COMPUTER ENGINEERING

Department of Computer Science and Engineering

Jack Brown Hall, Room 307
(909) 537-5326 **http://cse.csusb.edu/**

Department of Physics

Physical Sciences Building, Room 119
(909) 537-5397 **http://physics.csusb.edu/**

Bachelor of Science

Computer Engineering

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING FACULTY: Richard Botting, Arturo Concepcion, Paul Dixon, George Georgiou (Chair), Ernesto Gomez, Yasha Karant, Josephine Mendoza, Owen Murphy, Haiyan Qiao, Keith Schubert, David Turner, Tim Usher, Kerstin Voigt, Tong Yu, Kay Zemoudeh

DEPARTMENT OF PHYSICS FACULTY: Steven Barnes, Leo Connolly, Paul Dixon, Karen Kolehmainen, Susan Lederer, Paul Renteln (Chair), Javier Torner, Timothy Usher, Laura Woodney

Computer Engineering is a discipline with historical foundations in computer science and electrical engineering. It is concerned with the study of a variety of topics including circuit design, programmable logic, computer design, computer programming, software engineering, data communication, machine intelligence, robotics, the algorithmic solutions of problems, and the various representations of information including numeric, alphabetic, visual, audio and sensory. This discipline deals with effective ways to represent and manipulate information, algorithms to process information, hardware systems and technologies to run software, design methodologies for hardware and software systems, and engineering techniques for ensuring the accuracy and cost effectiveness of these processes.

The degree is jointly administered by the Department of Computer Science and Engineering and the Department of Physics. The program is housed in the Department of Computer Science and Engineering.

B.S. IN COMPUTER ENGINEERING

Requirements (135 units)

Total units required for graduation: 196

Requirements for the B.S. in Computer Engineering:

Lower-division requirements (71 units)

1. CHEM 215. General Chemistry (6)
2. CSCI 201. Computer Science I (4)
3. CSCI 202. Computer Science II (4)
4. ECON 200. Principles of Macroeconomics (4)
5. MATH 211. Basic Concepts of Calculus (4)
6. MATH 212. Calculus II (4)
7. MATH 213. Calculus III (4)
8. MATH 251. Multivariable Calculus I (4)
9. MATH 252. Multivariable Calculus II (4)
10. MATH 262. Applied Statistics (4)
11. MATH 272. Discrete Mathematics (4)
12. PHYS 150. Analog Electronics (5)
13. PHYS 152. Introduction to Engineering Design (2)
14. PHYS 221. General Physics I (5)
15. PHYS 222. General Physics II (5)
16. PHYS 223. General Physics III (5)
17. PHYS 224. General Physics IV (3)

Upper-division requirements (56 units)

1. CSCI 303. Computer Engineering Design (1) for a total of (7)
2. CSCI 310. Digital Logic (5)
3. CSCI 311. Advanced Digital Design (4)
4. CSCI 313. Machine Organization (4)
5. CSCI 330. Data Structures (4)
6. CSCI 401. Contemporary Computer Architectures (5)
7. CSCI 403. Circuit Design and Analysis (3)
8. CSCI 455. Software Engineering (4)
9. CSCI 460. Operating Systems (4)
10. CSCI 535. Numerical Computation (4)
11. PHYS 318. Materials Science and Engineering (4)
12. PHYS 350. Data Acquisition and Control (4)
13. PHYS 373. Mathematical Methods of Physics (4)

Specialization (8 units)

Take both courses in one specialization for a total of eight units.

Networking

1. CSCI 530. Data Communication and Networks (4)
2. CSCI 531. High Performance Networks (4)

Embedded Systems

1. CSCI 510. Advanced Computer Architecture (4)
2. CSCI 521. Field Programmable Gate Array Design (4)

Computer Systems

1. CSCI 350. File Systems (4)
2. CSCI 570. Compilers (4)

Software Engineering

1. CSCI 556. Introduction to Formal Methods, Models and Languages (4)
2. CSCI 565. Systems Programming (4)

DEPARTMENTAL HONORS IN COMPUTER ENGINEERING

The department faculty will determine whether a student is to be awarded departmental honors based upon the following criteria:

1. Demonstration of independent work by achieving a grade of "C" or better (2.0) in any one of the following:
   a. CSCI 575. Internship in Computer Science (4)
   b. CSCI 595. Independent Study (4)
   c. PHYS 585. Internship in Physics (4)
   d. PHYS 595. Independent Study (4)
2. Attainment of a minimum overall grade point average of 3.0 ("B") in all university courses attempted and a minimum grade point average of 3.5 in all computer science courses required by the major.
3. At least five upper-division computer engineering courses required by the major must be taken at this university.

Candidacy for honors in computer engineering is voluntary and must be applied for at the beginning of the senior year. Approval of honors rests solely with the department and other factors may weigh in their judgment.