ENVIRONMENTAL MANAGEMENT AND PROTECTION (BS)

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/academic-standards-policies/general-requirements-bachelors-degree/) section for this catalog, including:

- 40 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. In addition, no more than 12 units of cooperative or internship courses can count towards your degree requirements.

Code	Title	Units
MAJOR COURSES		
NR 1142	Environmental Management	4
NR/LA 2218	Introduction to Geographic Information Systems (GIS)	3
NR 3363	Career Preparation and Practices in Natural Resources Fields	2
Select from the following:		3
NR 2208	Dendrology	
BIO 2215	Biodiversity of California	
BIO 2217	Wildlife Conservation Biology	
Select from the following:		4
NR 3304	Agroecology	
NR 3305	Forest and Fire Ecology	
NR 3306	Natural Resource Ecology and Habitat Management	
Select from the following: (Upper-Division 4) [1]		3-4
NR 3308	Fire and Society	
NR 3323	Human Dimensions in Natural Resources Management	
NR 3324	Social Dimensions of Sustainable Food Systems	
NR 3328	Environmental Leadership and Community Engagement	
NR 3335	Conflict Management in Natural Resources	
Select from the following: (Upper-Division 2/5) [1]		3-4
NR 3310	Global Climate Change	
BOT 3311	Plants, People and Civilization	
BRAE 3348	Energy for a Sustainable Society	
ENVE 3324	Introduction to Air Pollution	
Select from the following:		3-4
NR 3319 & NR 3320	Watershed Processes and Management and Watershed Processes and Management Laboratory	
NR 4402	Forest Health and Disturbance Ecology	
NR/SS 4421	Wetlands	
SS 3321	Soil Morphology	
ERSC 3303	Soil Erosion and Water Conservation	
Select from the following:		2-4
NR/AGB 3326	Natural Resources Economics and Valuation	
NR 4418	Applied Geographic Information System	
NR/SS 4431	Spatial Data Analysis and Environmental Mapping	
NR 4442	Environmental Life-Cycle Analysis	
NR 4445	Systems Thinking in Environmental Management	
Select from the following:		4
NR/CRP 4404	Environmental Law	

NR 4408/CRP 4404	Water Resource Law and Policy	
NR 4416	Environmental Impact Analysis and Management	
AG 4452	Leadership Seminar on Issues Affecting California Agriculture, Food Systems, and Natural Resources	
Select from the following:		3-4
NR 4460	Senior Project - Watershed Assessment and Protection	
NR 4462	Senior Project - Applied Resource Analysis and Assessment	
NR 4463	Senior Project - Ecological Restoration	
NR 4464	Senior Project - Environmental Policy Analysis	
NR 4465	Senior Project - Ecosystem Management	
Concentration		
(See list of Concentrations below) [2]		15-19
SUPPORT COURSES		
Select from the following: (5B & 5C) [1]		4
BIO 1111 & BIO 1112	General Biology and Biology Laboratory for Non-Majors	
BIO 1150	Life: History and Diversity	
BIO 1151	Life: Molecules and Cells	
BIO 1114	Plant Diversity and Ecology	4
or BOT 1121	General Botany	
Select from the following: (5A) [1]		4
CHEM 1120	Fundamentals of Chemical Structure and Properties	
CHEM 1122	Fundamentals of Chemical Reactivity	
Select from the following: (2) [1]		3-4
MATH 1264	Calculus for Data Science I	
MATH 1267	Business Calculus	
SS 1120	Introductory Soil Science	4
STAT 1110	Applied Statistical Concepts and Methods	3
GENERAL EDUCATION (GE)		
(See GE program requirements below)		27
FREE ELECTIVES		
Free Electives [3, 4]		11-22
Total Units		**120**

1 Required in Major or Support; also satisfies General Education (GE) requirement.

2 If a course is taken to meet a Major or Support requirement, it cannot be double-counted in a concentration.

3 If a General Education (GE) course 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.

4 Free Electives may need to be at the 3000-4000 level to ensure completion of the required minimum of 40 units of upper-division courses.

Concentrations

Conservation Science and Management

Code	Title	Units
REQUIRED COURSES		
Approved Electives		
Select from the following: [1, 2]		15
ASCI 2239	Principles of Rangeland Management	
ASCI 3370	Rangeland Improvements	
BIO 2253	Principles of Ecology and Evolution	
BIO 3312	Human Genetics	
BIO 3322	Ichthyology	
BIO 3324	Herpetology	

