

Electrical Engineering



Co-op and Internship Programs

Situated in the heart of Silicon Valley, a mecca of innovation and entrepreneurship, SCU offers electrical engineering students unsurpassed opportunities for corporate internships and cooperative education. Working with an industry partner in a business setting provides an invaluable range of experiences and allows students to put their academic prowess to work.

Study Abroad

Studying in a foreign country offers direct experience in other cultures that is important preparation for the global workplace. Students with strong academic standing can spend one or more terms abroad and still complete their coursework and graduate within four years. Early, careful planning can make it happen!

After Graduation

SCU's mix of practical and theoretical experiences and our commitment to academic and ethical excellence cultivate outstanding electrical engineers who are highly sought-after candidates for both higher education and employment. Our undergraduate students are well prepared for advanced study at any of the top graduate schools across the country. Employers in Silicon Valley and throughout the world provide a wealth of opportunities for SCU electrical engineers in a variety of career paths.



Faculty

Timothy Healy, professor, Ph.D., University of Colorado. *Expertise:* electromagnetics and communication

Christopher Kitts, associate professor of mechanical engineering; courtesy appointment in electrical engineering, Ph.D., Stanford University. *Expertise:* robotics, mechatronics, controls, autonomous reasoning

Shoba Krishnan, chair, associate professor, Ph.D., Michigan State University. *Expertise:* analog and mixed-signal IC design and testing

Samiha Mourad, IEEE Fellow, Ph.D., Michigan State University. *Expertise:* ASIC design and testing

Tokunbo Ogunfunmi, associate professor, Ph.D., Stanford University. *Expertise:* signal processing and multimedia

Mahmudur Rahman, associate professor, Dr. Eng., Tokyo Institute of Technology. *Expertise:* microelectronics

Sarah Kate Wilson, associate professor, IEEE Fellow, Ph.D., Stanford University. *Expertise:* wireless communications, digital communications

Sally Wood, Thomas J. Bannan Professor, IEEE Fellow, Ph.D., Stanford University. *Expertise:* digital image and signal processing

Cary Y. Yang, professor, founding director, Center for Nanostructures, IEEE Fellow, Ph.D., University of Pennsylvania. *Expertise:* nanoelectronics, materials interfaces

Aleksandar I. Zecevic, professor, Ph.D., Santa Clara University. *Expertise:* control of large power systems, parallel computation, simulation

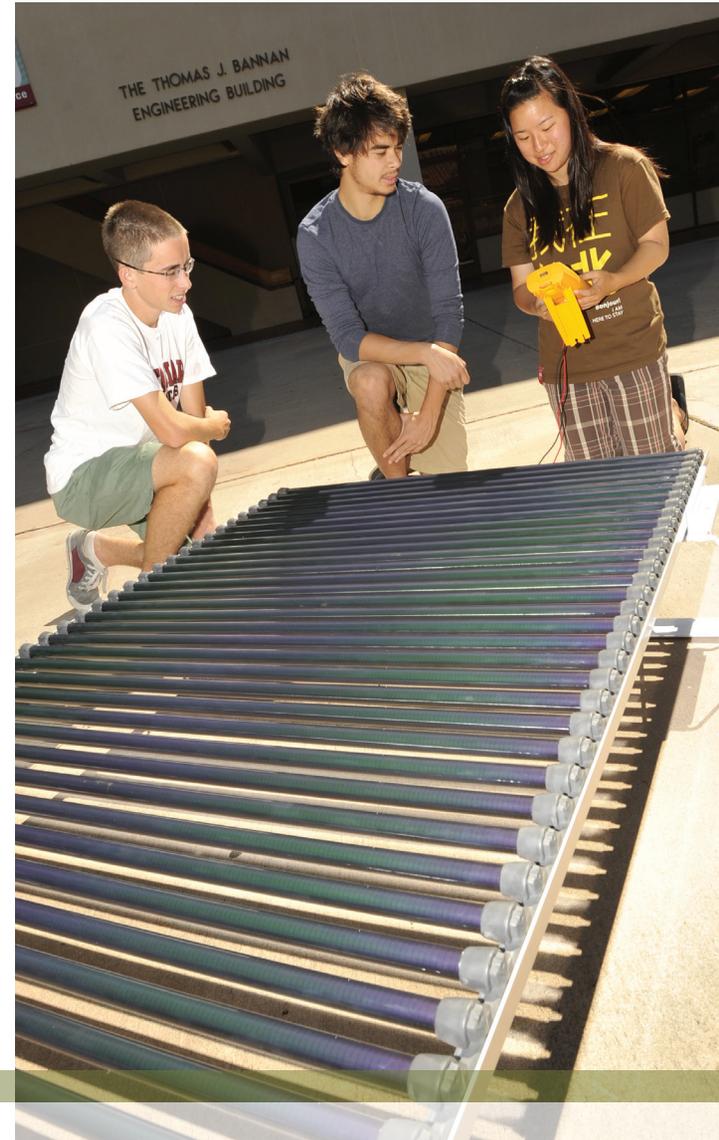
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Electrical Engineering



