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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPE/EE 133</td>
<td>Digital Design</td>
<td>4</td>
</tr>
<tr>
<td>CPE/EE 233</td>
<td>Computer Design and Assembly Language Programming</td>
<td>4</td>
</tr>
<tr>
<td>EE 111</td>
<td>Introduction to Electrical Engineering and Introduction to Electrical Engineering Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>EE 111 &amp; EE 151</td>
<td>Introduction to Electrical Engineering and Introduction to Electrical Engineering Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>EE 113 &amp; EE 143</td>
<td>Electric Circuit Analysis I and Electronics Manufacturing and Circuit Analysis Laboratory</td>
<td>4</td>
</tr>
<tr>
<td>EE 211 &amp; EE 241</td>
<td>Electric Circuit Analysis II and Electric Circuit Analysis Laboratory II</td>
<td>4</td>
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</tbody>
</table>

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     |
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 | 2     |

Select from the following:

EE 461 & EE 462 | Senior Project I and Senior Project II | 4     |

EE 463 & EE 464 | Senior Project Design Laboratory I and Senior Project Design Laboratory II | 4     |

SUPPORT COURSES

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 213 &amp; BMED 213</td>
<td>Life Science for Engineers and Bioengineering Fundamentals (B2)</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 124</td>
<td>General Chemistry for Physical Science and Engineering I (B1 &amp; B3)</td>
<td>2</td>
</tr>
<tr>
<td>CSC/CPE 101</td>
<td>Fundamentals of Computer Science</td>
<td>4</td>
</tr>
<tr>
<td>MATH 141</td>
<td>Calculus I (B4)</td>
<td>2</td>
</tr>
<tr>
<td>MATH 142 &amp; MATH 143</td>
<td>Calculus II (B4) and Calculus III (Area B Electives)</td>
<td>2</td>
</tr>
<tr>
<td>MATH 241</td>
<td>Calculus IV</td>
<td>4</td>
</tr>
<tr>
<td>MATH 244</td>
<td>Linear Analysis I</td>
<td>4</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Units</td>
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</tr>
<tr>
<td>PHYS 141</td>
<td>General Physics I (Area B Electives)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 142</td>
<td>General Physics II</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 143</td>
<td>General Physics III</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>Modern Physics I</td>
<td>4</td>
</tr>
<tr>
<td>STAT 350</td>
<td>Probability and Random Processes</td>
<td>4</td>
</tr>
</tbody>
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**Concentration or General Curriculum in Electrical Engineering** (3 units)

(See list of Concentrations and General Curriculum in Electrical Engineering below)

**GENERAL EDUCATION (GE)**

(See GE program requirements below.)

**FREE ELECTIVES**

Free Electives: 0 units

**Total units:** 192

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### General Curriculum in Electrical Engineering or Concentrations (Select one)

- General Curriculum in Electrical Engineering (https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/electricalengineering/bseelectricalengineering/general-curriculum-in-electrical-engineering/)
- Power (https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/electricalengineering/bseelectricalengineering/power-concentration/)
- Systems (https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/electricalengineering/bseelectricalengineering/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 units
- A2 Written Communication: 4 units
- A3 Critical Thinking: 4 units

### Area B

**Scientific Inquiry and Quantitative Reasoning**

- B1 Physical Science (4 units in Support): 0 units
- B2 Life Science (4 units in Support): 0 units
- B3 One lab taken with either a B1 or B2 course
- B4 Mathematics/Quantitative Reasoning (8 units in Support): 0 units

Upper-Division B (4 units in Support): 0 units

Area B Electives (8 units in Support): 0 units

### 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 units
- C2 Humanities: Literature, Philosophy, Languages other than English: 4 units

Lower-Division C Elective - Select a course from either C1 or C2:

Upper-Division C: 4 units

### Area D

**Social Sciences**

- D1 American Institutions (Title 5, Section 40404 Requirement): 4 units

Area D Elective - Select either a lower-division D2 or upper-division D course:

### Area E

**Lifelong Learning and Self-Development**

### Area F

**Ethnic Studies**

F Ethnic Studies: 4 units

**Total units:** 44

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