BIO 3325	General Entomology
BIO 3326	Invertebrate Zoology
BIO 3327	Wildlife Ecology
BIO 3343	Principles of Conservation Biology
BIO 3351	Principles of Genetics
BIO 4414	Evolution
BIO 4442	Behavioral Ecology
BIO 4444	Population and Community Ecology
BIO 4427	Wildlife Management
BOT 3313	Plant Taxonomy
BOT 3326	Plant Ecology
BOT 4433	Field Botany: California Plant Diversity
ERSC 3303	Soil Erosion and Water Conservation
NR 1141	Introduction to Forest Ecosystem Management
NR 3319 & NR 3320	Watershed Processes and Management and Watershed Processes and Management Laboratory
NR 4402	Forest Health and Disturbance Ecology
NR 4418	Applied Geographic Information System
NR/SS 4421	Wetlands
NR/SS 4431	Spatial Data Analysis and Environmental Mapping
PLSC 1120 & 1120L	Principles of Plant Sciences and Principles of Plant Sciences Lab
PLSC 1124	Plant Propagation
PLSC 1132	Introduction to Fruit Crop Production
PLSC 1150	California Row Crop Production
PLSC 2232	Basic Viticulture
SS 3321	Soil Morphology
SS 4440	Forest and Range Soils
Total Units	**15**

[1] Courses may need to be at the 3000-4000 level to ensure completion of the requirement minimum of 40 units of upper-division.

[2] If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.

Corporate Environmental Management

Code	Title	Units
REQUIRED COURSES		
Approved Electives		
Select from the following: [1, 2]		15
AG/ISLA/SCM/UNIV 3330	Cal Poly Land: Nature, Technology, and Society	
BUS 3310	Introduction to Entrepreneurship	
BUS 3382	Leadership and Organizations	
BUS/COMS 4458	Solving Big World Challenges	
ECON 2001	Survey of Economics	
ECON 2030	Microeconomics	
ECON 3050	The Economics of Equity and Social Welfare	
ENGL 3310	Corporate Communication	
ENVE 3323	Engineering for the Environment	
ITP 3330	Packaging Fundamentals	
ITP 3341	Packaging Polymers and Processing	
ITP 3371	Supply Chain Management in Manufacturing and Services	
ITP 4411	Packaging Sustainability	
ITP 4415	Supply Chain and Logistics	

MATE 1220	Principles of Materials Engineering for Non-Majors
MATE 3232	Materials Ethics, Diversity, and Society
NR/AGB 3326	Natural Resources Economics and Valuation
NR 4442	Environmental Life-Cycle Analysis
NR 4445	Systems Thinking in Environmental Management
PHIL 3323	Ethics, Science, and Technology
Total Units	**15**

1 Courses may need to be at the 3000-4000 level to ensure completion of the requirement minimum of 40 units of upper-division.

2 If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.

Environmental Data Science

Code	Title	Units
REQUIRED COURSES		
Approved Electives		
Select from the following: [1, 2]		15
BRAE 1239	Engineering Surveying	
BRAE 2237	Introduction to Engineering Surveying	
BRAE 3345	Photogrammetry and Remote Sensing with GIS Applications	
BRAE 4447	Advanced Surveying with GIS Applications	
GEOG 3328	Applications in Remote Sensing and GIS	
GEOG 4441	Advanced Applications in Geospatial Technologies	
NR 3335	Conflict Management in Natural Resources	
NR 4418	Applied Geographic Information System	
NR/SS 4431	Spatial Data Analysis and Environmental Mapping	
NR 4442	Environmental Life-Cycle Analysis	
NR 4445	Systems Thinking in Environmental Management	
STAT 1510	Statistics I	
STAT/DATA 1810	Introduction to Statistical Computing with R	
STAT 3430	Applied Regression Analysis	
STAT 3520	Statistics II	
STAT 3530	Applied Linear Models	
STAT 3540	Statistical Methods for Study Design and Analysis	
Total Units		**15**

1 Courses may need to be at the 3000-4000 level to ensure completion of the requirement minimum of 40 units of upper-division.

2 If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.

Environmental Law, Justice, and Policy

Code	Title	Units
REQUIRED COURSES		
Approved Electives		
Select from the following: [1, 2]		15
ERSC/GEOG 3325	Climate and Humanity	
GEOG 3308	Global Geography	
GEOG 4408	Geography of International Development	
NR/AGB 3326	Natural Resources Economics and Valuation	
NR 3335	Conflict Management in Natural Resources	
NR/CRP 4404	Environmental Law	
NR/CRP 4408	Water Resource Law and Policy	
NR 4416	Environmental Impact Analysis and Management	

PHIL 3340	Environmental Ethics
POLS 2225	Introduction to International Relations
POLS 2229	Introduction to Comparative Politics
POLS 3351	Public Policy and Administration
POLS 4419	Social Movements and Political Protest
POLS 4426	International Organizations and Law
Total Units	**15**

1 Courses may need to be at the 3000-4000 level to ensure completion of the requirement minimum of 40 units of upper-division.

