BS ARCHITECTURAL 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 (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.

All ARCE majors must obtain a grade of C- or better in ARCE courses that are prerequisites for other ARCE courses.

MAJOR COURSES
ARCE 106 Introduction to Building Systems 2
ARCE 211 Structures I 3
ARCE 212 Structures II 3
ARCE 223 Mechanics of Structural Members 3
ARCE 224 Mechanics of Structural Members Laboratory 1
ARCE 227 Structures III 2
ARCE 257 Structural CAD for Building Design 2
ARCE 302 Structural Analysis 3
ARCE 303 Steel Design I 3
ARCE 304 Timber Design 3
ARCE 305 Masonry Design 2
ARCE 306 Matrix Analysis of Structures 3

SUPPORT COURSES
ARCH 131 & ARCH 132 & ARCH 133 Design and Visual Communication 1.1 and Design and Visual Communication 1.2 and Design and Visual Communication 1.3
CM 115 Fundamentals of Construction Management 6
CM 232 Evaluation of Cost Alternatives 3
or IME 314 Engineering Economics
CSC 231 Programming for Engineering Students 2
EE 201 Electric Circuit Theory 3
GEOL 201 Physical Geology 3
MATH 141 Calculus I (B4) 1
MATH 142 Calculus II (B4) 1
MATH 143 Calculus III (Area B Electives) 1
MATH 241 Calculus IV 4
MATH 244 Linear Analysis I 4
ME 302 Thermodynamics I 3
ME 341 Fluid Mechanics I 3
PHYS 141 General Physics IA (Area B Electives) 1
PHYS 132 General Physics II 4

ARCE 352 Structural Computing Analysis 1
ARCE 353 Matrix Structural Computing Analysis 1
ARCE 354 Numerical Analysis Laboratory 1
ARCE 371 Structural Systems Laboratory 3
ARCE 372 Steel Structures Design Laboratory 3
ARCE 412 Dynamics of Framed Structures 3
ARCE 421 Soil Mechanics 3
ARCE 422 Foundation Design 3
ARCE 444 Reinforced Concrete Design 4
ARCE 451 Timber and Masonry Structures Design and Constructability Laboratory 3
ARCE 452 Concrete Structures Design and Constructability Laboratory 3
ARCE 476 Architectural Structures Design and Constructability Laboratory 3
ARCE 483 Seismic Analysis and Design 3
ME 212 Engineering Dynamics 3

Senior Project
ARCE 415 Interdisciplinary Capstone Project 4
<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 133</td>
<td>General Physics III</td>
<td>4</td>
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<tr>
<td>STAT 312</td>
<td>Statistical Methods for Engineers</td>
<td>4</td>
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<tr>
<td>or STAT 321</td>
<td>Probability and Statistics for Engineers and Scientists</td>
<td>4</td>
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**GENERAL EDUCATION (GE)**

(See GE program requirements below.) 44

**FREE ELECTIVES**

Free Electives 0

Total units 196

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

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### 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/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
- **B2** Life Science 4
- **B3** One lab taken with either a B1 or B2 course 4
- **B4** Mathematics/Quantitative Reasoning (8 units in Support) 1

Upper-Division B (4 units in Support) 1

Area B Electives (8 units in Support) 1

### 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 units in Support) 1
- **C2** Humanities: Literature, Philosophy, Languages other than English 4

Lower-Division C Elective - Select a course from either C1 or C2.

Upper-Division C 4

### Area D

**Social Sciences**

- **D1** American Institutions (Title 5, Section 40404 Requirement) 4
- **D2** Lower-Division D 4

Area D Elective - Select either a lower-division or upper-division course. 4

**Area E**

**Lifelong Learning and Self-Development**

Lower-Division E 4

Total units 44

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