



# Bachelor of Science in Electrical Engineering

College of Engineering and Computer Science

## **Why major in electrical engineering at Cal State Fullerton?**

The Bachelor of Science in Electrical Engineering provides students with the ability to apply advanced design and analysis knowledge of electronic circuits, computer architecture, microprocessors, and communication networks and control systems in an effective and professional manner. Our laboratory experiments are designed to emphasize the fundamentals of engineering practice and to provide practical experience on a scale small enough for lab work but large enough to simulate field conditions. Use of state-of-the-art computer hardware and software is integrated throughout the curriculum.

**Teaching is our first priority.** We focus on undergraduate education and master's degree programs rather than doctoral programs. As a result, our faculty members devote more time to teaching rather than fulfilling the demands of a heavy research schedule usually required by doctoral programs. In addition to the teaching skills of the electrical engineering faculty members, all of our classes, even at the introductory level, are small.

**Distinguished faculty.** Our faculty members are experienced professionals who hold doctoral degrees from prestigious universities. Although teaching is their first priority, most of them have active research programs in electrical engineering or electrical engineering education. Corporate funding makes important contributions to the support of the department's work. The full-time faculty members are supplemented by adjunct faculty who bring students important knowledge of current practices and trends in the electrical engineering profession.

**Preparation for graduate work.** The Bachelor of Science degree in Electrical Engineering is designed to be flexible enough to provide excellent preparation for graduate work. Many of our students, including those who have full-time positions in industry, continue their education and obtain advanced degrees.

**Student participation in research.** Although the college does not require undergraduate research, many of our students participate in one or more research projects before graduation. Most grant-supported research in the department includes funds to support undergraduate students. Several of our undergraduate students have co-authored research papers with faculty members.

**Industrial partnerships.** Partnerships with leading companies enable students and faculty members to collaborate on funded projects of mutual interest with the firms' engineers. Students gain invaluable practical experience and develop the skills to work effectively in an interdisciplinary environment. Funding and internship programs come from corporate sources such as Boeing, Thales-Raytheon, Parasoft, KOR Electronics and Rockwell Collins.

**Accreditation.** The Bachelor of Science degree in Electrical Engineering at Cal State Fullerton is accredited by the Accreditation Board for Engineering and Technology (ABET). The accreditation process includes both an internal review, as well as an external review by an evaluation team with members drawn from academic institutions, government, industry and private practice.

**What types of career opportunities are available?**

Electrical engineers work in the areas of design and analysis of digital and analog electronic circuits, computer architecture, microprocessors, digital signal processing, communication networks and control systems. Cal State Fullerton graduates are employed practically in every field, including manufacturing, transportation, construction, business, education, government, health care and many other areas. The B.S. in Electrical Engineering prepares students for a variety of careers depending upon the specialization selected. The range of opportunities is virtually unlimited.

Electrical engineers participate in designing products that meet human needs for today and tomorrow—from huge power-generating systems in dams to the tiny electronic circuits that keep spacecraft on correct trajectory a million miles from earth. They might create the electronic components that run computers, cars, television sets, stereo systems, navigation systems, GPS, PDAs, USB devices and automated factories or seek ways to improve the transmission of messages by laser beams.

**What courses are required?**

All electrical engineering majors take 35 units of foundation courses in mathematics and the sciences, 30 units of general education courses, and 50 units of required courses in electrical engineering, and 14 units of technical electives, for a total of 129 units.

**Mathematics and Science Courses (35 units)**

Mathematics 150A and B, 250A and B; Chemistry 115; Physics 225 and 225L, 226 and 226L, 227 and 227L and Biology 101.

**General Education Courses (30 units)**

Students complete courses to fill the following categories: Core Competencies, Historical and Cultural Foundations, Disciplinary Learning and Cultural Diversity. Specific courses to meet these requirements are listed under the "Electrical Engineering" section in the university catalog.

