

# Environmental Science Curriculum Guide

*Please consult with your academic advisor before registering for classes*

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COLLEGE OF AGRICULTURE & LIFE SCIENCES

**Environmental Science**

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<b>General Education</b>	<b>Course</b>	<b>Units 32-40</b>
Introduction to General Education	UNIV 101	1
Foundation Mathematics: Moderate Strand	MATH 112 (Consult with advisor)	3
First Year Composition 1	ENGL 101	3
First Year Composition 2	ENGL 102, OR 109H	3
Foundation Second Language	Various (2 <sup>nd</sup> semester proficiency)	0-8
General Education, Exploring Perspectives	Artist	3
General Education, Exploring Perspectives	Humanist	3
General Education, Exploring Perspectives	Natural Scientist	3
General Education, Exploring Perspectives	Social Scientist	3
General Education, Building Connections	Building Connections	3
General Education, Building Connections	Building Connections	3
General Education, Building Connections	Building Connections	3
General Education Capstone Course	UNIV 301	1



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<b>Supporting Coursework</b>	<b>Course</b>	<b>Units (21)</b>
General Chemistry I (Quantitative) OR Chemical Thinking I OR Honors Chemical Thinking I	CHEM 141* & 145* OR 151 OR 161 & 163	4
General Chemistry II (Quantitative) OR Chemical Thinking II OR Honors Chemical Thinking II	CHEM 142* & 146* OR 152 OR 162 & 164	4
Introductory Biology I (Lecture)	MCB 181R	3
Biology of Environmental Systems OR Introductory Microbiology (Lecture)	ENVS 225 OR MIC 205A	3
Introductory Biology II (Lecture)	ECOL 182R	3
Introductory Physics I OR Introductory Mechanics	PHYS 102/181 OR 141	4



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<b>Environmental Science Core</b>	<b>Course</b>	<b>Units (32)</b>
Introduction to Soil Science & Soils Laboratory	ENVS 200 & 201	4
Environmental Essentials: A Global Approach to Saving Planet Earth	ENVS 210	3
Critical Zone Science	ENVS 270	3
Data Analysis in the Life and Environmental Sciences	ENVS 275	3
Pollution Science	ENVS 305	3
Environmental Chemistry (Choose one)	ENVS 340	
Environmental Chemistry	OR ENVS 462	3
OR Environmental Soil & Water Chemistry	OR ENVS 464	
OR Environmental Organic Chemistry		
Environmental Physics	ENVS 420	3
Environmental Ecology (Choose one)	ENVS 425	
Environmental Microbiology	OR 442	
OR Limnology	OR 474	3-4
OR Aquatic Plants & the Environment	OR 475	
OR Freshwater & Marine Algae	OR 477	
OR Principles of Ecotoxicology		
Environmental Assessment for Contaminated Sites	ENVS 480	3



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<b>Career Preparation</b>	<b>Course</b>	<b>Units</b>
Careers in Environmental Science	ENVS 195A	1
Science Communications (Choose one)		
Scientific Writing	ENVS 408	3
OR Translating Environmental Science	OR 415	
Capstone (Choose one)		
Environmental Monitoring & Remediation	ENVS 430 R/L	4
OR Senior Capstone: Intro to Research I & II	OR 498A* & 498B*	
Individual Student Presentation		0
Individual Studies: Directed Research, Internship, Teaching Workshop, Independent study, Practicum, OR Thesis	ENVS 392, 393, 397A, 399, 399H, 492, 493, 499, OR 499H	1-3



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*Environmental Science Subplans:*

<b>The Biosphere</b>		
<b>Required Courses</b>	<b>Course</b>	<b>Units (10)</b>
Calculus (Choose one)		
Elements of Calculus	MATH 113	
OR Mathematics of Biological Systems	OR 119A	3
OR First Semester Calculus	OR 122B	
OR Calculus I	OR 125	
Organic Chemistry I (Choose one)		
Organic Chemistry Lecture & Lab	CHEM 241A & 243	4
OR Organic Chemistry Lecture & Lab for chemistry majors	OR 246A & 247A	
Ecology (Choose one)		
Ecology	ECOL 302	3-4
OR Natural Resources Ecology	OR RNR 316	

