BS Environmental Management and Protection

Program Learning Objectives
- Critical thinking/problem solving
- Communication, teamwork and leadership
- Technical knowledge
- Quantitative skills and information management
- Ethics and sustainability principles
- Engage in lifelong learning

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 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

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>NR/ERSC 140</td>
<td>Careers in Natural Resources Management and Environmental Sciences</td>
<td>1</td>
</tr>
<tr>
<td>NR 142</td>
<td>Environmental Management</td>
<td>3</td>
</tr>
<tr>
<td>NR 208</td>
<td>Dendrology</td>
<td>4</td>
</tr>
<tr>
<td>or BIO 162</td>
<td>Introduction to Organismal Form and Function</td>
<td>4</td>
</tr>
<tr>
<td>NR 215</td>
<td>Land and Resource Measurements</td>
<td>2</td>
</tr>
<tr>
<td>NR/LA 218</td>
<td>Applications in GIS</td>
<td>3</td>
</tr>
<tr>
<td>NR 306</td>
<td>Natural Resource Ecology and Habitat Management</td>
<td>4</td>
</tr>
<tr>
<td>NR 311</td>
<td>Environmental Measurements and Interpretation</td>
<td>4</td>
</tr>
<tr>
<td>NR 320</td>
<td>Watershed Management and Restoration</td>
<td>4</td>
</tr>
<tr>
<td>or NR 402</td>
<td>Forest Health</td>
<td>4</td>
</tr>
<tr>
<td>NR 326</td>
<td>Natural Resources Economics and Valuation</td>
<td>4</td>
</tr>
<tr>
<td>NR 335</td>
<td>Conflict Management in Natural Resources</td>
<td>4</td>
</tr>
<tr>
<td>NR/CRP 404</td>
<td>Environmental Law</td>
<td>3</td>
</tr>
<tr>
<td>or NR/CRP 408</td>
<td>Water Resource Law and Policy</td>
<td>4</td>
</tr>
<tr>
<td>NR 416</td>
<td>Environmental Impact Analysis and Management</td>
<td>4</td>
</tr>
<tr>
<td>NR 425</td>
<td>Applied Resource Analysis and Assessment</td>
<td>4</td>
</tr>
<tr>
<td>NR 465</td>
<td>Ecosystem Management</td>
<td>4</td>
</tr>
<tr>
<td>Select one of the following courses to fulfill the senior project requirement:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NR/ERSC 476</td>
<td>Senior Project - Advanced Internship Experience in Environmental Science/Management</td>
<td>3</td>
</tr>
<tr>
<td>NR/ERSC 477</td>
<td>Senior Project - Research Experience in Environmental Science</td>
<td>3</td>
</tr>
</tbody>
</table>

TOTAL UNITS: 180-183

1. Students in the Wildlife Biology concentration need to take BIO 161 and BIO 162 to meet prerequisites for courses in the concentration.
2. Students in the Watershed Management and Hydrology concentration need to take NR 320 to meet prerequisites for courses in the concentration.
3. Students in the Wildlife Biology concentration need to take ASCI 329 or BIO 263. BIO 427 is required in the Wildlife Biology concentration, and cannot double count for both major and concentration.
4. For students in the Watershed Management and Hydrology concentration, PHYS 122 is recommended.
5. Required in Major; also satisfies GE.
6. Students in the Watershed Management and Hydrology concentration need to take MATH 161 to meet prerequisites for courses in the concentration.

