

ELECTRICAL ENGINEERING 2008-09



UNIVERSITY OF CALIFORNIA, SANTA CRUZ

THE ELECTRICAL ENGINEERING MAJOR

The electrical engineering curriculum provides a balance of engineering science and design and allows students to specialize in both the traditional topics and the latest subjects in electrical engineering. Students may concentrate their electives in the areas of electronics and optics or communications, signals, systems, and controls. The major is designed to attract motivated students who, upon graduation, will be sought by employers in the high-tech industry.

STUDY AND RESEARCH OPPORTUNITIES

- ◆ B.S., M.S., Ph.D., and Undergraduate Minor
- ◆ Two concentrations: Electronics/optics and Communications, signals, systems, and controls
- ◆ Honors versions of selected courses are offered in the Jack Baskin School of Engineering to qualified students.

ADMISSION TO THE JACK BASKIN SCHOOL OF ENGINEERING (BSOE)

Please see the current *UC Santa Cruz General Catalog* for a full description of the BSOE admissions policy.

Freshman Applicants: Admission into a BSOE major is based on high school grade point average, test scores, courses completed in mathematics and sciences, and/or the personal statement. Applicants who are not accepted into the major at the time of admission to UCSC may still reapply for admission to the major after enrolling at UC Santa Cruz.

Transfer Applicants: Admission into the major will be based on the student's academic college record. Applicants are encouraged to take and excel in as many courses that are equivalent to the department's foundation courses as possible (see *Transfer Preparation* section). An applicant will be approved, conditionally approved, or declined. Only students who have completed all or most of the foundation courses will be approved or conditionally approved for the major.

HIGH SCHOOL PREPARATION

It is recommended that high school students intending to apply to the BSOE have completed four years of mathematics (through advanced algebra and trigonometry) and three years of science in high school, including one year each of chemistry, physics, and biology. Comparable college mathematics and science courses completed at other institutions may be accepted in place of high school preparation. Students without this preparation may be required to take additional courses to prepare themselves for the program.

Students are expected to have the mathematical background to be able to register for Math 19A, *Calculus for Science, Engineering, and Mathematics*, during their first quarter in order to be able to register for Physics 5A, *Introduction to Physics I*, during their first year. Those students who do not have this preparation from high school are encouraged to take a pre-calculus course during the summer before entrance into UCSC.

TRANSFER PREPARATION

The BSOE strongly encourages applications from transfer students. Due to the prerequisite structure for upper-division courses, it is necessary for prospective transfer students to have completed as many of the lower-division requirements for the respective majors as possible to complete the degree within a reasonable time. Students must plan carefully because many courses must be taken sequentially. Applicants are encouraged to take and excel in as many courses that are equivalent to the department's foundation courses as possible. UC Santa Cruz foundation courses in electrical engineering are:

- Mathematics 19A-B, *Calculus for Science, Engineering, and Mathematics* (two quarters)
- Applied Mathematics & Statistics 10, *Mathematical Methods for Engineers I*, and Applied Mathematics & Statistics 20, *Mathematical Methods for Engineers II*
- Physics 5A, *Introduction to Physics I*, Physics 5B, *Introduction to Physics II*, and Physics 5C, *Introduction to Physics III*

Transfer students should not follow the Intersegmental General Education Transfer Curriculum (IGETC) because it will not provide transfer students with enough mathematics and engineering courses to allow them to complete these programs at UC Santa Cruz in two years.

In addition to the foundation courses required for admission, some transfer students may choose to take other articulated lower-division courses for the major. Such courses are listed on the web site www.assist.org. For a complete list of lower-division courses for the major, visit www.ee.ucsc.edu/undergraduates.

CAREERS

Analog electronics	Opto-electronics
Antenna design	Radar systems
Biomedical electronics	Remote sensing
Biophotonics	Semiconductor device
Communications	physics
Control systems	Signal/image/video
Digital electronics	processing
Electronics packaging	Wireless communications
Fiber optics	VLSI design
Information theory	
Microwave circuits	
Nanotechnology	

These are only samples of the field's many possibilities.

INTERNSHIPS, FIELDWORK, AND EDUCATION ABROAD OPPORTUNITIES

Many students find internships and fieldwork to be a valuable part of their academic experience. They work closely with faculty and career advisers in the BSOE and in the UC Santa Cruz Career Center to identify existing opportunities and often to create their own internships with local companies or in nearby Silicon Valley. For more information about internships, visit intern.ucsc.edu or talk to your faculty adviser.

BSOE students may wish to develop their cross cultural competency, typically via the Education Abroad Program (EAP). Interested students must work very closely with the faculty and academic advisers in their major very early during the freshman or sophomore year to create a plan for transferability of course work towards graduation. For more EAP information, visit eap.ucop.edu/eap/country/default.htm.

RECOGNITION

Faculty in Electrical Engineering have received numerous national and international honors and awards. They have been elected as Fellows of the Institute of Electrical and Electronic Engineers, the American Association for the Advancement of Science, and the Association of Computing Machinery, to name a few. They have been awarded prestigious faculty fellowships such as those from the Sloan Foundation, the David and Lucille Packard Foundation, and the Alexander von Humboldt Foundation. In addition, they have been recipients of the IEEE Third Millennium Medal, the Rank Prize in Optoelectronics, and the Mac Van Valkenberg Award of the IEEE Systems and Circuits Society. Four of the Electrical Engineering faculty have won NSF CAREER Awards.

MISSION AND PROGRAM OBJECTIVES

The mission of the Electrical Engineering Department is to build and sustain a teaching and research program to provide undergraduate and graduate students with inspiration and quality education in the theory and practice of hardware and information processing-oriented electrical engineering, with an emphasis on interdisciplinary activities, complementing the computer science and computer engineering programs, serving industry, science, and government, and bringing faculty and staff a rewarding career in teaching, research, and service.

The educational objectives that the Electrical Engineering Department strives to provide for students are focused on five areas: fundamental prerequisites in theory, design, and basic science for a career based on electrical engineering; a scope of application that provides theory and practical knowledge as well as specialized training in hardware and information-oriented electrical engineering; a professional approach to engineering in terms of high-quality work skills in communication, teamwork, responsibility, high ethical standards, and participation in lifelong learning and the professional engineering community; encouragement and motivation based on a milieu of readily available opportunities, mentoring, and advising; and the basis for a successful transition to an engineering career, including an ability to apply research to engineering and opportunities for experience in an industry setting.



FOR MORE INFORMATION

For further information about the electrical engineering major, see:

reg.ucsc.edu/catalog/html/programs_courses/eePS.html

The electrical engineering page of the BSOE web site can be found at:

www.ee.ucsc.edu/undergraduates

If you have other questions, contact:

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