

COMPUTER ENGINEERING

2009-10



UNIVERSITY OF CALIFORNIA, SANTA CRUZ

THE COMPUTER ENGINEERING MAJOR

The computer engineering curriculum's focus is making digital systems that work. The program's emphasis on interdisciplinary system design provides both excellent training for future engineers and strong background for graduate study. The computer engineering program is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET).

STUDY AND RESEARCH OPPORTUNITIES

- ◆ B.S., M.S., Ph.D.
- ◆ An accelerated combined B.S./M.S. degree in computer engineering is available that enables eligible undergraduates to move without interruption to the graduate program.
- ◆ Five concentrations: robotics and control, systems programming, computer systems, networks, digital hardware
- ◆ Minor in computer engineering
- ◆ Minor in computer technology

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: Early 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. Once at UCSC, students will be accepted into the major based on grade point average in courses offered by the BSOE and the Division of Physical and Biological Sciences, as well as, in the second year, completion of major requirements.

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 lower-division courses (see *Transfer Preparation* section) as possible. Only students who have completed any four courses required for the major will be considered for admission to 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, if possible 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 who would otherwise not be able to enroll in Mathematics 19A, *Calculus for Scientists and Engineers*, should consider taking precalculus during the summer before coming to 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 computer engineering major as possible in order to complete the degree within a reasonable time. Students must plan carefully because many courses must be taken sequentially. Applicants must take and excel in as many courses for the major as possible. Completion of mathematics courses through differential equations and linear algebra is particularly important.

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.

Transfer students should focus on articulated lower-division courses for the major listed on the web site www.assist.org. For a complete list of lower-division courses for the major, visit www.ce.ucsc.edu/academics/undergraduate.

MISSION AND PROGRAM OBJECTIVES

Computer engineering focuses on the design, analysis, and application of computers and on their applications as components of systems. The UC Santa Cruz Department of Computer Engineering sustains and strengthens its teaching and research program to provide students with inspiration and quality education in the theory and practice of computer engineering.

The UC Santa Cruz computer engineering program prepares graduates for a rewarding career in engineering. UC Santa Cruz computer engineering graduates will have a thorough grounding in the principles and practices of computer engineering and the scientific and mathematical principles upon which they are built; they will be prepared for further education (both formal and informal) and for productive employment in industry.

CAREERS

Assistive technologies	Network administration
Communications design	and security
Computer hardware and software	Remote sensing
Computer system design	Robotics and autonomous systems
Control system design	Signal/image/video processing
Digital electronics	Wireless communications
Embedded system design	VLSI design
Environmental monitoring	
FPGA design	
Multimedia	<i>These are only samples of the field's many possibilities.</i>
Nanotechnology	

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 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.

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/our_programs/countries.

UNDERGRADUATE RESEARCH

Departmental faculty are focused on multidisciplinary hardware and software research including computer system design, design technologies, computer networks, embedded and autonomous systems, digital media and sensor technology, assistive technologies, and robotics. Many undergraduates

contribute to Computer Engineering Department research activities as independent study students or paid employees, for example as part of the National Science Foundation-funded Summer Undergraduate Research Fellowship in Information Technology, surf-it.soe.ucsc.edu.

STUDENT ORGANIZATIONS

Many undergraduates work with engineering and science faculty on their research projects, analyzing ideas, developing technologies, and discovering new approaches. Undergraduates from UCSC and other schools may take part in SURF-IT (see *Undergraduate Research* above), or in the UC LEADS program, while others are recruited by faculty directly out of classes.

Computer Engineering students and faculty are particularly active in UCSC chapters of the Institute for Electrical and Electronic Engineers, National Society of Black Engineers, Society of Hispanic Professional Engineers, Society of Women Engineers, and Tau Beta Pi Honor Society, as well as the many mentoring and support programs in the Baskin School of Engineering and at UCSC.

www.ce.ucsc.edu/academics/undergraduate
surf-it.soe.ucsc.edu
www.ucop.edu/ucleads
www.soe.ucsc.edu/advising/organizations



ALUM FOCUS

Dr. Aman Shaikh (M.S., computer engineering, '00; Ph.D., computer science, '03), is a member of Network Measurement and Engineering at AT&T Labs–Research.

FOR MORE INFORMATION

For further information about the computer engineering major, see:

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

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

www.ce.ucsc.edu/academics/undergraduate

If you have other questions, contact:
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