B.S. in Computer and Electrical Engineering

Computer engineering and electrical engineering involve the design and prototyping of complex electrical and electronic devices and systems. The field of computer and electrical engineering encompasses a wide range of topics in computing where hardware plays an important role.

Degree Programs
The Computer Engineering major has two concentrations: Computer Engineering and Electrical Engineering. Computer Engineering began in Fall 2011 and Electrical Engineering began in Fall 2012.

The Computer and Electrical Engineering degrees follow the degree guidelines formulated by the Institute of Electrical and Electronics Engineers (IEEE) and the Accreditation Board for Engineering and Technology (ABET).

State-of-the-Art Facilities
Our department is located on the third floor of the spacious and modern Science III building. Here you will find our world-class Robotics Laboratory, home to a fascinating variety of high-tech robots, and the Computer Perception Laboratory, equipped with the latest image processing and AI technology. We also have an advanced graphics workstation laboratory, a circuit laboratory, a digital signal processing laboratory, a power systems and electronics laboratory, a cyber security laboratory, and several well-equipped instructional laboratories.

We also administer our own local network, which includes multiple Linux servers and an isolated network, and maintain all of our laboratories. There is also a department study room and tutoring center dedicated to student academic support.

Career Opportunities
A degree in Computer or Electrical Engineering from CSUB is the first step to any number of innovative and rewarding careers. Graduates go on to work in a number of fields, including:

- Embedded Systems
- Robotics
- Semiconductors
- Digital Signal Processing
- Control Systems
- Image Processing

Faculty
- Melissa Danforth (Chair) Ph.D., CS, University of California, Davis
- Huaqing Wang Ph.D., CS, Case Western Reserve University
- Wei Li Ph.D., ECE, University of Saarland
- Saeed Jafarzadeh Ph.D., EE, University of Nevada-Reno
- Vida Vakilian Ph.D., EE, University of Montreal
- Albert Cruz Ph.D., EE, University of California, Riverside
- Reza Abdolee Ph.D., ECE, McGill University
- Anthony Bianchi Ph.D., EE, University of California, Riverside
- Chengwei Lei Ph.D., CS, University of Texas, San Antonio
- Antonio Cardenas Ph.D., CS, Arizona State University
- Ehsan Rehmani Ph.D., EE, University of Hawaii
- Gordon Griesel MBA, B.S., CS, CSU Bakersfield
- Derrick McKee B.S., CS, CSU Bakersfield
At CSUB, we offer Bachelor of Science degrees in Computer Engineering and Electrical Engineering

**Bachelor of Science (B.S.)**
Computer Engineering

**Lower Division Core Courses:**
- ECE/ENGR 1618 Intro. to Engineering I (2)
- ECE/ENGR 1628 Intro. to Engineering II (2)
- CMPS 2010 Prog. Fundamentals (4)
- CMPS 2020 Data Structures and Alg. (4)
- CMPS 2120 Discrete Structures (4)
- ECE/ENGR/PHYS 2070 Electric Circuits (4)

**Upper Division Core Courses:**
- CMPS 3240 Comp. Arch.II: Organization (4)
- CMPS 3650 Operating Systems (4)
- ECE 3040 Signals and Systems (4)
- ECE 3070 Analog Circuits (4)
- ECE 3200 Digital Circuits (4)
- ECE 4100 Senior Project I (2)
- ECE 4910 Senior Project I (2)

**Upper Division Electives Courses:**
- Choose three courses from
  - ECE 3220 Digital Design with VHDL
  - ECE 3250 Embedded Systems
  - ECE 3280 Instr., Control, and Data Acquis.
  - ECE 4220 Digital Signal Processing
  - ECE 4240 Microprocessor System Design
  - ECE 4250 Wireless Communications
  - ECE 4260 Wireless Networks
  - ECE 4460 Image Processing
  - ECE 4470 Computer Vision
  - ECE 4570 Robotics

Some Special Topics and Independent Study courses can substitute for one elective course (see side bar).

