

ELECTRICAL/ELECTRONIC ENGINEERING BS

More Information

Advising Requirement

Advising is mandatory for this program. Consult your department advisor or program coordinator for information.

E-advising Tools

Students are encouraged to use the interactive e-advising tools that have been designed to help them graduate within four years. These tools can be accessed through the Student Center.

Graduates of the Bachelor of Science in Electrical/Electronic Engineering are qualified for professional practice or graduate work in several areas of specialization including autonomous control system design, power systems, machine learning, and wired, wireless, and optical communication systems. In addition to fundamentals of science and mathematics, the program provides a solid background in analog and digital electronics, microprocessors, and digital signal. The curriculum offers flexibility for electrical/electronic engineering students to select whether they would like to delve deeper into

- the design of advanced analog electronics or control systems;
- communication systems or electromagnetics and antenna design;
- applications of machine learning in bioimaging systems or image processing;
- advanced digital electronics with field-programmable gate arrays (FPGAs) or the design and fabrication of very large-scale integration (VLSI) digital circuits; and
- the design and control electric generators and motors or to design systems to distribute electricity from power plants to the home.

The job outlook for electrical/electronic engineers is very bright and there is a growing demand for electrical/electronic engineers by both industry and government. However, the number of students enrolled in electrical/electronic engineering degree programs in the US has not kept up, resulting in the current shortage of electrical/electronic engineers. The need for electrical/electronic engineers is expected to continue for decades as the US strives to maintain its lead in high-tech innovations, takes actions to address climate change, and invests in improvements in the quality of life of its residents and people across the globe. Hence, there is a critical need for electrical/electronic engineers who can design alternative energy systems, advanced communication systems such as 6G (and beyond), electric vehicles, advanced biomedical imaging systems and biosensors, and intelligent robotic systems for use in industrial and consumer products. Our California State University, Chico electrical/electronic engineering students will be able to address this need.

With their technical electives, students can explore these fields further, investigate other areas of electrical/electronic engineering, or receive credit for internships in the field.

The Electrical/Electronic Engineering program is accredited by the Engineering Accreditation Commission (EAC) of ABET, <http://www.abet.org>.

Electrical/Electronic Engineering Program Mission

The Electrical and Computer Engineering Department educates each student to be a responsible and productive electrical/electronic engineer who can effectively respond to future challenges.

Electrical/Electronic Engineering Program Objectives

Program educational objectives describe the career and professional accomplishments that the program strives to prepare its graduates to achieve within five years. The electrical/electronic engineering program prepares its graduates to

- Contribute to solutions of engineering problems by applying their technical knowledge, their experience with modern industry tools, and their understanding of the impact that engineering can have on global, societal, and environmental issues.
- Assume project/product management and team leadership roles in their organizations.
- Engage in activities that sustain and promote their careers by securing professional licenses, completing graduate courses and/or degree programs, and/or pursuing informal learning opportunities.
- Contribute to society through involvement in professional and/or service activities.

Electrical/Electronic Engineering Student Outcomes

Electrical/Electronic engineering graduates should have the ability to

1. Identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. Communicate effectively with a range of audiences.
4. Recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. Function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. Acquire and apply new knowledge as needed, using appropriate learning strategies.

Electrical/Electronic Engineering Design Experience

Design and innovation are fundamental aspects of the electrical/electronic engineering curriculum, and they are integrated into the curriculum beginning in the freshman year where students are introduced to both hardware and software design. As students expand their knowledge and analysis skills through the sophomore and junior years, they design increasingly complex projects and gain experience

through developing their own unique solutions to design challenges in all of the major areas of electrical/electronic engineering.

The design experience culminates in the senior year when each student proposes their own capstone project, creates target specifications for the project using industry-standard procedures, models and simulates the operation of their project, and then constructs and characterizes their project to prove the envisioned design functions. Descriptions of recent student capstone projects can be found on the Electrical Engineering and Computer Engineering Department website (<http://www.csuchico.edu/eece/index.shtml/>).

Grading Requirement

All courses taken to fulfill program course requirements must be taken for a letter grade except those courses specified by the department as credit/no credit grading only.

All students must attain a 2.0 Grade Point Average (GPA) in all college courses attempted and for all courses attempted at California State University, Chico. Electrical/Electronic Engineering majors must also attain a 2.0 GPA in:

1. All courses required for the major, and
2. All Electrical Engineering and Computer Engineering (EECE) courses taken to meet major requirements at Chico State.

Complete EECE 144, EECE 211, and EECE 237 with a grade of C- or higher.

Enrollment in any mathematics course requires a grade of C- or higher in all prerequisite courses or their transfer equivalents.

Course Requirements for the Major: 100 units

Completion of the following courses, or their approved transfer equivalents, is required of all candidates for this degree. Courses in this program may complete more than one graduation requirement.

