration, and recursion. Real functions and floating-point computations for engineering analysis. Introduction to data structures. Representative examples are drawn from mathematics, science, and engineering. The course uses the MATLAB programming language. Sponsoring departments: Civil and Environmental Engineering and Mechanical Engineering.

Formerly known as 77.

ENGIN W7 Introduction to Computer Programming for Scientists and Engineers 4 Units

Department: Engineering Course level: Undergraduate Term course may be offered: Summer Grading: Letter grade. Hours and format: 3 hours of web lecture, 1.5 hours of web discussion,

and 6 hours of web laboratory per week for 10 weeks. This is an online course.

Prerequisites: Mathematics 1B (may be taken concurrently). Elements of procedural and object-oriented programming. Induction, iteration, and recursion. Real functions and floating-point computations for engineering analysis. Introduction to data structures. Representative examples are drawn from mathematics, science, and engineering. The course uses the MATLAB programming language. Instructor: Papadopoulos

ENGIN 10 Engineering Design and Analysis 3 Units

Department: Engineering Course level: Undergraduate Terms course may be offered: Fall and spring Grading: Letter grade.

Hours and format: 3 hours of Lecture and 3 hours of Laboratory per week for 15 weeks.

This is a is an introduction to the profession of engineering and its different disciplines through a variety of individual design and analysis projects. Hands on creativity,teamwork, and effective communication are emphasized. Common lecture sessions address the essence of engineering design, the practice of engineering analysis, the societal context for engineering projects and the ethics of the engineering profession. Students develop design and analysis skills, and practice applying these skills to illustrative problems drawn from various mechanical engineering topics such as material testing,aerodynamics, controls and design.

Course Objectives: The objectives of the course are to:enhance critical thinking and design skills;introduce students to a broad view of engineering analysis and design;reinforce the importance of mathematics and science in engineering design and analysis;emphasize communication skills, both written and oral;develop teamwork skills;offer experience in hands on,creative engineering projects;provide an introduction to different fields of engineering; andintroduce students to professional ethics and the societal context of engineering practice. **Student Learning Outcomes:** Through active participation in this course,students will:begin to recognize the role of mathematics and science in engineering; understand the design of systems, components, and processes to meet desired needs within realistic constraints;gain experience in working in multi-