

BS Computer Engineering Program

The BS Computer Engineering program is jointly administered by the Computer Science and Engineering (CSE) and the Electrical and Computer Engineering (ECE) Departments.

The computer engineering lower division requirements are designed to provide a strong foundation in mathematics, physics, electrical engineering, programming methodology and skills, and computer organization. Upper division core courses deal with the theory and design of algorithms, hardware, and software as well as electronic systems. The program encompasses the study of hardware design, data storage, computer architecture, assembly languages, and the design of computers for engineering, information retrieval, and scientific research. Many graduates in this degree program go on to graduate school or choose careers that involve the design of computer hardware and software systems in diverse areas such as: computer graphics, computer-aided design, multimedia systems, databases, parallel computation, distributed computation, artificial intelligence, optical computing, very-large-scale-integration design, and fabrication.

Students should have sufficient background in high school mathematics so that they can take calculus in their first quarter. Courses in high school physics and computer programming, although helpful, are not required for admission to the program.

All major requirements and technical electives, except 197, 198 or 199, must be taken for a letter grade. To graduate, a grade point average of 2.0 is required in the upper division major requirements including the technical electives.

Requirements

Starting Fall 2007, the BS Computer Engineering program requires completion of a total of 152 units. The following sections on lower division, upper division and technical elective courses complete the requirements.

Four-Year Academic Plan

The CSE Department has established a Four-Year plan for students to follow. Each student must meet with their CSE Academic Advisor in their first quarter to put together a four-year plan.

Lower Division

Students are expected to complete the following courses by the end of their sophomore year.

- **Computer Science and Engineering:** CSE 91, CSE 8B* or CSE 11, CSE 12, CSE 15L, CSE 20 or Math 15A, CSE 21 or Math 15B, CSE 30 and CSE 70; 26 units.

*CSE 8A and CSE 8AL should be taken before 8B.

- **Mathematics:** Math 20A, 20B, 20C, 20D, and 20F; 20 units.
- **Physics:** Physics 2A, 2B, 2C, 2D; 16 units. Math 20A is a prerequisite for Physics 2A. Students whose performance on the Department of Mathematics placement test permits them to start with Math 20B or a higher course may take Physics 2A in the fall quarter of the freshman year; all others will take Physics 2A in the winter quarter of the freshman year. Students who received high grades

in both calculus and physics in high school may substitute the major's sequence, Physics 4A, 4B, 4C, 4E, for Physics 2A, 2B, 2C, 2D.

- **Introduction to Electrical Engineering:** ECE 35, ECE 45 and ECE 65; 12 units. These three courses give a comprehensive introduction to electrical engineering.
- **Probability and Statistics:** ECE 109; 4 units

Summary of Lower Division Major Requirements		
Area	Courses	Units
CSE	CSE 8B or CSE 11, CSE 12, CSE 15L, CSE 20 or Math 15A, CSE 21 or Math 15B, CSE 30, CSE 70, and CSE 91	28
ECE	ECE 35, ECE 45 and ECE 65	12
Math	Math 20A, 20B, 20C, 20D, 20F, and ECE 109	24
Physics	Physics 2A, 2B, 2C, and 2D.	16
Total Units	80	

Upper Division

All BS Computer Engineering students are required to take CSE 100 or Math 176, CSE 101 or Math 188, CSE 105 or Math 166, CSE 120, CSE 130, CSE 131, CSE 140, CSE 140L, CSE 141, and CSE 141L; 52 units. If students want to accelerate their program, they should consider taking CSE 100, CSE 105 or Math 166 and/or CSE 140 and CSE 140L in the sophomore year.

In addition, all BS Computer Engineering students have to fulfill the following upper division ECE requirements:

- **Linear Systems:** ECE 101; 4 units.
- **Electronic Circuits and Systems:** ECE 102, ECE 108; 8 units.

Summary of Upper Division Major Requirements		
Area	Courses	Units
Data Structures	CSE 100 or Math 176	4
Hardware	CSE 140, CSE 140L, CSE 141, CSE 141L	12
Computer Systems	CSE 120	4
Compilers	CSE 130, CSE 131	8
Algorithms and Theory	CSE 101 or Math 188, CSE 105 or Math 166	8
Linear Systems	ECE 101	4

Electronic Circuits	ECE 102, ECE 108	8
Technical Electives	6 courses	24
Total Units	48 Required + 24 Electives	72

Technical Electives

All BS Computer Engineering students are required to take six upper division technical electives for a total of 24 units. You must take either ECE 111 or ECE 118 to meet your technical elective design requirement. The remaining five technical electives may be either CSE or ECE upper division courses. You can also use a CSE or ECE graduate course for technical elective credit with approval. Once a CSE or ECE graduate course is used for an undergraduate degree that course may not be reused for a graduate degree. In addition, only 4 units of either a CSE 197, 198, or 199 may be used toward technical elective credit.

The remaining technical elective course can be any CSE or ECE upper division or graduate course, or any other course listed under the section titled Electives. This section also lists other restrictions in the selection of technical electives. If you want to deviate from this list of approved electives, you must petition with a CSE Academic Advisor.

Please note: You will not receive credit for Math 183 as technical elective credit after completing ECE 109.