Course	Title	Units
Lower Division		
CSCI 111	Programming and Algorithms I	4
EECE 101	Exploration of Electrical and Computer Engineering	2
EECE 144	Logic Design Fundamentals	4
EECE 211	Linear Circuits I	3
EECE 211L	Linear Circuits I Activity	1
EECE 237	Embedded Systems Development	3
MATH 120	Analytic Geometry and Calculus	4
MATH 121	Analytic Geometry and Calculus	4
MATH 220	Analytic Geometry and Calculus	4
MATH 260	Elementary Differential Equations	4
PHYS 204A	Physics for Students of Science and Engineering: Mechanics	4
PHYS 204B	Physics for Students of Science and Engineering: Electricity and Magnetism	4
Select one of the following:		4
CHEM 111	General Chemistry I	
EECE 314 & 314L	Bioinstrumentation and Bioinstrumentation Activity	

Upper Division

EECE 311	Linear Circuits II	4
EECE 315	Electronics I	4
EECE 344	Digital Systems Design	4
EECE 365	Signals, Systems, and Transforms	4
EECE 490AW	Engineering Profession and Design (W)	4
EECE 490B	Engineering Economics and Project Implementation	4
MATH 314	Probability and Statistics for Science and Technology	4
Select one of the following:		4
EECE 481	Electromechanical Conversion	
EECE 483	Power Systems Operation	
Select one of the following:		4
EECE 316	Electronics II	
EECE 482	Control System Design	
Select one of the following:		4
EECE 343	Computer Architecture Performance and Implementation	
EECE 416	CMOS Digital Integrated Circuits Design	
Select two of the following:		8
EECE 465	Digital Signal Processing	
EECE 565	Bioimaging Systems	
EECE 566	Applied Digital Image Processing	
Select seven units from the following:		7
Select one of the following:		
EECE 375	Fields and Waves	
EECE 453	Communication Systems Design	
Select three to four units from the following:		
Any approved upper-division Electrical Engineering and Computer Engineering (EECE) courses not otherwise required for graduation.		
Select sufficient upper-division units to ensure 100 units in the major.		
Total Units		100

Honors in the Major

Honors in the Major is a program of independent work in your major. It requires six units of honors coursework completed over two semesters.

The Honors in the Major program allows you to work closely with a faculty mentor in your area of interest on an original performance or research project. This year-long collaboration allows you to work in your field at a professional level and culminates in a public presentation of your work. Students sometimes take their projects beyond the University for submission in professional journals, presentation at conferences, or academic competition. Such experience is valuable for graduate school and professional life. Your honors work will be recognized at your graduation, on your permanent transcripts, and on your diploma. It is often accompanied by letters of commendation from your mentor in the department or the department chair.

Some common features of Honors in the Major program are:

- You must take six units of Honors in the Major coursework. All six units are honors courses (marked by a suffix of H), and at least three of these units are independent study (399H, 499H, 599H) as specified

by your department. You must complete each course with a minimum grade of B.

- You must have completed 9 units of upper-division coursework or 21 overall units in your major before you can be admitted to Honors in the Major. Check the requirements for your major carefully, as there may be specific courses that must be included in these units.
- Your cumulative GPA should be at least 3.5 or within the top 5% of majors in your department.
- Your GPA in your major should be at least 3.5 or within the top 5% of majors in your department.
- Most students apply for or are invited to participate in Honors in the Major during the second semester of their junior year. Then they complete the six units of coursework over the two semesters of their senior year.
- Your honors work culminates with a public presentation of your honors project.

While Honors in the Major is part of the Honors Program, each department administers its own program. Please contact your major department or major advisor to apply.

See Bachelor's Degree Requirements (<https://catalog.csuchico.edu/undergraduate-requirements/bachelors-degree-requirements/>) for complete details on general degree requirements. A minimum of 39 units, including those required for the major, must be upper division.

General Education Requirements: 48 units

See General Education (<https://catalog.csuchico.edu/colleges-departments/undergraduate-education/general-education/>) and the Class Schedule (<http://www.csuchico.edu/schedule/>) for the most current information on General Education Requirements and course offerings.

This major has approved GE modification(s). See below for information on how to apply these modification(s).

- Take CMST 131 for Oral Communication (A1).
- Take ENGL 130W for Written Communication (A2).
- Critical Thinking (A3) is waived (<https://www.calstate.edu/attend/student-services/casper/Pages/high-unit-majors.aspx>).
- Take only one course in either Arts (C1) or Humanities (C2). The other is waived.
- EECE 490B is an approved major course substitution for Social Sciences (D).
- EECE 490AW is an approved major course substitution for Lifelong Learning and Self-Development (E).
- EECE 311 fulfills Upper-Division Scientific Inquiry and Quantitative Reasoning (UD-B).

Diversity Course Requirements: 6 units

You must complete a minimum of two courses that focus primarily on cultural diversity. At least one course must be in US Diversity (USD) and at least one in Global Cultures (GC). See Diversity Requirements (<https://catalog.csuchico.edu/undergraduate-requirements/diversity-requirements/>) for a full list of courses. Most courses taken to satisfy these requirements may also apply to General Education (<https://catalog.csuchico.edu/colleges-departments/undergraduate-education/general-education/>).

Upper-Division Writing Requirement

Writing Across the Curriculum (EM 17-009 (<http://www.csuchico.edu/prs/EMs/2017/17-009.shtml/>)) is a graduation requirement and may be demonstrated through satisfactory completion of four Writing (W) courses, two of which are designated by the major department. See Mathematics/Quantitative Reasoning and Writing Requirements (<https://catalog.csuchico.edu/undergraduate-requirements/mathematicsquantitative-reasoning-writing-requirements/>) for more details on the four courses. The first of the major designated Writing (W) courses is listed below.

- Any upper-division Writing (W) course.

The second major-designated Writing course is the Graduation Writing Assessment Requirement (GW) (EO 665 (<https://calstate.policystat.com/policy/9585618/latest/>)). Students must earn a C- or higher to receive GW credit. The GE Written Communication (A2) (<https://catalog.csuchico.edu/colleges-departments/undergraduate-education/general-education/#A2>) requirement must be completed before a student is permitted to register for a GW course.