Concentrations

- Watershed Management and Hydrology (http://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/naturalresourcesmanagementenvironmentalsciences/)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCI 329</td>
<td>Principles of Range Management</td>
<td>4</td>
</tr>
<tr>
<td>or BIO 263</td>
<td>Introductory Ecology and Evolution</td>
<td>4</td>
</tr>
<tr>
<td>or BIO 427</td>
<td>Wildlife Management</td>
<td>4</td>
</tr>
<tr>
<td>or PHYS 122</td>
<td>College Physics II</td>
<td>4</td>
</tr>
<tr>
<td>BIO 161</td>
<td>Introduction to Cell and Molecular Biology (B2 &amp; B4)</td>
<td>4</td>
</tr>
<tr>
<td>or BOT 121</td>
<td>General Botany</td>
<td>2</td>
</tr>
<tr>
<td>BRAE 237</td>
<td>Introduction to Engineering Surveying</td>
<td>4</td>
</tr>
<tr>
<td>or BRAE 247</td>
<td>Forest Surveying</td>
<td>4</td>
</tr>
<tr>
<td>or BRAE 239</td>
<td>Engineering Surveying</td>
<td>4</td>
</tr>
<tr>
<td>BRAE 348</td>
<td>Energy for a Sustainable Society (Area F)</td>
<td>4</td>
</tr>
<tr>
<td>or ENVE 324</td>
<td>Introduction to Air Pollution</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 111</td>
<td>Survey of Chemistry (B3)</td>
<td>4</td>
</tr>
<tr>
<td>or CHEM 127</td>
<td>General Chemistry for Agriculture and Life Science I</td>
<td>4</td>
</tr>
<tr>
<td>CHEM 312</td>
<td>Survey of Organic Chemistry</td>
<td>5</td>
</tr>
<tr>
<td>GEOL 201</td>
<td>Physical Geology</td>
<td>3</td>
</tr>
<tr>
<td>MATH 161</td>
<td>Calculus for the Life Sciences I (B1)</td>
<td>4</td>
</tr>
<tr>
<td>or MATH 221</td>
<td>Calculus for Business and Economics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 121</td>
<td>College Physics I</td>
<td>4</td>
</tr>
<tr>
<td>SS 121</td>
<td>Introductory Soil Science</td>
<td>4</td>
</tr>
<tr>
<td>STAT 217</td>
<td>Introduction to Statistical Concepts and Methods (B1)</td>
<td>4</td>
</tr>
<tr>
<td>or STAT 218</td>
<td>Applied Statistics for the Life Sciences</td>
<td>4</td>
</tr>
</tbody>
</table>

Concentration, Minor, or Approved Electives (see below) 35

GENERAL EDUCATION (GE)
(See GE program requirements below.) 52

FREE ELECTIVES
Free Electives 0
• Wildlife Biology (http://catalog.calpoly.edu/collegesandprograms/collegeofagriculturefoodenvironmentalsciences/naturalresourcesmanagementenvironmentalsciences/bsenvironmentalmanagementandprotection/wildlifebiologyconcentration)

Minor

With signature of advisor, any course used in a declared academic minor, not used to meet major requirements in the BS Environmental Management and Protection program. Additional units of Approved Electives (see below) must also be taken to meet the requirement of 35 units in the major. Note if a course is taken to meet a requirement in the minor, the same course cannot be double-counted as an approved elective.

Approved Electives Guide

Approved electives have been categorized by career area to guide students in their selections. At least 9 units must be taken at the 300-400 level. Advisor approval of electives or any specific Career Elective Area (CEA) is not required, but consultation with an advisor is recommended because selection may impact pursuit of post-baccalaureate studies and/or goals.

Courses used to meet a degree requirement cannot double count as an elective.

Approved Career Elective Areas

Select Career Elective Area (CEA) of choice: 35

Climate Change Science

Courses in this CEA may count towards the Anthropology and Geography Minor. Refer to advising materials for the minor.

