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 (http://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 Programming</td>
<td>4</td>
</tr>
<tr>
<td>EE 111</td>
<td>Introduction to Electrical Engineering and Design</td>
<td>2</td>
</tr>
<tr>
<td>&amp; EE 151</td>
<td>and Introduction to Electrical Engineering Laboratory</td>
<td></td>
</tr>
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</table>

Select from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 113</td>
<td>Electric Circuit Analysis I and Electronics Manufacturing</td>
<td>4</td>
</tr>
<tr>
<td>&amp; EE 143</td>
<td>and Circuit Analysis Laboratory</td>
<td></td>
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<tr>
<td>or</td>
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<td></td>
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<tr>
<td>EE 112 &amp; IME 156</td>
<td>Electric Circuit Analysis I and Basic Electronics Manufacturing</td>
<td>4</td>
</tr>
</tbody>
</table>

EE 211 & EE 241 Electric Circuit Analysis II and Electric Circuit Analysis Laboratory II

EE 212 & EE 242 Electric Circuit Analysis III and Electric Circuit Analysis Laboratory III

EE 228 Continuous-Time Signals and Systems

EE 255 & EE 295 Energy Conversion Electromagnetics and Energy Conversion Electromagnetics Laboratory

EE 302 & EE 342 Classical Control Systems and Classical Control Systems Laboratory

EE 306 & EE 346 Semiconductor Device Electronics and Semiconductor Device Electronics Laboratory

EE 307 & EE 347 Digital Electronics and Integrated Circuits and Digital Electronics and Integrated Circuits Laboratory

EE 308 & EE 348 Analog Electronics and Integrated Circuits and Analog Electronics and Integrated Circuits Laboratory

EE 314 Introduction to Communication Systems

EE 328 & EE 368 Discrete Time Signals and Systems and Signals and Systems Laboratory

EE/CPE 329 Microcontroller-Based Systems Design

or EE 336 Microprocessor System Design

EE 335 Electromagnetic Fields and Transmission

EE 375 Electromagnetic Fields and Transmission Laboratory

EE 402 Electromagnetic Waves

EE 409 Electronic Design

& EE 449 and Electronic Design Laboratory

EE 460 Senior Project Preparation

Select from the following:

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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 213</td>
<td>Life Science for Engineers and Bioengineering Fundamentals (B2)</td>
<td>4</td>
</tr>
<tr>
<td>&amp; BMED 213</td>
<td>and Bioengineering Fundamentals (B2)</td>
<td></td>
</tr>
<tr>
<td>CHEM 124</td>
<td>General Chemistry for Physical Science and Engineering I (B1 &amp; B3)</td>
<td>4</td>
</tr>
<tr>
<td>CSC/CPE 101</td>
<td>Fundamentals of Computer Science</td>
<td></td>
</tr>
<tr>
<td>MATH 141</td>
<td>Calculus I (B4)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 142</td>
<td>Calculus II (B4)</td>
<td>4</td>
</tr>
<tr>
<td>MATH 143</td>
<td>Calculus III (Area B Electives)</td>
<td>4</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>
</tbody>
</table>
PHYS 141  General Physics IA (Area B Electives)  4
PHYS 132  General Physics II  4
PHYS 133  General Physics III  4
PHYS 211  Modern Physics I  4
STAT 350  Probability and Random Processes for Engineers (Upper-Division B)  4

Concentration or General Curriculum in Electrical Engineering  3
(See list of Concentrations and General Curriculum in Electrical Engineering below)

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 (http://
catalog.calpoly.edu/collegesandprograms/collegeofengineering/
extelectricalengineering/bselectricalengineering/general-curriculum-in-
extelectrical-engineering/)
• Power (http://catalog.calpoly.edu/collegesandprograms/
collegeofengineering/electricalengineering/bselectricalengineering/power-concentration/)
• Radio Frequency - Microwaves - Photonics (http://
catalog.calpoly.edu/collegesandprograms/collegeofengineering/
extelectricalengineering/bselectricalengineering/radio-frequency-
microwaves-photonics-concentration/)
• Systems (http://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 (http://catalog.calpoly.edu/
generaletter/requirementsbachelorsdegree/#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).