

# Engineering, Jacobs School of

OFFICE: 7310 Engineering Building Unit 1,  
Warren College  
<http://www.soe.ucsd.edu>

The Irwin and Joan Jacobs School of Engineering at UCSD comprises the Departments of Mechanical and Aerospace Engineering (MAE), Bioengineering (BE), Computer Science and Engineering (CSE), Electrical and Computer Engineering (ECE), and Structural Engineering (SE). The MAE Department oversees traditional programs in chemical and mechanical engineering. The program in aerospace engineering is jointly managed by MAE and SE. The Jacobs School is directed by the dean of engineering. The departments offer many undergraduate and graduate degree programs. Students interested in engineering should consult the individual department listings which follow this section of the catalog.

The general-education requirements of UCSD's five undergraduate colleges differ noticeably. In some cases, these requirements can extend the time required to obtain a B.S. degree in engineering. Prospective students should review the general-education requirements and take them into account when selecting a college.

## Admission to the Jacobs School of Engineering

Student demand exceeds program capacity in several of the undergraduate majors. Therefore, admission into an impacted engineering major is based on academic excellence demonstrated at UCSD, in high school, or at a community college. Admission will be granted to the maximum number of students in each of these impacted major programs consistent with maintaining acceptable program quality and in compliance with admissions procedures and criteria approved by the Academic Senate's Committee on Educational Policy.

### FRESHMAN

Freshman are admitted to engineering majors in one of two ways, either directly into the major of their choice or into a preliminary pre-major of their choice. The only way to become a Computer

Science (CS), Electrical Engineering (EE), Bioengineering (BE) or Bioengineering: Biotechnology, or Computer Engineering (CE) major is to be directly admitted as an entering freshman (transfer students see TRANSFERS section below). This selection is based on the student's high school GPA and SAT performance as well as the ability of the particular major to accept new students.

The pre-major, which does not apply to the impacted majors listed above, is a provisional status and acceptance to major status is dependent on performance in selected screening courses. Students are notified of their status when they are admitted to UCSD. Major and pre-major students both receive the same college and departmental advising and are expected to take the same courses. In addition to the required science, math, and engineering courses required by the departments, it is expected that all students will also take twelve to eighteen units of general-education college requirements during their first year.

It is strongly suggested that both majors and pre-majors consult their department's academic adviser at an early stage to plan their lower-division engineering courses, and that they consult with a college academic counselor to arrange general-education courses around the required screening courses. Students admitted fall quarter should attend the engineering department's orientation meetings during Welcome Week.

**Pre-major engineering students** are expected to apply for admission to a major during the spring quarter of their freshman year. Selected introductory math, science, and engineering courses will be used as screening courses in order to determine which of the pre-major students will be accepted into a major and which will not be accommodated by the Jacobs School of Engineering. Admission to a major is based on the grade-point average in the screening courses only for those students who are able to apply by the end of their third quarter. The grade-point average required for admission to the major by pre-majors is set individually by each engineering program and varies substantially according to the ability of the program to accommodate extra students. Pre-majors should consult their departments concerning the appropriate screening courses and the current grade-point average standards for admission. However, a B average in the screening courses will guarantee admission

to any of the majors when application is made before the end of the third quarter of study at UCSD.

**Pre-major engineering students** who are not able to apply before the end of their third quarter, or who wish to reapply following an unsuccessful application, must apply before the end of their sixth quarter of study at UCSD. **No admission to an engineering major will be considered after six quarters of study.** The admission review after the third quarter will not be based only on the grade-point average in the screening courses alone. Admission review, after the third quarter, will also include consideration of the student's entire academic record, progress in science, math and engineering courses, and other factors such as course load and trends in performance.

### TRANSFERS

Following California's Master Plan for Higher Education, The Jacobs School of Engineering gives high priority to students transferring from California community colleges. Transfer students are typically admitted as pre majors and given three quarters to satisfy the departmental requirements for full admission to the major. The only way to become a Computer Science (CS) or Computer Engineering (CE) major is to be directly admitted as an entering transfer student. Effective fall 2004, the only way to become an Electrical Engineering, Bioengineering or Bioengineering: Biotechnology major will also be as a directly admitted entering transfer student. Since admission of transfer students to an engineering major is quite competitive, applicants, especially in impacted majors such as Computer Science (CS), Computer Engineering (CE), and effective fall 2004, Electrical Engineering, Bioengineering, and Bioengineering: Biotechnology, must demonstrate both completion of most of their lower-division courses at the community college and a high level of scholastic performance in these courses. (Impacted majors are majors to which, owing to limited departmental resources, more students apply than can be accepted.)

Pre-major and major status in impacted majors such as Computer Science, Computer Engineering (and effective fall 2004, Electrical Engineering, Bioengineering, and Bioengineering: Biotechnology) may be limited to the best transfer applicants, e.g., those who have been admitted to UCSD with the most complete lower-division preparation and the highest college GPAs. Since

admissions are restricted in these majors, transfer students are encouraged to apply to more than one major degree program. REMEMBER THAT ADMISSION TO THE UNIVERSITY AND TO A COLLEGE DOES NOT GUARANTEE A STUDENT ADMISSION TO AN IMPACTED MAJOR.

