

Bachelor of Science in Computer Engineering

College of Engineering and Computer Science

Why major in computer engineering at Cal State Fullerton?

The Bachelor of Science in Computer Engineering at Cal State Fullerton provides students with a strong theoretical and practical background in computer hardware and software, along with the engineering analysis, design and implementation skills necessary to work successfully among many fields. The program emphasizes both breadth and depth across a range of computer engineering topics to provide a balanced view of hardware and software, hardware/software tradeoffs and basic modeling techniques used to represent the computing process. Topics integrated into the curriculum include algorithms, data structures, digital systems, computer organization and architecture, processor interfacing techniques, VHDL design, advanced electronics, software engineering, embedded systems, operating systems and database systems. This program is designed to develop an ability to apply design and analysis knowledge to the practice of computer engineering in an effective and professional manner.

Distinguished faculty. The College of Engineering and Computer Science supports high-quality teaching, learning and research by providing a well-equipped instructional environment and investing in student internships. Our faculty members are experienced professionals with diverse backgrounds, hold doctoral degrees from prestigious universities, and have active research programs in computer engineering, electrical engineering and computer science. Adjunct faculty, who bring students important knowledge of current practices and trends in computer engineering, supplement the full-time faculty members.

Preparation for graduate work. The Bachelor of Science degree in Computer 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 college includes funds to support undergraduate research. Several of our

undergraduate students have co-authored research papers with faculty members.

Industrial partnerships. The multidisciplinary senior design project, an innovative component of the Computer Engineering curriculum, allows students to work in project teams on professional design and development projects for clients from industry, government and the community. Partnerships with leading companies enable students and faculty to collaborate on funded projects of mutual interest with company engineers and scientists. Students gain invaluable practical experience and develop the skills necessary to work effectively in an interdisciplinary environment.

Accreditation. As a professional program, the Bachelor of Science degree in Computer Engineering will seek national accreditation from the Engineering Accreditation Commission (EAC) of the Accreditation Board for Engineering and Technology (ABET). As is customary in the field, ABET accreditation will be sought in the fall of 2008 after the first group of majors graduates from the program. 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. The program has been designed to meet current accreditation requirements.

What types of career opportunities are available?

Computer engineers are employed in a wide range of industries including VLSI chip design and manufacturing, autonomous systems, consumer electronics, expert systems, smart devices, computer manufacturing from PDAs (Personal Digital Assistants) to super computers, and automatic controls. A majority of products such as airplanes, automobiles, home appliances, consumer electronics and robotics use computers and employ computer engineers in their designs. Computer engineers are also needed in the design and implementation of computer networks for business, industrial and government institutions.

What courses are required?

All computer engineering majors take 34 units of foundation courses in mathematics and physical sciences, 30 units of general education courses, 53 units of required courses in computer science/computer engineering/electrical engineering/general engineering and 12 units of technical elective courses in computer science/computer engineering/electrical engineering for a total of 129 units.

Mathematics and Physical Science (34 units)

Mathematics 150A, 150B, 250A, 250 B and 270A; Physics 225 and 225L, 226 and 226L, 227 and 227L; Biology 101.

Required courses in Computer Science/Computer Engineering/Electrical Engineering (53 units)

- CPSC 131 Data Structures Concepts (3 units)
- CPSC 231 File System Concepts (3 units)
- CPSC 253U Workshop in UNIX (1 unit)

- CPSC 351 Operating Systems Concepts (3 units)
- EGCP 180 Digital Logic and Computer Structures (3 units)
- EGCP 280 Microcontrollers (3 units)
- EGCP 281 Designing with VHDL (2 units)
- EGCP 371 Modeling and Simulation of Signals and Systems (3 units)
- EGCP 381 Computer Design and Organization (4 units)
- EGCP 441 Advanced Electronics for Computer Engineers (4 units)
- EGCP 450 Embedded Processor Interfacing (4 units)
- EGCP 470 Multidisciplinary Projects in Computer Engineering I (1 unit)
- EGCP 471 Multidisciplinary Projects in Computer Engineering II (2 units)
- EGEE 203 Electric Circuits (3 units)
- EGEE 203L Electric Circuits Laboratory (1 unit)
- EGEE 303 Electronics (3 units)
- EGEE 303L Electronics Laboratory (1 unit)
- EGEE 323 Engineering Probability and Statistics (3 units)
- EGEE 370 Seminar in Electrical Engineering (1 unit)
- EGEE 406 Design Applications with Microcontrollers and FPGA (3 units)
- EGGN 314 Engineering Economy (2 units)

Technical Electives in Computer Engineering (12 units)

Students choose elective courses with the approval of their advisor from the following areas: Wireless Communication, Very Large Scale Integration (VLSI) and Optics, Control Systems and Systems Engineering, Microprocessors and Microcomputer Systems, Computer Networks, Global Positioning Systems (GPS), Software Engineering, Database System Design and Intelligent Systems.

General Education Courses (30 units)

Students complete 30 units in General Education courses to meet the following categories: Core Competencies, Historical and Cultural Foundations, Disciplinary Learning and Cultural Diversity. Specific courses to meet these requirements are listed under “General Education Requirements” in the on-line catalog http://www.fullerton.edu/catalog/academic_departments/eggn.asp.

Are there special programs or internships available?

Computer engineering majors may take advantage of the opportunities provided by the Center for Internships and Cooperative Education. 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 MESA Engineering Program (MEP) provides services that help educationally disadvantaged students achieve a high 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 Electronics Engineers (IEEE), Association for Computing Machinery (ACM), 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), and Tau Beta Pi Engineering Honor Society (TBP).

Who advises me?

The faculty members of the computer engineering program advise students. Students may make an appointment by calling (714) 278-3362. The program requires that each student meet with an advisor at least once each year to ensure that degree requirements are being met.

How can I learn more?

Additional information is available at our website: www.fullerton.edu/ecs. You are also welcome to send us an e-mail at: ecsinfo@fullerton.edu or visit us in person. Please call us at (714) 278 –3362 if you need an appointment or contact us by mail:

California State University, Fullerton
Computer Engineering Program
College of Engineering and Computer Science
800 N. State College Blvd., CS 502
P.O. Box 6870, Fullerton, CA 92834-6870
Phone: (714) 278 – 3362
Fax: (714) 278 - 7108