2 If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.

Sustainable Agriculture

Code	Title	Units
REQUIRED COURSES		
Approved Electives		
Select from the following: [1, 2]		15
AG/GEOG/EDES/ENGR/ISLA/SCM/UNIV 3350	The Global Environment	
AG/ASCI 3360	Holistic Management	
AG 4452	Leadership Seminar on Issues Affecting California Agriculture, Food Systems, and Natural Resources	
BRAE 3340	Irrigation Water Management	
HNRS/PSC/UNIV 3391	Engaging in Sustainable Global Development	
HNRS/PSC/UNIV 3392	Collaboratively Developing Sustainable Technologies Globally	
NR 3304	Agroecology	
NR 3310	Global Climate Change	
NR 3324	Social Dimensions of Sustainable Food Systems	
NR 3360	Ethnicity, Culture, and the Environment in the United States	
PLSC 3315	Principles of Organic Crop Production	
PLSC 3444	Climate Smart Agriculture	
PLSC 4420	Organic Crop Production Systems	
POLS 3332	World Food Systems	
SS 2221	Soil Health and Plant Nutrition	
SS 3321	Soil Morphology	
SS 4440	Forest and Range Soils	
Total Units		**15**

1 Courses may need to be at the 3000-4000 level to ensure completion of the requirement minimum of 40 units of upper-division.

2 If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.

Sustainable Urban Development and Planning

Code	Title	Units
REQUIRED COURSES		
Approved Electives		
Select from the following: [1, 2]		15
BRAE 3348	Energy for a Sustainable Society	
CM 3317	Sustainability and the Built Environment	
CRP 1211	Urban Planning History	
CRP 1212	Introduction to City Planning	
CRP 1213	Methods of Population and Housing Analysis	
CRP 2214	Methods in Land Use and Transportation	
CRP 3334	Cities in a Global World	

CRP 3336	Introduction to Environmental Planning	
CRP 4435	Advancing the Transportation Revolution	
CRP 4445	Green Infrastructure	
EDES 4406	Sustainable Environments	
EDES 4408	Implementing Sustainability Principles	
NR/CRP 4404	Environmental Law	
NR/CRP 4408	Water Resource Law and Policy	
NR 4416	Environmental Impact Analysis and Management	
Total Units		**15**

1 Courses may need to be at the 3000-4000 level to ensure completion of the requirement minimum of 40 units of upper-division.

2 If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.

Water Science and Management

Code	Title	Units
REQUIRED COURSES		
Approved Electives		
Select from the following: [1, 2]		15
BRAE 3340	Irrigation Water Management	
BRAE/NR 3349	Water for a Sustainable Society	
ERSC 3303	Soil Erosion and Water Conservation	
ERSC 4442	Applied Groundwater Hydrology	
ERSC 4443	Applied Environmental Contaminant Transport	
ERSC 4450	Geomorphology	
GEOL 2240	Physical Geology	
NR 3319 & NR 3320	Watershed Processes and Management and Watershed Processes and Management Laboratory	
NR 3321	Water Resources Technology and Society	
NR/CRP 4408	Water Resource Law and Policy	
NR 4418	Applied Geographic Information System	
NR/SS 4421	Wetlands	
NR 4422	Stream Measurements and Water Quality Monitoring	
NR/SS 4431	Spatial Data Analysis and Environmental Mapping	
PHYS 1121	College Physics I	
SS 3321	Soil Morphology	4
SS 4440	Forest and Range Soils	
Total Units		**19**

1 Courses may need to be at the 3000-4000 level to ensure completion of the requirement minimum of 40 units of upper-division.

2 If a course is taken to meet a Major or Support requirement, it cannot be double-counted in the concentration.

General Education (GE) Requirements

General Education (GE) Requirements

- 43 units required, 16 of which are specified in Major and/or Support.
- If any of the remaining 27 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/academic-standards-policies/general-requirements-bachelors-degree/#generaleducationtext).
- A grade of C- or better is required in one course in each of the following GE Areas: 1A (English Composition), 1B (Critical Thinking), 1C (Oral Communication), and 2 (Mathematics and Quantitative Reasoning).

Lower-Division General Education		
Area 1	**English Communication and Critical Thinking**	
1A	Written Communication	3
1B	Critical Thinking	3
1C	Oral Communication	3
Area 2	**Mathematics and Quantitative Reasoning**	
2	Mathematics and Quantitative Reasoning (3 units in Support) [1]	0
Area 3	**Arts and Humanities**	
3A	Arts	3
3B	Humanities: Literature, Philosophy, Languages other than English	3
Area 4	**Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.)**	
4A	American Institutions (Title 5, Section 40404 Requirement)	3
4B	Social and Behavioral Sciences	3
Area 5	**Physical and Life Sciences**	
5A	Physical Sciences (3 units in Support) [1]	0
5B	Life Sciences (3 units in Support) [1]	0
5C	Laboratory (may be embedded in a 5A or 5B course) (1 units in Support) [1]	0
Area 6	**Ethnic Studies**	
6	Ethnic Studies	3
Upper-Division General Education		
Upper-Division 2/5	Mathematics and Quantitative Reasoning or Physical and Life Sciences (3 units in Major) [1]	0
Upper-Division 3	Arts and Humanities	3
Upper-Division 4	Social and Behavioral Sciences (Area 4 courses must come from at least two different course prefixes.) (3 units in Major) [1]	0
Total Units		**27**

[1] Required in Major or Support; also satisfies General Education (GE) requirement.