ANT 201 Cultural Anthropology
or ANT 202 World Prehistory
or GEOG 150 Introduction to Cultural Geography

ANT 250 Biological Anthropology

BRAE 348 Energy for a Sustainable Society

ERSC/GEOG 250 Physical Geography

ERSC/GEOG 325 Climate and Humanity

ERSC/GEOG 414 Global and Regional Climatology

ERSC/GEOG 415 Applied Meteorology and Climatology

GEOG 301 Geography of Resource Utilization

GEOG 308 Global Geography

GEOG 328 Applications in Remote Sensing

NR 339 Internship in Forest and Natural Resources
or ERSC 339 Internship in Environmental Earth and Soil Sciences

NR 418 Applied GIS

NR 435 Natural Resource Policy Analysis

NR 475 Sustainable Forest and Environmental Practices

PHYS 107 Introduction to Meteorology

Environmental Mitigation Strategies

Courses in this CEA may count towards the City and Regional Planning, Land Rehabilitation and Restoration Ecology, Environmental Studies, or Sustainable Environments minor. For further information, refer to advising materials for the minors.

BIO 427 Wildlife Management

ENVE 330 Environmental Quality Control

NR 339 Internship in Forest and Natural Resources
or ERSC 339 Internship in Environmental Earth and Soil Sciences

NR/CRP 404 Environmental Law

NR/CRP 408 Water Resource Law and Policy

NR/BIO/SS 421 Wetlands

NR 475 Sustainable Forest and Environmental Practices

ZOO 329 Vertebrate Field Zoology

Any upper division BIO, CRP, ERSC, LA, NR, SS, or ZOO course

Environmental Policy and Management

CRP 212 Introduction to Urban Planning

CRP 420 Land Use Law

ECON 221 Microeconomics

ECON 431 Environmental Economics

ENVE 330 Environmental Quality Control

ERSC 223 Rocks and Minerals

NR 339 Internship in Forest and Natural Resources
or ERSC 339 Internship in Environmental Earth and Soil Sciences

NR/CRP 404 Environmental Law

NR/CRP 408 Water Resource Law and Policy

NR 435 Natural Resource Policy Analysis

NR 475 Sustainable Forest and Environmental Practices

PHIL 340 Environmental Ethics

POLS 112 American and California Government

POLS 245 Judicial Process

POLS 341 American Constitutional Law

POLS 343 Civil Rights in America

POLS 344 Civil Liberties

SS 321 Soil Morphology

SS 431 Soil Resource Inventory

Environmental Soil Science

Courses in this CEA may count towards the Environmental Soil Science minor. For further information, refer to advising materials for the minor.

CHEM 128 General Chemistry for Agriculture and Life Science II

CHEM 129 General Chemistry for Agriculture and Life Science III

ERSC 202 Soil Erosion and Water Conservation

ERSC 223 Rocks and Minerals

ERSC 323 Geomorphology

NR 339 Internship in Forest and Natural Resources
or ERSC 339 Internship in Environmental Earth and Soil Sciences

NR 475 Sustainable Forest and Environmental Practices

SS 221 Fertilizers and Plant Nutrition

SS 321 Soil Morphology

SS 322 Soil Plant Relationships

Last updated: 01/29/16
SS 402  Soil, Compost, and Water Testing Enterprise
SS/NR/BIO 421  Wetlands
SS 422  Soil Ecology
SS 423  Environmental Soil and Water Chemistry
SS 431  Soil Resource Inventory
SS 432  Environmental Soil Physics
SS 440  Forest and Range Soils
SS 442  Soil Vadose Zone and Groundwater Processes
SS 444  Soil Judging
SS 453  Tropical Soils

