BS ELECTRICAL ENGINEERING

Program Learning Outcomes

Electrical engineering students are expected to graduate with:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to 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. An ability to communicate effectively with a range of audiences.
4. An ability to 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. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Degree Requirements and Curriculum

In addition to the program requirements listed on this page, students must also satisfy requirements outlined in more detail in the Minimum Requirements for Graduation (https://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext) section of this catalog, including:

- 60 units of upper-division courses
- Graduation Writing Requirement (GWR)
- 2.0 GPA
- U.S. Cultural Pluralism (USCP)

Note: No Major or Support courses may be selected as credit/no credit.

MAJOR COURSES

CPE/EE 133	Digital Design	4
CPE/EE 233	Computer Design and Assembly Language Programming	4
EE 111 & EE 151	Introduction to Electrical Engineering and Introduction to Electrical Engineering Laboratory	2
Select from the following:		
EE 113 & EE 143	Electric Circuit Analysis I and Electronics Manufacturing and Circuit Analysis Laboratory	4
or		
EE 112 & IME 156	Electric Circuit Analysis I and Basic Electronics Manufacturing	
EE 211 & EE 241	Electric Circuit Analysis II and Electric Circuit Analysis Laboratory II	4
EE 212 & EE 242	Electric Circuit Analysis III and Electric Circuit Analysis Laboratory III	4
EE 228	Continuous-Time Signals and Systems	4
EE 255 & EE 295	Energy Conversion Electromagnetics and Energy Conversion Electromagnetics Laboratory	4
EE 302 & EE 342	Classical Control Systems and Classical Control Systems Laboratory	4
EE 306 & EE 346	Semiconductor Device Electronics and Semiconductor Device Electronics Laboratory	4
EE 307 & EE 347	Digital Electronics and Integrated Circuits and Digital Electronics and Integrated Circuits Laboratory	4
EE 308 & EE 348	Analog Electronics and Integrated Circuits and Analog Electronics and Integrated Circuits Laboratory	4
EE 314	Introduction to Communication Systems	3
EE 328 & EE 368	Discrete Time Signals and Systems and Signals and Systems Laboratory	4
EE/CPE 329	Microcontroller-Based Systems Design	4
or EE 336	Microprocessor System Design	
EE 335	Electromagnetic Fields and Transmission	4
EE 375	Electromagnetic Fields and Transmission Laboratory	1
EE 402	Electromagnetic Waves	4
EE 409 & EE 449	Electronic Design and Electronic Design Laboratory	4
EE 460	Senior Project Preparation [1]	2
Select from the following: [1]		4
EE 461 & EE 462	Senior Project I and Senior Project II	
or		
EE 463 & EE 464	Senior Project Design Laboratory I and Senior Project Design Laboratory II	

SUPPORT COURSES

BIO 213 & BMED 213	Life Science for Engineers and Bioengineering Fundamentals (B2) [2]	4
CHEM 124	General Chemistry for Physical Science and Engineering I (B1 & B3) [2]	4
CSC/CPE 101	Fundamentals of Computer Science	4
MATH 141	Calculus I (B4) [2]	4
MATH 142	Calculus II (B4) [2]	4
MATH 143	Calculus III (Area B Electives) [2]	4
MATH 241	Calculus IV	4
MATH 244	Linear Analysis I	4

PHYS 141	General Physics I (Area B Electives) [2]	4
PHYS 142	General Physics II	4
PHYS 143	General Physics III	4
PHYS 211	Modern Physics I	4
STAT 350	Probability and Random Processes for Engineers (Upper-Division B) [2]	4
Concentration or General Curriculum in Electrical Engineering [3]		
(See list of Concentrations and General Curriculum in Electrical Engineering below)		20
GENERAL EDUCATION (GE)		
(See GE program requirements below.)		44
FREE ELECTIVES		
Free Electives		0
Total units		**192**

1. Either the ENGR 459, ENGR 460 and ENGR 461 (6) series or the ENGR 463, ENGR 464 and ENGR 465 (6) series may substitute for the EE 460, EE 461 and EE 462 (6) series or the EE 460, EE 463 and EE 464 (6) series.
2. Required in Major or Support; also satisfies General Education (GE) requirement.
3. Unless a concentration is declared, the default will be General Curriculum in Electrical Engineering.

General Curriculum in Electrical Engineering or Concentrations (Select one)

- General Curriculum in Electrical Engineering (https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/electricalengineering/bselectricalengineering/general-curriculum-in-electrical-engineering/)
- Power (https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/electricalengineering/bselectricalengineering/power-concentration/)
- Radio Frequency - Microwaves - Photonics (https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/electricalengineering/bselectricalengineering/radio-frequency-microwaves-photonics-concentration/)
- Systems (https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/electricalengineering/bselectricalengineering/systems-concentration/)

General Education (GE) Requirements

- 72 units required, 28 of which are specified in Major and/or Support.
- If any of the remaining 44 units is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- See the complete GE course listing (https://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext).
- A grade of C- or better is required in one course in each of the following GE Areas: A1 (Oral Communication), A2 (Written Communication), A3 (Critical Thinking), and B4 (Mathematics/Quantitative Reasoning).

Area A	**English Language Communication and Critical Thinking**	
A1	Oral Communication	4
A2	Written Communication	4
A3	Critical Thinking	4
Area B	**Scientific Inquiry and Quantitative Reasoning**	
B1	Physical Science (4 units in Support) [1]	0
B2	Life Science (4 units in Support) [1]	0
B3	One lab taken with either a B1 or B2 course	
B4	Mathematics/Quantitative Reasoning (8 units in Support) [1]	0
Upper-Division B (4 units in Support) [1]		0
Area B Electives (8 units in Support) [1]		0
Area C	**Arts and Humanities**	
Lower-division courses in Area C must come from three different subject prefixes.		
C1	Arts: Arts, Cinema, Dance, Music, Theater	4
C2	Humanities: Literature, Philosophy, Languages other than English	4
Lower-Division C Elective - Select a course from either C1 or C2.		4
Upper-Division C		4
Area D	**Social Sciences**	
D1	American Institutions (Title 5, Section 40404 Requirement)	4
Area D Elective - Select either a lower-division D2 or upper-division D course.		4
Area E	**Lifelong Learning and Self-Development**	
Lower-Division E		4
Area F	**Ethnic Studies**	
F	Ethnic Studies	4
Total units		**44**

1. Required in Major or Support; also satisfies General Education (GE) requirement.