### **Required Courses in Electrical Engineering (50 units)**

Comp Sci 121 Programming Concepts (3)  
EGEE 203 Electric Circuits (3)  
EGEE 203L Electric Circuits Lab (1)  
EGEE 215 Solving Engineering Problems using MATLAB (1)  
EGEE 245 Computer Logic & Architecture (3)  
EGEE 245L Computer Logic & Architecture Lab (1)  
EGEE 280 Microcontrollers (3)  
EGEE 281 Designing with VHDL (2)  
EGEE 303 Electronics (3)  
EGEE 303L Electronics Lab (1)  
EGEE 308 Engineering Analysis (3)  
EGEE 309 Network Analysis (3)  
EGEE 310 Electronic Circuits (3)  
EGEE 310L Electronic Circuits Lab (1)  
EGEE 311 Field Theory and Transmission Lines (3)  
EGEE 313 Introduction to Electromechanics (3)  
EGEE 313L Power Lab (1)  
EGGN 314 Engineering Economy (2)  
EGEE 323 Engineering Probability and Statistics (3)  
EGEE 409 Introduction to Linear Systems (3)  
EGEE 485 Electrical Engineering Design Projects Lab (3)  
OR EGE 407L Digital Computer Design Lab (3)  
EGEE 490 Seminar in Electrical Engineering (1)

### **Technical Electives in Electrical Engineering (14 units)**

Students choose elective courses with the approval of their adviser from the following areas: VLSI and Electronic Circuits, Communication Systems and Signal Processing, Control Systems and Computer Engineering.

Please refer to the Department of Electrical Engineering section of the university catalog for additional information.

### **Second Language Graduation Requirement**

Since the Bachelor of Science in Electrical Engineering is a high-unit program, majors are exempt from the Second Language Graduation Requirement.

### **Are there special programs or internships available?**

Electrical engineering majors may take advantage of the opportunities provided by the Center for Internships and Service-Learning. Internships provide students with opportunities to gain work experience, network and develop industry contacts, earn academic credit, solidify academic and career goals, earn money while learning and explore various career options within the major.

In addition, the Center for Academic Support in Engineering and Computer Science (CASECS) provides services that help educationally disadvantaged students achieve a higher level of academic success in engineering and computer science. For more information, please call (714) 278-3879.

## **What types of financial aid and scholarships are available?**

The Emmett D. Burnett Scholarship and the Eugene Birnbaum Award are awarded to eligible students in the College of Engineering and Computer Science. Additional scholarships are available to students in the major from off-campus sources such as professional societies, civic foundations and corporations.

For financial aid consideration, please call the Office of Financial Aid at (714) 278-3125, for additional details and information.

## **How can I get involved?**

Academic preparation is just one facet of our program. Students enjoy opportunities for leadership and participation in clubs and organizations, research, community service and assistantships. Students can choose from a roster of award-winning professional student organizations, including the Institute of Electrical and Electronic Engineers (IEEE), Institute of Navigation (ION), Instrumentation, Systems and Automation Society (ISA), National Society of Black Engineers (NSBE), Society of Hispanic Professional Engineers (SHPE), Society of Mexican-American Engineers and Scientists (MAES), Society of Women Engineers (SWE), Eta Kappa Nu Electrical Engineering Honor Society, and Tau Beta Pi Engineering Honor Society (TBP).

## **Who advises me?**

Electrical engineering students are advised by the department's faculty members. Students may make an appointment by calling (714) 278-3013. The department requires that each student meet with an adviser at least once each year to ensure that degree requirements are being met.

## **How can I learn more?**

Additional information is available on the College of Engineering and Computer Science website at: [www.fullerton.edu/ecs](http://www.fullerton.edu/ecs), or e-mail us at: [ecsinfo@fullerton.edu](mailto:ecsinfo@fullerton.edu).

We encourage you to look us up on the Internet, however, we suggest that you also visit us in person. The department office is located in Engineering 100A.

You are also welcome to write to us at: Department of Electrical Engineering, California State University, Fullerton, P.O. Box 6870, Engineering 100A, Fullerton, CA 92834-6870. You can reach us at (714) 278-3013, or by FAX at: (714) 278-7162.

The most complete and authoritative information is found in the Department of Electrical Engineering Undergraduate Handbook. Contact us by e-mail, phone, FAX or mail to request your copy.