BS ENVIRONMENTAL MANAGEMENT AND PROTECTION

Program Learning Objectives
1. Demonstrate critical-thinking problem-solving skills.
2. Effectively communicate scientific and technical knowledge in a professional manner.
3. Demonstrate competency in scientific and technical knowledge related to environmental management in the following key areas:
   a. Ecology and Biology – applied ecology to inform environmental impact analysis;
   b. Measurement – identification of key ecosystem elements, indicators and range of variability; land and water quality indicators;
   c. Management and Protection – developing alternatives and mitigation measures;
   d. Social, Economic, and Political – conflict management, CEQA (California Environmental Quality Act) and NEPA (National Environmental Policy Act) interpretation and analysis, i.e., environmental impact reports (EIR), environmental impact statements (EIS), and other environmental documents.
4. Demonstrate proficiency in quantitative skills and information management specific to their discipline areas.
5. Exhibit an understanding of their professional and ethical responsibilities as sustainability managers, environmental managers, natural resources managers, forest managers, including respect for diversity.
6. Promote life-long learning habits by exposing students to the discovery process of applied research and demonstration projects conducted by the faculty.

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/generalrequirementsbachelorsdegree/#generaleducationtext) section for this catalog, including:
- 60 units of upper-division courses
- Graduation Writing Requirement (GWR)
- 2.0 GPA
- U.S. Cultural Pluralism (USCP)

Note: No Major, Support or Concentration courses may be selected as credit/no credit.

MAJOR COURSES

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<td>NR 140</td>
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<td>Introduction to Organismal Form and Function</td>
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<td>Biodiversity of California</td>
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<td>Wildlife Conservation Biology</td>
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<td>Land and Resource Measurements</td>
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<td>NR/LA 218</td>
<td>Introduction to Geographic Information Systems (GIS)</td>
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<td>NR 306</td>
<td>Natural Resource Ecology and Habitat Management</td>
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<td>Environmental Life-Cycle Analysis</td>
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<td>or NR 402</td>
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<td>NR 323</td>
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<tr>
<td>or NR 324</td>
<td>Social Dimensions of Sustainable Food and Fiber Systems</td>
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<td>or NR 328</td>
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<td>NR 326</td>
<td>Natural Resources Economics and Valuation</td>
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<td>NR 335</td>
<td>Conflict Management in Natural Resources</td>
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<tr>
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<td>NR 416</td>
<td>Environmental Impact Analysis and Management</td>
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<tr>
<td>or BIO 161</td>
<td>Introduction to Cell and Molecular Biology</td>
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<tr>
<td>BIO 114</td>
<td>Plant Diversity and Ecology (B2 &amp; B3)</td>
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<td>Introduction to Engineering Surveying</td>
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<td>Introduction to Air Pollution</td>
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<td>or NR 310</td>
<td>Global Climate Change</td>
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<td>CHEM 127</td>
<td>General Chemistry for Agriculture and Life Science I (B1 &amp; B3)</td>
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MATH 161 Calculus for the Life Sciences I (B4) or MATH 221 Calculus for Business and Economics 4
PHYS 121 College Physics I 4
SS 120 Introductory Soil Science 4
STAT 217 Introduction to Statistical Concepts and Methods (GE Electives) 4
or STAT 218 Applied Statistics for the Life Sciences

Concentration (41 units) or Approved Electives (29 units) in combination with Free Electives 6,7,8

GENERAL EDUCATION (GE)
(See GE program requirements below.) 48

FREE ELECTIVES
Free Electives 0-12
Total units 180-182

1. Climate Change Science
2. Environmental Mitigation Strategies
3. Environmental Policy and Management
4. Environmental Soil Science
5. Forest and Environmental Practices
6. Geology
7. Geospatial Technology
8. Sustainable Agriculture
9. Urban Forestry

Additionally, a student may earn one or more of the following minors through the appropriate selection of Approved Electives in combination with Free Electives (refer to advising materials for the minor):

- Agribusiness
- Anthropology and Geography
- Biology
- City and Regional Planning
- Entrepreneurship
- Environmental Soil Science
- Geographic Information Systems for Agriculture
- Geology
- Indigenous Studies in Natural Resources and the Environment
- Land Rehabilitation and Restoration Ecology
- Law and Society
- Political Science
- Spanish
- Sustainable Agriculture
- Sustainable Environments
- Water Science

Approved Electives
Select from the following:

At least 6 units must be upper-division (300-400 level). Additional units of upper-division coursework may be needed, depending on coursework taken in Major or Support.

If a course is taken to meet a Major or Support requirement, it cannot be double-counted as an Approved Elective.