The field of electrical engineering encompasses the design, manufacture, test, and operation of electrical components, circuits, and systems.

Those who take on this challenge use their knowledge and skills in a wide range of applications, including energy systems, nanotechnology, mobile communication, digital systems and architectures, analog and digital electronics, embedded systems, video processing, and robotics.

Our Program

The electrical engineering department offers a comprehensive education for bachelor's, master's, and Ph.D. students. We prepare students for careers in electrical engineering, and we also emphasize the role of engineers in making a positive contribution to the betterment of society and the human condition. Balancing a solid theoretical foundation with substantial hands-on laboratory experience and a curriculum that challenges students to act ethically prepares our students for a variety of career paths. Graduates are well equipped for advanced study or entry into the workforce as valued contributors to society.

The electrical engineering programs are supported by the facilities of the University's Academic Computing Center, as well as by the School of Engineering Design Center. The department has 10 major teaching and research laboratories and a laboratory dedicated to the support of senior design projects.

A four-year program may include a co-op experience, study abroad, a minor in another discipline, or participation in the combined B.S./M.S. program, which can lead to a master's degree in the fifth year.

Educational Objectives

The electrical engineering undergraduate major has four specific educational objectives; namely, to enable our graduates to

- become successful professionals, reflecting the breadth of the new University Core Curriculum, applying the fundamental concepts of electrical engineering science and engineering practice to the solution of practical problems, within engineering or in another field;
- work effectively within teams and communicate effectively to solve complex engineering problems, or other problems;



- act with responsibility within society in light of the obligation that engineers have to design and develop effective products that are of positive value to society, and practice leadership in advising society on approaches to tackle its current problems and on the wisdom of proposed solutions, and act with honesty and wisdom, with courage and compassion; and
- be driven to continue learning by an inherent curiosity for discovery, enjoying and embracing lifelong learning as a necessity for personal growth and societal improvement.

Curriculum

Our undergraduate program is design-oriented and laboratory-intensive, emphasizing hands-on experience and teamwork that is crucial to success in a competitive workplace. The curriculum includes fundamental electrical engineering courses in circuits, electronics, digital systems, electromagnetics, and semiconductors. Students may select emphasis areas by choosing electives in energy systems, nanotechnology, mobile communication, electronic devices and materials, robotics and control, digital and analog design, or signal and information processing.

Laboratory experience with modern instruments, design tools, and components is an important aspect of undergraduate courses in the electrical engineering program. This complements classroom instruction and exposes students to work environments similar to what they may experience after graduation.

Senior Design and Research

The senior design project is a comprehensive and intensive capstone project requiring in-depth application of the skills learned during the preceding three years. From initial concept development through analysis, design, and report writing, this experience replicates the process demanded of engineers in practice. A highlight of the academic year, the Senior Design Conference affords students an opportunity to present their projects before a panel of alumni and other invited industry judges.

Student research is a priority at Santa Clara University, and our students are actively involved in exciting, meaningful research from their earliest undergraduate days. Students in the electrical engineering program can participate in groundbreaking research as early as their freshman year.