

BS GENERAL ENGINEERING

Program Learning Outcomes

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

CE 204	Mechanics of Materials I	3
CSC/CPE 101	Fundamentals of Computer Science ¹	4
EE 201 & EE 251	Electric Circuit Theory and Electric Circuits Laboratory	4
ENGR 110	Introduction to Engineering	2
IME 144	Introduction to Design and Manufacturing	4
IME 314 or IME 315	Engineering Economics Financial Decision Making for Engineers	3
MATE 210 & MATE 215	Materials Engineering and Materials Laboratory I	4
ME 211	Engineering Statics	3
ME 212	Engineering Dynamics	3
ME 302	Thermodynamics I	3
ME 341	Fluid Mechanics I	3
ME 343	Heat Transfer	4
Select from the following:		6

ENGR 459 & ENGR 460 & ENGR 461	Interdisciplinary Senior Design Project I and Interdisciplinary Senior Design Project II and Interdisciplinary Senior Design Project III	
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or		
Senior Project in appropriate engineering discipline		
General Curriculum in General Engineering or Individualized Course of Study ²		40

SUPPORT COURSES		
Select from the following (B1 & B3): ³		8
CHEM 124 & CHEM 125	General Chemistry for Physical Science and Engineering I and General Chemistry for Physical Science and Engineering II	
CHEM 127 & CHEM 128	General Chemistry for Agriculture and Life Science I and General Chemistry for Agriculture and Life Science II	
ES 350 or ES 351	Gender, Race, Culture, Science & Technology ⁴ Gender, Race, Class, Nation in Global Engineering, Technology & International Development	4
MATH 141	Calculus I (B4) ³	4
MATH 142	Calculus II (B4) ³	4
MATH 143	Calculus III (Area B Electives) ³	4
MATH 241	Calculus IV	4
MATH 244	Linear Analysis I	4
Select from the following (Upper-Division B): ³		4
MATH 344	Linear Analysis II	
STAT 312	Statistical Methods for Engineers	
STAT 350	Probability and Random Processes for Engineers	
PHYS 141	General Physics I (Area B Electives) ³	4
PHYS 142	General Physics II	4
PHYS 143	General Physics III	4
Physical Science Electives		
Select from the following: ⁵		4
CHEM 126 or CHEM 129	General Chemistry for Physical Science and Engineering III General Chemistry for Agriculture and Life Science III	
GEOL 102	Introduction to Geology	
GEOL 201	Physical Geology	
GEOL 241	Physical Geology Laboratory	
GEOL 305	Seismology and Earth Structure	
PHYS 211	Modern Physics I	
PHYS 323	Optics	
GENERAL EDUCATION		
(See GE program requirements below.)		48
FREE ELECTIVES		
Free Electives ⁴		0
Total units		186

- ¹ Students with an approved Individualized Course of Study may substitute CSC 231 (2 units) plus an additional 2 units of other advisor approved coursework for CSC/CPE 101 (4 units).
- ² The Individualized Course of Study consists of 40 units of technical electives with a minimum of 29 units at the 300-400 level.
- ³ Required in Major or Support; also satisfies General Education (GE) requirement.
- ⁴ If a General Education (GE) course 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.
- ⁵ Students in the General Curriculum in General Engineering should choose a minimum of 3 units of 300-400 level Physical Science Electives in order to meet 60 units of upper-division required for the degree.

General Curriculum in BS General Engineering or Individualized Course of Study (Select one)

General Curriculum in General Engineering (<https://catalog.calpoly.edu/collegesandprograms/collegeofengineering/generalengineering/bsgeneralengineering/generalcurriculum/>)
Individualized Course of Study

This program is for self-directed, highly motivated students, allowing them to pursue a customized course of study that meets their individual needs and interests. The Individualized Course of Study consists of 40 units of technical electives with a minimum of 29 of these units at the 300-400 level. Courses are selected by the student with the advice and approval of the student's academic advisor.

General Education (GE) Requirements

- 72 units required, 24 of which are specified in Major and/or Support.
- If any of the remaining 48 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
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		48

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