BS AEROSPACE ENGINEERING

Program Learning Outcomes

**ABET-Defined 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
- 2.0 GPA
- Graduation Writing Requirement (GWR)
- U.S. Cultural Pluralism (USCP)

Note: No major, support or concentration courses may be selected as credit/no credit.

**MAJOR COURSES**

- **AERO 121** Aerospace Fundamentals 2
- **AERO 215** Introduction to Aerospace Design 2
- **AERO 220** Aerospace Systems Engineering and Integration 1
- **AERO 299** Aerospace Thermodynamics 4
- **AERO 300** Aerospace Engineering Analysis 5
- **AERO 302** Aerospace Fluid Mechanics 4
- **AERO 303** Aerospace Gas Dynamics and Heat Transfer 4
- **AERO 320** Fundamentals of Dynamics and Control 4
- **AERO 321** Experimental Sensors, Actuators and Control 1
- **AERO 331** Aerospace Structural Analysis I 4
- **AERO 350** Fundamentals of Systems Engineering 2
- **AERO 431** Aerospace Structural Analysis II 4
- **AERO 433** Experimental Stress Analysis 1
- **AERO 460** Aerospace Engineering Professional Preparation
- **AERO 465** Aerospace Systems Senior Laboratory 1
- **CE 204** Mechanics of Materials I 5
- **& CE 207** Mechanics of Materials II or **CE 208** Mechanics of Materials
- **EE 201** Electric Circuit Theory 4
- **& EE 251** Electric Circuits Laboratory 1

**Concentration Courses**

1. See Concentrations below

**SUPPORT COURSES**

- **BIO 213** Life Science for Engineers (B2) 2
- **BMED/BRAE 213** Bioengineering Fundamentals 2
- **CHEM 124** General Chemistry for Physical Science and Engineering I (B3/B4) 4
- **ENGL 149** Technical Writing for Engineers (A3) 2
- **IME 144** Introduction to Design and Manufacturing
- **MATE 210** Materials Engineering 3
- **MATH 141** Calculus I (B1) 4
- **MATH 142** Calculus II (B1) 4
- **MATH 143** Calculus III (Add'l Area B) 4
- **MATH 241** Calculus IV 4
- **MATH 244** Linear Analysis I 4
- **ME 211** Engineering Statics 3
- **ME 212** Engineering Dynamics 3
- **PHYS 132** General Physics II 4
- **PHYS 133** General Physics III 4
- **PHYS 141** General Physics IA (Add'l Area B) 4
- **STAT 312** Statistical Methods for Engineers (B6) 4

**GENERAL EDUCATION (GE)**

(See GE program requirements below.) 40

**FREE ELECTIVES**

Free Electives 0

Total units 190

1. See Concentrations below
2. Required in Support; also satisfies GE

**Concentrations (select one)**

- Aeronautics (http://catalog.calpoly.edu/collegesandprograms/collegeofengineering/aerospaceengineering/bsaerospaceengineering/aeronauticsconcentration)
- Astronautics (http://catalog.calpoly.edu/collegesandprograms/collegeofengineering/aerospaceengineering/bsaerospaceengineering/astronauticsconcentration)
### General Education (GE) Requirements

- 72 units required, 32 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.

<table>
<thead>
<tr>
<th>Area</th>
<th>Course</th>
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<tbody>
<tr>
<td>A1</td>
<td>Expository Writing</td>
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<tr>
<td>A2</td>
<td>Oral Communication</td>
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<tr>
<td>A3</td>
<td>Reasoning, Argumentation and Writing (4 units in Support)</td>
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<tr>
<td>B1</td>
<td>Mathematics/Statistics (8 units in Support) ¹</td>
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<tr>
<td>B2</td>
<td>Life Science (4 units in Support) ¹</td>
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<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>
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<td></td>
<td>Additional Area B units (8 units in Support) ¹</td>
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<tr>
<td>C1</td>
<td>Literature</td>
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<tr>
<td>C2</td>
<td>Philosophy</td>
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<td>C3</td>
<td>Fine/Performing Arts</td>
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<td>C4</td>
<td>Upper-division elective</td>
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<tr>
<td>D1</td>
<td>The American Experience (Title 5, Section 40404 requirement)</td>
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<tr>
<td>D2</td>
<td>Political Economy</td>
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<tr>
<td>D3</td>
<td>Comparative Social Institutions</td>
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<tr>
<td>E</td>
<td>Lower-division elective</td>
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Total units: 40

¹ Required in Support; also satisfies GE