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  2
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  Design and Visual Communication  12
& ARCH 132  and Design and Visual Communication 1.1
& ARCH 133  and Design and Visual Communication 1.2
ARCH 217  History of World Architecture: Prehistory - Middle Ages (C3)  4
or ARCH 218  History of World Architecture: Middle Ages - 18th Century  4
or ARCH 219  History of World Architecture: 18th Century - Present  4
or ARCE 260  History of Structures  4
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</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ME 302</td>
<td>Thermodynamics I</td>
<td>3</td>
</tr>
<tr>
<td>ME 341</td>
<td>Fluid Mechanics I</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 141</td>
<td>General Physics IA (Add'l Area B)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 132</td>
<td>General Physics II</td>
<td>8</td>
</tr>
<tr>
<td>&amp; PHYS 133</td>
<td>General Physics III</td>
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<tr>
<td>STAT 312</td>
<td>Statistical Methods for Engineers (B6)</td>
<td>4</td>
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<tr>
<td>or STAT 321</td>
<td>Probability and Statistics for Engineers and 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 (http://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext).
- Minimum of 8 units required at the 300 level.

#### Area A  Communication

<table>
<thead>
<tr>
<th>Area A</th>
<th>Communication</th>
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<tbody>
<tr>
<td>A1</td>
<td>Expository Writing</td>
</tr>
<tr>
<td>A2</td>
<td>Oral Communication</td>
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<tr>
<td>A3</td>
<td>Reasoning, Argumentation and Writing</td>
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</tbody>
</table>

#### Area B  Science and Mathematics

<table>
<thead>
<tr>
<th>Area B</th>
<th>Science and Mathematics</th>
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</thead>
<tbody>
<tr>
<td>B1</td>
<td>Mathematics/Statistics (8 units in Support) 1</td>
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<tr>
<td>B2</td>
<td>Life Science</td>
</tr>
<tr>
<td>B3</td>
<td>Physical Science (4 units in Support) 1</td>
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<tr>
<td>B4</td>
<td>One lab taken with either a B2 or B3 course</td>
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<tr>
<td>B6</td>
<td>Upper-division Area B (4 units in Support) 1</td>
</tr>
<tr>
<td>Additional Area B units (8 units in Support) 1</td>
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</tbody>
</table>

#### Area C  Arts and Humanities

<table>
<thead>
<tr>
<th>Area C</th>
<th>Arts and Humanities</th>
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</thead>
<tbody>
<tr>
<td>C1</td>
<td>Literature</td>
</tr>
<tr>
<td>C2</td>
<td>Philosophy</td>
</tr>
<tr>
<td>C3</td>
<td>Fine/Performing Arts (4 units in Support) 1</td>
</tr>
<tr>
<td>C4</td>
<td>Upper-division elective</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Area D/E</th>
<th>Society and the Individual</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>The American Experience (Title 5, Section 40404 requirement)</td>
</tr>
<tr>
<td>D2</td>
<td>Political Economy</td>
</tr>
<tr>
<td>D3</td>
<td>Comparative Social Institutions</td>
</tr>
<tr>
<td>D4</td>
<td>Self Development (CSU Area E)</td>
</tr>
</tbody>
</table>

Total units 44

1 Required in Support; also satisfies GE.