BS ARCHITECTURAL ENGINEERING

Program Learning Outcomes
1. An ability to apply knowledge of mathematics, science and engineering to building structures.
2. An ability to design and conduct experiments, as well as to analyze and interpret data.
3. An ability to design a building system, component, or process to meet desired needs within realistic constraints such as regulatory, economic, environmental, social, political, ethical, health and safety, constructability, and sustainability.
4. An ability to function in interdisciplinary teams for the design and construction of buildings.
5. An ability to identify, formulate and solve structural engineering problems.
6. An understanding of professional and ethical responsibility.
7. An ability to communicate effectively.
8. The broad education necessary to understand the impact of engineering solutions in a global and societal context.
9. A recognition of the need for and an ability to engage in life-long learning.
10. A knowledge of how the built environment relates to contemporary issues.
11. An ability to use the techniques, skills and tools necessary for structural engineering practice.
12. A basic proficiency in construction and constructability issues in buildings.

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
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

SUPPORT COURSES
ARCH 131 and Design and Visual Communication 1.1
& ARCH 132 and Design and Visual Communication 1.2
& ARCH 133 and Design and Visual Communication 1.3

ARCH 217 History of World Architecture: Prehistory - Middle Ages (C3) 1
or ARCH 218 History of World Architecture: Middle Ages - 18th Century
or ARCH 219 History of World Architecture: 18th Century - Present
or ARCE 260 History of Structures
BRAE 237 Introduction to Engineering Surveying 2
CHEM 124 General Chemistry for Physical Science and Engineering I (B3/B4) 1
CM 115 Fundamentals of Construction Management 6
CM 232 Evaluation of Cost Alternatives 3
or IME 314 Engineering Economics 3
CSC 231 Programming for Engineering Students 2
EE 201 Electric Circuit Theory 3
GEOL 201 Physical Geology 3
MATH 141 Calculus I 8
& MATH 142 and Calculus II (B1) 1
MATH 143 Calculus III (Add'l Area B) 1
MATH 241 Calculus IV 4
MATH 244 Linear Analysis I 4
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>ME 302</td>
<td>Thermodynamics I</td>
<td>3</td>
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<tr>
<td>ME 341</td>
<td>Fluid Mechanics I</td>
<td>3</td>
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<td>PHYS 141</td>
<td>General Physics IA (Add'l Area B)</td>
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<tr>
<td>PHYS 132</td>
<td>General Physics II</td>
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<td>&amp; PHYS 133</td>
<td>and General Physics III</td>
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<tr>
<td>STAT 312</td>
<td>Statistical Methods for Engineers (B6)</td>
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<tr>
<td>or STAT 321</td>
<td>Probability and Statistics for Engineers and</td>
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<td>Scientists</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 Support; also satisfies GE.

### General Education (GE) Requirements

- 72 units required, 28 of which are specified in Major and/or Support.
- See the complete GE course listing [here](http://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext).
- Minimum of 8 units required at the 300 level.

#### Area A  Communication

| A1         | Expository Writing                              | 4     |
| A2         | Oral Communication                              | 4     |
| A3         | Reasoning, Argumentation and Writing            | 4     |

#### Area B  Science and Mathematics

| B1         | Mathematics/Statistics (8 units in Support)     | 0     |
| B2         | Life Science                                    | 4     |
| B3         | Physical Science (4 units in Support)           | 0     |
| B4         | One lab taken with either a B2 or B3 course     |       |
| B6         | Upper-division Area B (4 units in Support)      | 0     |
| Additional Area B units (8 units in Support) | 0     |

#### Area C  Arts and Humanities

| C1         | Literature                                      | 4     |
| C2         | Philosophy                                     | 4     |
| C3         | Fine/Performing Arts (4 units in Support)       | 0     |
| C4         | Upper-division elective                         | 4     |

#### Area D/E  Society and the Individual

| D1         | The American Experience (Title 5, Section 40404 requirement) | 4     |
| D2         | Political Economy                                 | 4     |
| D3         | Comparative Social Institutions                  | 4     |
| D4         | Self Development (CSU Area E)                    | 4     |

Total units 44

1 Required in Support; also satisfies GE.