lected areas of fine arts, humanities, and social sciences. This outcome provides for the ability to understand the impact of engineering solutions in a global and societal context. A required course in engineering ethics will have prepared students for making professional contributions while maintaining institutional and individual integrity.

Undergraduate Program

Bachelor of Science—Computer Engineering

A minimum of 189 units is required for graduation. A complete list of requirements for the major can be found on page 48. Schedules should be planned to meet both General Education and major requirements.

The curriculum contains a core required of all computer engineers, a choice of at least 40 units of senior year elective courses including completion of two out of ten elective sequences and a senior year capstone design project.

Because the Computer Engineering degree program is conducted jointly by the Department of Computer Science and the Department of Electrical and Computer Engineering, several of the upper-division courses have equivalent versions offered by ECE or CMPSC. These courses are considered interchangeable, but only one such course of a given equivalent ECE/CMPSC pair may be taken for credit.

Courses required for the major, whether inside or outside of the Departments of Electrical and Computer Engineering or Computer Science, must be taken for letter grades. They cannot be taken for the passed/not passed grading option. The upper-division requirements consist of a set of required courses and a minimum of 40 units (10 classes) of additional departmental elective courses comprised of at least two sequences chosen from a set of eight specialty sequences. Each sequence must consist of two or more courses taken from the same course/sequence group. The department electives must also include a capstone design project (CMPSC 189A-B/ECE 189A-B). Upper-division courses required for the major are: Computer Science 130A, 170; ECE 152A, 154, 156A; either ECE 139 or PSTAT 120A; Engineering 101.

The defined sequences from which upper-division departmental electives may be chosen are:

- Computer Systems Design: ECE/CMPSC 153A, ECE 153B
- Computer Networks: ECE 155A/CMPSC 176A, ECE 155B/CMPSC 176B
- Distributed Systems: ECE 151/CMPSC 171 and one or both of the Computer Networks courses
- Programming Languages: CMPSC 160, 162
- Real-Time Computing & Control: ECE 147A-B, 157
- Multimedia: ECE 178, ECE/CMPSC 181B, ECE 160/CMPSC 182
- VLSI: ECE 124A, 124D
- Signal Processing: ECE 130A-B

Satisfactory Progress and Prerequisites

A majority of Computer Science and Electrical and Computer Engineering courses have prerequisites which must be completed successfully. Successful completion of prerequisite classes requires a grade of C or better in Mathematics 3A-B-C and a grade of C- or better in ECE classes. Students will not be permitted to take any ECE or CMPSC course if they received a grade of F in one or more of its prerequisites. Students who fail to maintain a grade-point average of at least 2.0 in the major may be denied the privilege of continuing in the major.

Computer Engineering Courses

See listings for Computer Science starting on page 25 and Electrical and Computer Engineering starting on page 30.

Computer Science

Department of Computer Science, Harold Frank Hall, Room 2104; Telephone (805) 893-4321
Web site: www.cs.ucsb.edu

Chair: Amubj Singh
Vice Chair: Elizabeth Belding

Faculty

Divyang Agrawal, Ph.D., State University of New York at Stony Brook, Professor (distributed systems and databases)

Kevin Almeroth, Ph.D., Georgia Institute of Technology, Professor (computer networks and protocols, large-scale multimedia systems, performance evaluation and distributed systems)

Elizabeth Belding, Ph.D., University of California, Santa Barbara, Professor (mobile wireless networking, network performance evaluation, advanced service support, solutions for developing and under-developed regions)

Tevfik Bultan, Ph.D., University of Maryland, College Park, Professor (web software and services, dependability, concurrency, automated verification, static analysis, software engineering)

Peter R. Cappello, Ph.D., Princeton University, Professor (JAVA/JAVAD-based parallel computing, multiprocessor scheduling, market-based resource allocation, self-directed learning)

Frederic T. Chong, Ph.D., Massachusetts Institute of Technology, Professor (computer architecture, novel computing technologies, quantum computing, embedded systems, and architectural support for system security and reliability)

Phillip Conrad, Ph.D., University of Delaware, Lecturer SOE (computer science education, web technologies, computer networks and communication, transport protocols, multimedia computing) 1

Ömer Egecioglu, Ph.D., University of California, San Diego, Professor (bijective and enumerative combinatorics, parallel algorithms, approximation algorithms, combinatorial algorithms)

Amr El Abbadi, Ph.D., Cornell University, Professor (Information and data management; distributed systems, cloud computing)

Diana Franklin, Ph.D., University of California, Davis, Lecturer SOE (computer architecture, architectural support for reliability, embedded systems, undergraduate teaching methods for diverse populations)

Frederic Gibou, Ph.D., University of California, Los Angeles, Professor (High resolution multiscale simulation, scientific computing, tools and software for computational science and engineering, engineering applications) 2