

ARCHITECTURAL ENGINEERING (BS)

Offered at: San Luis Obispo Campus

Cal Poly's Department of Architectural Engineering's (ARCE) curriculum focuses on the structural engineering of buildings. By focusing on building design students are able to take many more structural engineering courses than is possible in a traditional civil engineering program. Beyond structural engineering courses, students take several architecture and construction management courses and studios, giving them an appreciation for these disciplines.

Laptop Requirement - The department has a requirement that all students have a laptop computer. Computing is an integral component in today's engineering environment. Many Architectural Engineering classes emphasize cooperative projects / assignments, and a laptop computer provides the required mobility to facilitate collaboration. Financial aid may be available to help cover the cost of the computer laptop (see the Financial Aid (<http://financialaid.calpoly.edu>) website for more information). Refer to department website for additional information.

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		
ARCE 1110	Introduction to Architectural Engineering	2
ARCE 1121	Structural Principles I	3
ARCE 2211	Structural Principles II	3
ARCE 2212	Structural Principles II Laboratory	1
ARCE 2222	Structural Systems Laboratory	2
ARCE 2223	Structural Drawings	2
ARCE 3311	Structural Analysis	3
ARCE 3312	Structural Analysis Laboratory	1
ARCE 3331	Timber Design	2
ARCE 3332	Timber Design and Constructability Laboratory	2
ARCE 3341	Steel Design	2
ARCE 3353	Soil Mechanics and Foundation Design	4
ARCE 4411	Structural Dynamics	3
ARCE 4412	Structural Dynamics Computing Laboratory	1
ARCE 4413	Seismic Analysis and Design	3
ARCE 4421	Architectural Engineering Building Systems	2

ARCE 4442	Steel Structures Design Laboratory	2
ARCE 4461	Reinforced Concrete and Masonry Design	4
ARCE 4462	Senior Project - Reinforced Concrete and Masonry Laboratory	2
ARCE Electives		
Select any 3000-5000 level ARCE course		3
SUPPORT COURSES		
ARCH 1101 & ARCH 1131	Architectural Design I and Architectural Representation I	6
Select from the following: (3A) ¹		3
ARCH 2221	History of World Architecture I: Prehistory to 17th Century	
ARCH 2222	History of World Architecture II: 17th Century to the Present	
ARCE 2280	History of Structures	
CHEM 1120	Fundamentals of Chemical Structure and Properties (5A & 5C) ¹	4
CM 1115	Fundamentals of Construction Management	4
CSC 1031	Programming for Engineers	2
MATH 1261	Calculus I (2) ¹	4
MATH 1262	Calculus II	4
MATH 2341	Linear Analysis	4
PHYS 1141	General Physics I	4
PHYS 1143	General Physics II	4
STAT 3210	Engineering Statistics (Upper-Division 2/5) ¹	3
CAED Interdisciplinary Electives		
Select from the following:		2-3
ARCE 4484	Interdisciplinary Project	
ARCE 4486	Collaborative Design Laboratory	
Select any 3000-5000-level ARCH, CM, CRP, or LA course up to 3 units		
FE/PE Surveying Elective		
Select from the following:		2-3
BRAE 1239	Engineering Surveying	
BRAE 2237	Introduction to Engineering Surveying	
CM 2239	Construction Surveying	
FE Technical Electives		
Select from the following:		5-6
GEOL 2240	Physical Geology	
GEOL 3305	Seismology and Earth Structure	
IME 2315	Financial Decision Making for Engineers	
MATH 2263	Calculus III	
ME 2212	Engineering Dynamics	
GENERAL EDUCATION (GE)		
(See GE program requirements below)		30
FREE ELECTIVES		
Free Electives		0
Total Units		128-131

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

General Education (GE) Requirements

- 43 units required, 13 of which are specified in Major and/or Support.
- If any of the remaining 30 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 units in Support) ¹		0
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		30
--------------------	--	-----------

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

Coming soon