**Cognate Courses:**
- MATH 2310 or 2510 Calculus I (4)
- MATH 2320 or 2520 Calculus II (4)
- MATH 2530 Calculus III (4)
- MATH 2810 Linear Algebra (4)
- MATH 3000 Probability Theory (4)
- PHYS 2210 Classical Physics I (4)
- PHYS 2220 Classical Physics II (4)
- PHIL 3318 Professional Ethics (3)

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**Bachelor of Science (B.S.)**
Electrical Engineering

**Lower Division Core Courses:**
- ECE/ENGR 1618 Intro. to Engineering I (2)
- ECE/ENGR 1628 Intro. to Engineering II (2)
- CMPS 2010 Prog. Fundamentals (4)
- ECE/ENGR/PHYS 2070 Electric Circuits (4)

**Upper Division Core Courses:**
- ECE 3040 Signals and Systems (4)
- ECE 3170 Analog Circuits (4)
- ECE 3200 Digital Circuits (4)
- ECE 3230 Digital Communications (4)
- ECE 3230 Fields and Waves (4)
- ECE 3340 Control Systems (4)
- ECE 3370 Power System Fund. (4)
- ECE 4910 Senior Project I (2)
- ECE 4928 Senior Project I (2)

**Upper Division Elective Courses:**
- Choose three courses from
  - ECE 3220 Digital Design with VHDL
  - ECE 3250 Embedded Systems
  - ECE 3280 Instr., Control, and Data Acquis.
  - ECE 3380 Power Elect. and Elect. Drives
  - ECE 4220 Digital Signal Processing
  - ECE 4240 Microprocessor System Design
  - ECE 4250 Wireless Communications
  - ECE 4260 Wireless Networks
  - ECE 4330 Mechatronics
  - ECE 4370 Power Systems Analysis
  - ECE 4460 Image Processing
  - ECE 4470 Computer Vision
  - ECE 4570 Robotics

Some Special Topics and Independent Study courses can substitute for one elective course (see side bar).

**Cognate Courses:**
- CHEM 1000 General Chemistry (3)
- MATH 2310 or 2510 Calculus I (4)
- MATH 2320 or 2520 Calculus II (4)
- MATH 2530 Calculus III (4)
- MATH 2810 Linear Algebra (4)
- MATH 3000 Probability Theory (4)
- PHYS 2210 Classical Physics I (4)
- PHYS 2220 Classical Physics II (4)
- PHIL 3318 Professional Ethics (3)

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**General Education Requirements for Engineering Programs**

**Lower Division General Education Requirements:**
- A1 – COMM 1008 (3)
- A2 – ENGL 1109 (3)
- A3 – Waived for Elect. and Comp. Eng. majors
- A4 – Satisfied by MATH 2310
- B1/B3 – Satisfied by PHYS 2210
- B2/B3 – Waived for Elect. and Comp. Eng. majors
- C1 – Arts (3)
- C2 – Humanities (3)
- US History for American Institutions requirement (3)
- Government for American Institutions requirement (3)
- Area D (1st course) – ECON 2018 or 2028 (3)
- Area D (2nd course) – Waived for Elect. & Comp. Eng. majors
- SELF – Recommend taking course that double-counts for another GE requirement (0-3)

**Upper Division General Education Requirements:**
- Junior Year Diversity Reflection (JYDR) (3)
- UD Area B – Not required for NSME majors
- UD Area C – Satisfied by PHIL 3318
- UD Area D – Waived for Comp. & Elec. Eng. majors
- Capstone – Satisfied by ECE 4928
- GWAR – Pass exam or get C or better in course

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**Special Topics and Independent Study**
Elective Courses in Computer and Electrical Engineering:

- ECE 3770 Special Topics in Engineering
- ECE 3771 Special Topics Laboratory
- ECE 4770 Special Topics in Engineering
- ECE 4771 Special Topics Laboratory
- ECE 4800 Undergraduate Research
- ECE 4860 Internship
- ECE 4870 Cooperative Education
- ECE 4890 Experiential Prior Learning

*Only a combined total of 4 units of these courses may be used for elective credit in the degree program.*