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<tr>
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<td>Principles of Organic Crop Production 8</td>
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<td>AG 339</td>
<td>Internship in Agriculture 8</td>
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<td>AG/EDES/ENGR/ISLA/SCM/UNIV 350</td>
<td>The Global Environment 8</td>
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<td>AG 360</td>
<td>Holistic Management 5, 8</td>
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<td>AGB 212</td>
<td>Agricultural Economics 8</td>
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<td>Agricultural Policy 8</td>
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<td>AGB 369</td>
<td>Agricultural Personnel Management 8</td>
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<td>AGC 205</td>
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<tr>
<td>ANT 201 or ANT 202</td>
<td>Cultural Anthropology 1 or World History Before Writing or GEOG 150 Human Geography</td>
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Concentrations
- Watershed Management and Hydrology (https://catalog.calpoly.edu/collegesandprograms/collegeoffaoarsefoodenvironmentsciences/naturalresourcesmanagementenvironmentalssciences/besenvironmentalmanagementandprotection/watershedmanagementandhydrologyconcentration/)
- Wildlife Biology (https://catalog.calpoly.edu/collegesandprograms/collegeoffaoarsefoodenvironmentsciences/naturalresourcesmanagementenvironmentalssciences/besenvironmentalmanagementandprotection/wildlifebiolgyconcentration/)

Approved Electives Guide
Approved Electives are courses that support the below career areas. Refer to number(s) next to each course to identify which courses align with each of the career areas. Consultation with an advisor is recommended prior to selecting Approved Electives; bear in mind your selections may impact pursuit of post-baccalaureate studies and/or goals.
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<td>ASCI 221</td>
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<td>ASCI 223</td>
<td>Systems of Small Ruminant Management</td>
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<td>ASCI 239</td>
<td>Principles of Rangeland Management</td>
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<td>ASCI 311</td>
<td>Advanced Beef Cattle System Management</td>
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<td>ASCI 370</td>
<td>Rangeland Improvements</td>
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<td>ASCI 465</td>
<td>Applied Practices for Monitoring California Rangelands</td>
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<td>BIO 263</td>
<td>Introductory Geology and Evolution</td>
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<td>Vertebrate Field Zoology</td>
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<td>Agricultural Power and Machinery Management</td>
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<td>BRAE 150</td>
<td>Design Graphics and CAD for Agricultural Engineering</td>
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<td>Organic Crop Production Systems</td>
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<td>PLSC 425</td>
<td>Arboriculture</td>
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<td>PLSC 431</td>
<td>Insect Pest Management</td>
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<td>PLSC 441</td>
<td>Biological Control for Pest Management</td>
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<td>PLSC 445</td>
<td>Cropping Systems</td>
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<td>PLSC 450</td>
<td>Current Issues in the Strawberry Industry</td>
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<tr>
<td>POLS 112</td>
<td>American and California Government</td>
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<td>POLS 245</td>
<td>Judicial Process</td>
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<td>POLS 332</td>
<td>World Food Systems</td>
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<td>POLS 341</td>
<td>American Constitutional Law</td>
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<td>POLS 343</td>
<td>Civil Rights in America</td>
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<td>POLS 344</td>
<td>Civil Liberties</td>
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<tr>
<td>PSC 201</td>
<td>Physical Oceanography</td>
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<td>RPTA 112</td>
<td>Introduction to Parks and Outdoor Recreation</td>
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<td>RPTA 210</td>
<td>Experience Design</td>
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<td>Leadership and Diverse Groups</td>
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<td>Environmental and Wilderness Education</td>
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<td>RPTA 313</td>
<td>Sustainability in the Experience Industry</td>
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<td>RPTA 314</td>
<td>Sustainable Travel and Tourism Planning</td>
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<td>Visitor Services in Experience Industry Management</td>
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<td>RPTA 325</td>
<td>Leadership in Outdoor Experiences</td>
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<td>RPTA 412</td>
<td>Advanced Experience Industry Management Applications</td>
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<td>RPTA 413</td>
<td>Tourism and Protected Area Management</td>
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<tr>
<td>SS 221</td>
<td>Soil Health and Plant Nutrition</td>
<td>4, 5, 8</td>
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<td>SS 321</td>
<td>Soil Morphology</td>
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<td>SS 322</td>
<td>Soil Plant Relationships</td>
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<td>SS 422</td>
<td>Soil Ecology</td>
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<td>SS 423</td>
<td>Environmental Soil and Water Chemistry</td>
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<td>SS 431</td>
<td>Digital Soil Mapping</td>
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<td>SS 440</td>
<td>Forest and Range Soils</td>
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<td>Soil Judging</td>
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<td>UNIV 391</td>
<td>Appropriate Technology for the World's People: Development</td>
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<tr>
<td>WVIT 233</td>
<td>Basic Viticulture</td>
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<tr>
<td>WVIT 331</td>
<td>Advanced Viticulture - Fall</td>
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<td>WVIT 332</td>
<td>Advanced Viticulture - Winter</td>
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<td>WVIT 333</td>
<td>Advanced Viticulture - Spring</td>
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<tr>
<td>WVIT 428</td>
<td>Wine grape Vineyard Management</td>
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</table>

