BS COMPUTER ENGINEERING

Program Learning Outcomes

In addition to the general abilities expected of College of Engineering graduates, computer 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.

In addition to the general abilities expected of College of Engineering graduates, computer engineering students are expected to graduate with:

- Knowledge of probability and statistics, including applications appropriate to CPE program objectives.
- Knowledge of mathematics through differential and integral calculus, basic sciences, and engineering sciences necessary to analyze and design complex electrical and electronic devices, software, and systems containing hardware and software components, as appropriate to CPE program objectives.
- Knowledge of advanced mathematics, typically including differential equations, linear algebra, complex variables, and discrete mathematics.

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/generalrequirements/bachelorsdegree/#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</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPE 100</td>
<td>Computer Engineering Orientation</td>
<td>1</td>
</tr>
<tr>
<td>CPE/CSC 101</td>
<td>Fundamentals of Computer Science</td>
<td>4</td>
</tr>
<tr>
<td>CPE/CSC 123</td>
<td>Introduction to Computing</td>
<td>4</td>
</tr>
</tbody>
</table>

Select from the following:  

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

SUPPORT COURSES

- CHEM 124 General Chemistry for Physical Science and Engineering I (B1 & B3)  

Select from the following: (C2)  

- PHIL 230 Philosophical Classics: Knowledge and Reality  
- PHIL 231 Philosophical Classics: Ethics and Political Philosophy  

Select from the following: (Upper-Division C)  

- PHIL 323 Ethics, Science and Technology  
- PHIL 327 Robot Ethics  

Technical Electives  

Select from the following:  

- CPE/CSC 202 Data Structures  
- CPE/CSC 203 Project-Based Object-Oriented Programming and Design  
- CPE/EE 233 Computer Design and Assembly Language Programming  
- CPE 315 Computer Architecture  
- CPE/EE 329 Microcontroller-Based Systems Design  
- CPE/CSC 357 Systems Programming  
- CPE 350 Capstone I  
- CPE 450 Capstone II  
- CPE/CSC 453 Introduction to Operating Systems  

Select from the following:  

- CPE 461 & CPE 462 Senior Project I and Senior Project II  
- CSC 497 & CSC 498 Research Senior Project I and Research Senior Project II  
- CPE 464 Introduction to Computer Networks  
- CSC 248 Discrete Structures  
- CPE 327 & CPE 367 Digital Signals and Systems Laboratory  
- EE 228 Continuous-Time Signals and Systems  
- CPE 321 Introduction to Computer Security  
- CPE 422 or CPE 426 Network Security or Introduction to Hardware Security  
- EE 115 & EE 145 Electrical and Electronic Circuits I Laboratory  
- EE 215 & EE 245 Electrical and Electronic Circuits II Laboratory  
- EE 315 Electrical and Electronic Circuits III  

Select from the following:  

- Any 300-500 level CPE Course (up to 4 units of CPE 400)  
- Any 300-500 level CSC or EE Course  

Up to 8 units of any 200-500 level course offered by the College of Engineering or College of Science and Mathematics
General Education (GE) Requirements

- 72 units required, 32 of which are specified in Major and/or Support.
- If any of the remaining 40 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**