

GENERAL ENGINEERING (BS)

Offered at: San Luis Obispo Campus

The General Engineering program provides students with the highest quality technical and professional engineering education, with a particular emphasis in new or evolving interdisciplinary areas while allowing students to participate in designing their own curricula. It is unique in that it is truly interdisciplinary where students take course from across the university while developing integration and problem solving skills. It also brings together mathematics, the fundamental sciences, engineering sciences, engineering design, and the liberal arts in a rich, flexible, student-driven academic environment that allows each student to develop core competencies and a unique, individualized area of expertise. All practitioners of engineering must have a solid understanding of the physical sciences and mathematics as well as a firm grasp of engineering sciences. The General Engineering curriculum provides the framework for this matrix of understanding, upon which the practitioner may begin to develop a unique area of expertise. The theoretically complete and laboratory-centered, practice-oriented, hands-on education that is the foundation of the General Engineering program allows graduates to immediately participate and to excel in professional environments. The BS degree in General Engineering is, therefore, a direct path to employment in a traditional engineering field or in an emerging technology area. It is also a natural step toward a professional or a graduate degree.

Each student will create an Individualized Course of Study to align with academic and career goals that may fall outside the typical engineering major. This allows students the latitude in course selection required to educate themselves either in the classical study of engineering or in an individual passion involving interdisciplinary technologies. A sound foundation in the fundamental principles of engineering and engineering systems is built during the early years of study, and students customize the later years of their study plan with the help of a faculty advisor, allowing students the opportunity to focus their education while still at the undergraduate level. This is accomplished primarily by selecting advanced technical elective courses that are consistent with the student's sharply defined career goal. Examples of study plans created in the past have emphasized audio engineering, sustainable energy, bioengineering, chemical engineering, humanitarian engineering, technology management, and engineering in unique environments.

General Engineering graduates are ready for immediate entry into the professional engineering field or entrance to graduate school. They possess a solid engineering foundation that underpins a successful career. They can become leaders, based on solid fundamental engineering knowledge, strong communication skills, a capacity to form teams and perform at a high level in teams, and an understanding of the economic and social impact of their decisions. General Engineering graduates have used this program as a foundation for advanced studies and careers in engineering, project management, technical sales, law, entrepreneurship, medicine, education, and many other paths defined by their keen intellects and adventuresome spirits.

Concentrations

Individualized Course of Study

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An Individualized Course of Study consists of 26 units of technical electives to be selected by the student in consultation with and approved by the student's faculty advisor. A minimum of 18 of the 26 units must be at the 3000-4000 (upper-division) level. The list of courses is a contract between the student and the Department.

Program Learning Objectives

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/academic-standards-policies/general-requirements-bachelors-degree/>) section of this catalog, including:

- 40 units of upper-division courses
- 2.0 GPA

- Graduation Writing Requirement (GWR)
- U.S. Cultural Pluralism (USCP)

Note: No Major or Support courses may be selected as credit/no credit. In addition, no more than 12 units of cooperative or internship courses can count towards your degree requirements.

Code	Title	Units
MAJOR COURSES		
CSC 1032	Programming for Scientists and Engineers	3
EE 2115 & 2115L	Circuits & Electronics for Non-Majors and Circuits & Electronics Laboratory for Non-Majors	4
ENGR 1110	Introduction to Engineering	1
ENGR 2211	Introduction to Mechanics	4
ENGR 2212	Introduction to Engineering Dynamics	2
ENGR 3310	Ethical Engineering for the Anthropocene	2
IME 1140 & IME 1143	Technical Graphics Communication for Design and Manufacturing and Introduction to Design and Manufacturing	3
IME 2315	Financial Decision Making for Engineers	2
MATE 1220 & MATE 1215	Principles of Materials Engineering for Non-Majors and Materials Laboratory I	3
ME 3302	Thermodynamics	3
Senior Project		
ENGR 4460	Interdisciplinary Senior Project I	2
ENGR 4461	Interdisciplinary Senior Project II	2
Approved Electives		
Individualized Course of Study ¹		26
SUPPORT COURSES		
CHEM 1120	Fundamentals of Chemical Structure and Properties (5A & 5C) ²	4
MATH 1261	Calculus I (2) ²	4
MATH 1262	Calculus II	4
MATH 2263	Calculus III	3
PHYS 1141	General Physics I	4
PHYS 1143	General Physics II	4
STAT 3210	Engineering Statistics (Upper-Division 2/5) ²	3
WGQS 3350 or WGQS 3351	Gender, Race, Culture, Science, and Technology Gender, Race, Class, Nation: Critical Computing and Engineering Studies	4
GENERAL EDUCATION (GE)		
(See GE program requirements below)		33
FREE ELECTIVES		
Free Electives		0
Total Units		120

¹ The Individualized Course of Study consists of 26 units of technical electives with a minimum of 18 units at the 3000-4000 level.

² Required in Major or Support; also satisfies General Education (GE) requirement.

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General Education (GE) Requirements

- 43 units required, 10 of which are specified in Major and/or Support.
- If any of the remaining 33 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/academic-standards-policies/general-requirements-bachelors-degree/#generaleducationtext>).
- A grade of C- or better is required in one course in each of the following GE Areas: 1A (English Composition), 1B (Critical Thinking), 1C (Oral Communication), and 2 (Mathematics and Quantitative Reasoning).

Lower-Division General Education

Area 1	English Communication and Critical Thinking	
1A	Written Communication	3
1B	Critical Thinking	3
1C	Oral Communication	3
Area 2	Mathematics and Quantitative Reasoning	
2	Mathematics and Quantitative Reasoning (3 units in Support) ¹	0
Area 3	Arts and Humanities	
3A	Arts	3
3B	Humanities: Literature, Philosophy, Languages other than English	3
Area 4	Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)	
4A	American Institutions (Title 5, Section 40404 Requirement)	3
4B	Social and Behavioral Sciences	3
Area 5	Physical and Life Sciences	
5A	Physical Sciences (3 units in Support) ¹	0
5B	Life Sciences	3
5C	Laboratory (may be embedded in a 5A or 5B course) (1 units in Support) ¹	0
Area 6	Ethnic Studies	
6	Ethnic Studies	3
Upper-Division General Education		
Upper-Division 2/5	Mathematics and Quantitative Reasoning or Physical and Life Sciences (3 units in Support) ¹	0
Upper-Division 3	Arts and Humanities	3
Upper-Division 4	Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)	3
Total Units		33

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

Coming soon