**General Education (GE) Requirements**

- 72 units required, 24 of which are specified in Major and/or Support.
- If any of the remaining 48 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/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**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>A1</td>
<td>Oral Communication</td>
<td>4</td>
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<tr>
<td>A2</td>
<td>Written Communication</td>
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<tr>
<td>A3</td>
<td>Critical Thinking</td>
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**Area B**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>A1</td>
<td>Oral Communication</td>
<td>4</td>
</tr>
<tr>
<td>A2</td>
<td>Written Communication</td>
<td>4</td>
</tr>
<tr>
<td>A3</td>
<td>Critical Thinking</td>
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**Area B**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>A1</td>
<td>Oral Communication</td>
<td>4</td>
</tr>
<tr>
<td>A2</td>
<td>Written Communication</td>
<td>4</td>
</tr>
<tr>
<td>A3</td>
<td>Critical Thinking</td>
<td>4</td>
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</table>

**Area B**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>A1</td>
<td>Oral Communication</td>
<td>4</td>
</tr>
<tr>
<td>A2</td>
<td>Written Communication</td>
<td>4</td>
</tr>
<tr>
<td>A3</td>
<td>Critical Thinking</td>
<td>4</td>
</tr>
<tr>
<td>Area</td>
<td>Requirement</td>
<td>Units</td>
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<tr>
<td>-------</td>
<td>------------------------------------------------------------------------------</td>
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<tr>
<td>B1</td>
<td>Physical Science (4 units in Major)</td>
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<tr>
<td>B2</td>
<td>Life Science (4 units in Major)</td>
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<tr>
<td>B3</td>
<td>One lab taken with either a B1 or B2 course</td>
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<tr>
<td>B4</td>
<td>Mathematics/Quantitative Reasoning (4 units in Major)</td>
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<td></td>
<td><strong>Upper-Division B (4 units in Major)</strong></td>
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<tr>
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<td><strong>Area C</strong></td>
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</tr>
<tr>
<td></td>
<td>Arts and Humanities</td>
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<tr>
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<td>Lower-division courses in Area C must come from three different subject prefixes.</td>
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<tr>
<td>C1</td>
<td>Arts: Arts, Cinema, Dance, Music, Theater</td>
<td>4</td>
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<tr>
<td>C2</td>
<td>Humanities: Literature, Philosophy, Languages other than English</td>
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<td></td>
<td><strong>Lower-Division C Elective - Select a course from either C1 or C2</strong></td>
<td>4</td>
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<tr>
<td></td>
<td><strong>Upper-Division C</strong></td>
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<tr>
<td></td>
<td><strong>Area D</strong></td>
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<tr>
<td></td>
<td>Social Sciences - Select courses in Area D from at least two different prefixes</td>
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</tr>
<tr>
<td>D1</td>
<td>American Institutions (Title 5, Section 40404 Requirement)</td>
<td>4</td>
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<tr>
<td>D2</td>
<td>Lower-Division D</td>
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<tr>
<td></td>
<td><strong>Upper-Division D (4 units in Major)</strong></td>
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<tr>
<td></td>
<td><strong>Area E</strong></td>
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<tr>
<td></td>
<td>Lifelong Learning and Self-Development</td>
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<td></td>
<td><strong>Area F</strong></td>
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</tr>
<tr>
<td></td>
<td>Ethnic Studies</td>
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</tr>
<tr>
<td>F</td>
<td>Ethnic Studies</td>
<td>4</td>
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<tr>
<td></td>
<td><strong>GE Electives in Areas B, C, and D</strong></td>
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<tr>
<td></td>
<td>Select courses from two different areas; may be lower-division or upper-division courses.</td>
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<tr>
<td></td>
<td><strong>GE Electives (4 units in Major plus 4 units in GE)</strong></td>
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<tr>
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<td><strong>Total units</strong></td>
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</table>

1. Recommended course to satisfy GE Area A3: ENGL 147.
2. Required in Major or Support; also satisfies General Education (GE) requirement.
3. Recommended courses to satisfy GE Area Upper-division C: NR 360 or ENGL 316.