Effective fall 2001, applicants seeking admission as transfer students will be considered only for direct admission into the Computer Science (CS) or Computer Engineering (CE) majors in the Department of Computer Science and Engineering (CSE) or the Department of Electrical and Computer Engineering (ECE).

Students seeking admission to CSE or Computer Engineering in either the CSE or ECE department must apply for admission to the major upon entry to UCSD. Effective fall 2004, applicants seeking admission as transfer students to the Electrical Engineering, Bioengineering and Bioengineering: Biotechnology majors will only be considered for direct admission into those majors. Students seeking admission to the Department of Mechanical and Aerospace Engineering (MAE) or the Department of Structural Engineering (SE) should complete

at least six courses (science, mathematics, and/or engineering) at UCSD prior to submitting an application. Two of the six courses may be in progress when applying in the third quarter. Prior to fall 2004, students seeking admission into the Bioengineering: Premedical and Bioengineering: Bioinformatics majors in the Department of Bioengineering (BE) must complete at least two required pre-bioengineering or bioengineering courses, one of which must be an upper-division course. MAE, SE, and BE transfer students are evaluated on an individual basis on performance at UCSD and their previous schools. Transfer students entering the university with fewer than 36.0 quarter units will have six quarters to apply. Effective fall 2004 transfer students will be directly admitted to Bioengineering and Bioengineering: Biotechnology majors and the above rules will only apply to the Bioengineering: Premedical degree program. Transfer students must seek a preliminary appraisal by the department as soon as possible after they arrive on campus.

Since admissions are restricted, pre-engineering students may apply to more than one major degree program. Applications must be submitted to the appropriate Undergraduate Affairs Office, in MAE (182 Engineering Building II), Bioengineering

(4103 Engineering Building I), CSE (3402 Applied Physics and Mathematics Building), ECE (2718 Engineering Building I), or Structural Engineering (349 SERF). These offices may be consulted for additional details.

---

## Admission of Non-Engineering Majors to the Jacobs School of Engineering Courses

---

The number of students admitted to some courses offered by the Jacobs School of Engineering must be restricted to meet the resources available. Students who have successfully completed all prerequisite courses will be admitted to these restricted courses in the following order:

1. Students admitted by the department to a major curriculum
2. Students admitted by the department to a minor curriculum
3. Students fulfilling a requirement for another major
4. All others, with permission of the department and instructor

Students should check with the departments concerning the limitations on specific courses and the requirements needed prior to attempting to enroll.

---

## Double Majors and Minors

---

It is the Jacobs School of Engineering policy not to approve double majors within engineering. Students who qualify for admission to graduate school and who have the extra time are encouraged to consider co-terminal B.S./M.S. degrees in one or two engineering disciplines. Engineering minors may be taken only by non-engineering majors.

---

## Engineering Student Services (ESS)

---

The Jacobs School of Engineering supports several programs that promote academic and professional development for undergraduate students across all engineering departments. **ESS** programs are coordinated with the faculty and departments and include the Undergraduate Engineering Student Council and Engineering

Student Professional Organizations, Engineering Student Employment Opportunities, the Internship Program, Pre-College Outreach, and the **MESA** Engineering Program (**MEP**).

MESA, the Mathematics, Engineering and Science Achievement Program, is a statewide effort to prepare more students from historically underrepresented backgrounds for careers in mathematics and science-based professions. MEP has been established to attract and retain qualified underrepresented students in engineering. MEP programs include academic advising and workshops, scholarships, opportunities for summer employment, and a variety of social events throughout the year. Strong support from local industry provides students the opportunity to explore career possibilities as early as their freshman year.

All engineering students are encouraged to become involved with ESS programs. Further information can be obtained at the ESS office in Room 1400, Engineering Building I.

---

## COURSES

---

### 101. Team Engineering (4)

Fundamental principles of team engineering practice. Team formation and leadership, project creation and management, statistical tools for quality improvement, engineering business economics, law, and ethics. Interdisciplinary student teams will research, refine, and propose the design, manufacture, and marketing of a novel engineering product. Four hours of lecture. Prerequisite: a course in probability of statistics.

### 201. Venture Mechanics (4)

Examines the engineering/entrepreneurism interface. Discovery, development, and implementation of new product ideas. Understanding markets, competitors, and selling innovations. Cultivating effective working relationships between research, engineering, manufacturing, and marketing elements of an organization. Priority enrollment given to engineering majors.

### 202. Enterprise Dynamics (4)

Case studies of start-ups, strategic technology management, practice in use of industrial decision-making tools, and speakers from successful firms combined with experience in making management decisions dynamically in a competitive computer-simulated enterprise. Field study of ongoing processes in a local high technology company. Priority enrollment given to engineering majors.

### 203. Applied Innovations (4)

Course includes the examination of business plans developed by early stage technology businesses. Students expected to work on the development of business plans for real, innovative business organizations. Will explore all of the business research and analysis that needs to be undertaken in order to develop a complete business plan. Completion of ENG 201 or ENG 202 preferred.

**204. Theory and Practice of University Teaching (2)**

Teaching and learning at the college/university level. Readings in engineering and cognitive science, plus opportunities for teaching and evaluating college level students. Covers theoretical underpinnings and the practice of teaching. Participation in some practicum teaching experience will be required.