

CpE UNDERGRADUATE PROGRAM

The Bachelor of Science degree in Computer Engineering is a four-year program that emphasizes engineering design of computer hardware and systems at all levels. Engineering design begins with logic design taught to entering students during their first semester. The thread of design continues through the study of architecture, CMOS and VLSI technology, ASIC design, operating systems, computer hardware design, and networking hardware. To complete their degree, students take a two-semester senior design and project course.

Students are expected to satisfy the general education requirements of the Accreditation Board for Engineering and Technology (ABET) as well as the University's General Education requirements. Students should consult the Program Coordinator for specific General Education requirements.

A second-year foreign language course (2A or equivalent) may also satisfy 3 units of GE when the course is being taken to comply with the CSUS foreign language requirement. Students should consult with an advisor for exact GE eligibility of these courses.

REQUIREMENTS - BACHELOR OF SCIENCE DEGREE

Units required for Major: 104

Minimum total units required for the BS: 137

Additional units may be required to meet the CSUS foreign language requirement.

Courses in parentheses are prerequisites.

A. Required Lower Division Courses (22 units)

- (4) CPE 064 Introduction to Logic Design (CSC 015 or CSC 025)
- (3) CSC 015 Programming Concepts and Methodology I (CSC 010 or programming experience)
- (3) CSC 020 Programming Concepts and Methodology II (CSC 015)
- (3) CSC 028 Discrete Structures for Computer Science (MATH 029; CSC 020, CSC 020 may be taken concurrently)
- (3) CSC 035 Introduction to Computer Architecture (CSC 015)
- (3) CSC 060 Introduction to Systems Programming in Unix (CSC 020, CSC 035)
- (3) ENGR 017 Introductory Circuit Analysis (PHYS 011C, MATH 045; either the math or physics may be taken concurrently, but not both)

B. Required Mathematics Courses (18 units)

- (4) MATH 030 Calculus I (MATH 029 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)
- (4) MATH 031 Calculus II (MATH 030 or appropriate high school based AP credit)
- (3) MATH 045 Differential Equations for Science and Engineering (MATH 031)
- (4) STAT 050 Introduction to Probability and Statistics (MATH 026A, MATH 030, or appropriate high school based AP credit)
- (3) MATH 100 Applied Linear Algebra (MATH 026B or MATH 031) **OR**
MATH 150 Introduction to Numerical Analysis (MATH 032 or MATH 045; some computer programming experience is desirable)

C. Additional Required Courses (16 units)

- (5) CHEM 001A General Chemistry I (High school algebra (two years) and high school chemistry; or equivalent)
- (3) ECON 1B Introduction to Microeconomic Analysis
- (4) PHYS 011A General Physics: Mechanics (MATH 030, MATH 031; or equivalent certificated high school courses. MATH 031 may be taken concurrently)
- (4) PHYS 011C General Physics: Electricity and Magnetism, Modern Physics (MATH 031, PHYS 011A)

D. Required Upper Division Courses (42 units)

- (3) CPE 138 Computer Networks and Internets (CSC 035, CSC 060, CSC 130)
- (3) CPE 142 Advanced Computer Organization (CPE 166, CPE 185)
- (3) CPE 151 CMOS and VLSI (CPE/EEE 064, EEE 102 or EEE 108)
- (3) CPE 159 Operating System Pragmatics (CSC 139)
- (4) CPE 166 Advanced Logic Design (CPE/EEE 064, ENGR 017)
- (4) CPE 185 Computer Interfacing (CPE/EEE 064, CSC 035, CSC 060)
- (3) CPE 186 Computer Hardware System Design (CPE 185 or EEE 174)
- (2) CPE 187 Embedded Processor System Design (CPE 166, CPE 185, EEE 102, passing score on the WPE)
- (2) CPE 190 Senior Design Project I (CPE 142, CPE 166, CPE 186, CPE 187 and passing score on the WPE)
- (2) CPE 191 Senior Design Project II (CPE 190)
- (3) CSC 130 Data Structures and Algorithm Analysis (CSC 020, CSC 028; CSC 028 may be taken concurrently)
- (3) CSC 139 Operating System Principles (CSC 060, CSC 137, or equivalent)
- (3) EEE 102 Analog/Digital Electronics (ENGR 017; Corequisite: EEE 102L)
- (1) EEE 102L Analog/Digital Electronics Lab (ENGR 017; Corequisite: EEE 102)
- (3) ENGR 181 Electronic Materials (CHEM 001A, PHYS 011A, MATH 045)

E. Technical Electives (6 units)

- (6) Select two from the following:
 - CPE 144 DSP Architecture Design (CPE 142)
 - CPE 153 VLSI Design (CPE 151)
 - CSC 131 Computer Software Engineering (CSC 130; may be taken concurrently)
 - CSC 133 Object-Oriented Computer Graphics Programming (CSC 130 and CSC 131)
 - CSC 134 Database Management and File Organization (CSC 130)
 - CSC 151 Compiler Construction (CSC 136)
 - CSC 155 Advanced Computer Graphics (CSC 133)
 - EEE 108 Electronics I (EEE 117, EEE 166; Corequisite: EEE 108L)
 - EEE 117 Network Analysis (ENGR 017, CPE/EEE 64; CPE/EEE 64 may be taken concurrently; (ENGR 017; Corequisite: EEE 117L)
 - EEE 180 Signals and Systems (EEE 117)
 - EEE 187 Robotics (EEE 180 or equivalent, or instructor permission)