Forest and Environmental Practices

AEPS 382  Restoration Horticulture
AEPS 321  Weed Biology and Management
AEPS 327  Vertebrate Pest Management
AEPS 425  Arboriculture
AG 360  Holistic Management
AGB 315  Land Economics
BIO 435  Plant Physiology
BRAE 133  Introduction to Engineering Design Graphics
BRAE 151  CAD for Agricultural Engineering
BRAE 340  Irrigation Water Management
CRP 212  Introduction to Urban Planning
CRP 336  Introduction to Environmental Planning
CRP 420  Land Use Law
ERSC 223  Rocks and Minerals
JOUR 203  News Reporting and Writing
JOUR 205  Agricultural Communications
MCRO 436  Environmental Microbiology
NR 204  Wildland Fire Control
NR/ES 308  Fire and Society
NR 312  Technology of Wildland Fire Management
NR 339  Internship in Forest and Natural Resources
or ERSC 339  Internship in Environmental Earth and Soil Sciences
NR 340  Wildland Fire Management
NR 350  Urban Forestry
NR/ES 360  Ethnicity and the Land
NR 400  Special Problems for Advanced Undergraduates
NR/CRP 404  Environmental Law
NR/CRP 408  Water Resource Law and Policy
NR 418  Applied GIS
NR 420  Advanced Watershed Hydrology
NR/SS/BIO 421  Wetlands
NR 434  Wood Properties, Products and Sustainable Uses
NR 450  Community Forestry
NR 455  Wildland-Urban Fire Protection
NR 475  Sustainable Forest and Environmental Practices
SS 221  Fertilizers and Plant Nutrition
SS 321  Soil Morphology
SS 433  Land Use Planning
SS 431  Soil Resource Inventory

SS 440  Forest and Range Soils
Any upper division BIO, BOT, CHEM, COMS, JOUR, MCRO, or ZOO course

Geology

Courses in this CEA may count towards the Geology minor. For further information, refer to advising materials for the minor.

ERSC 223  Rocks and Minerals
ERSC 323  Geomorphology
GEOL 206  Geologic Excursions
GEOL 241  Physical Geology Laboratory
GEOL 305  Fundamentals of Seismology
GEOL 310  Igneous and Metamorphic Petrology
GEOL 330  Principles of Stratigraphy
GEOL/ERSC 401  Field-Geology Methods
GEOL/ERSC 402  Geologic Mapping
GEOL 415  Structural Geology
GEOL 420  Applied Geophysics
MATH 142  Calculus II
or MATH 162  Calculus for the Life Sciences II
NR 339  Internship in Forest and Natural Resources
or ERSC 339  Internship in Environmental Earth and Soil Sciences
PHYS 122  College Physics II
or PHYS 132  General Physics II

Geospatial Technology

Courses in this CEA may count towards the Geographic Information Systems minor. For further information, refer to advising materials for the minor.

AEPS 244  Precision Farming
BRAE 133  Introduction to Engineering Design Graphics
BRAE 151  CAD for Agricultural Engineering
BRAE 239  Engineering Surveying
BRAE 345  Aerial Photogrammetry and Remote Sensing
BRAE 447  Advanced Surveying with GIS Applications
CE 112  Design Principles in Civil Engineering
CRP 336  Introduction to Environmental Planning
CSC/CPE 235  Fundamentals of Computer Science for Scientists and Engineers I
ERSC 223  Rocks and Minerals
GEOG/ERSC 250  Physical Geography
GEOG 328  Applications in Remote Sensing
NR 339  Internship in Forest and Natural Resources
or ERSC 339  Internship in Environmental Earth and Soil Sciences
NR 418  Applied GIS
NR 475  Sustainable Forest and Environmental Practices
SS 321  Soil Morphology
SS 431  Soil Resource Inventory

Sustainable Agriculture

Courses in this CEA may count towards the Sustainable Agriculture minor. For further information, refer to advising materials for the minor.
General Education (GE) Requirements

- 72 units required, 20 of which are specified in Major and/or Support.
- See the complete GE course listing (http://catalog.calpoly.edu/generalrequirementsbachelorsdegree/#generaleducationtext).
- Minimum of 12 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 Major) 0
- B2 Life Science (4 units in Major) 0
- B3 Physical Science (4 units in Major) 0
- B4 One lab taken with either a B2 or B3 course

### Area C Arts and Humanities
- C1 Literature 4
- C2 Philosophy 4
- C3 Fine/Performing Arts 4
- C4 Upper-division elective 4
- Area C elective (Choose one course from C1-C5) 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
- D5 Upper-division elective 4

### Area F Technology
- F Upper-division elective (4 units in Major) 0

Total units: 52

1 Required in Major; also satisfies GE.