<b>Biosphere emphasis Core</b>	<b>Course</b>	
Environmental Microbiology	ENVS 425	3
Environmental Microbiology Lab	ENVS 426	2
Aquatic Plants & The Environment	ENVS 474	4
Microbial Biogeochemistry & Global Change	ENVS 410	3
Environmental Drivers of Plant Adaptations	ENVS 435	3
Green Infrastructure	ENVS 450	3
Freshwater & Marine Algae	ENVS 475	4
Principles of Ecotoxicology	ENVS 477	3
Principles of Ecotoxicology Lab	ENVS 477L	1
Biochemistry	BIOC 462A	4-5
Metabolic Biochemistry	BIOC 385	3
Foundations in Biochemistry	BIOC 384	3
Lectures in Organic Chemistry (for chemistry majors)	CHEM 246B	3
Organic Chemistry Lab	CHEM 247B	1
Organic Chemistry II	CHEM 241B	3
Organic Chemistry Lab II	CHEM 243B	
Ecology	ECOL 302	4
Genetics	ECOL 320	4
Evolutionary Biology	ECOL 335	4

<b>Biosphere emphasis electives – complete 6 units</b>	<b>Course</b>	<b>Units</b>
Soil Fertility & Plant Nutrition	ENVS 316	3
Collaborative Environmental Problem Solving	ENVS 350	3
Microbial Biogeochemistry & Global Change	ENVS 410	3
Sustainable Management of Arid Lands and Salt-Affected Soils	ENVS 401	3
Soil Genesis & Classification	ENVS 431	3
Limnology	ENVS 442	3
Ecotoxicology	ENVS 477	3
Ecotoxicology Lab	ENVS 477L	1
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Living in Symbiosis	ECOL 310	3



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Conservation Biology in the Field	ECOL 406L	1
Conservation Biology	ECOL 406R	3
Physical Geology	GEOS 251	4
Ocean Sciences	GEOS 412A	4
Global Change	GEOS 478	3
Hydrology (Choose one)		
Watershed Hydrology	WSM 460A	3-4
OR Principles of Hydrology	OR HWRS 349A/B or 350	
Molecular Biology	MCB 411	3-4
Recombinant DNA Methods & Applications	MCB 473	4
Microbial Physiology	MIC 328R	3
Microbial Techniques	MIC 421B	3
Natural Resources Ecology	RNR 316	3
Natural Resource Management Practices	RNR 384	3
Applications of Geographic Information Systems	RNR 403	3
Climate Change and Dryland Ecosystem Ecology	RNR 452	3
Conservation Biology (Choose one)		
Conservation Biology: Field Studies in Developing Countries (Namibia)	RNR 495F	3-6
OR Amazon Rainforest: Conservation Biology in Ecuador	OR RNR 495G	



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Leadership, Sustainability and Communication		
Required Courses	Course	Units (9 Units)
Environmental Health (Choose two)		
Ecosystem Health and Justice	ENVS 310	
OR Toxic! The Anthropology of Exposure	ANTH 373	3
OR Reclamation and Redevelopment of Impacted Lands	ENVS 482	
OR Environment, Health, and Society	SOC/CHS 350	
Communications (Choose one)		
Translating Environmental Science	ENVS 415	
OR Scientific Writing for Environmental, Agricultural & Life Sciences	OR ENVS 408	
OR Communicating Knowledge in Agriculture and the Life Sciences	OR ALC 422	
OR Applied Organization Communication	OR COMM 312	3
OR Environmental Journalism	OR JOUR 455	
OR Issues in Covering Science and the Environment	OR JOUR 465	
OR Science Journalism	OR JOUR 472	
OR Science Communication	OR SCI 401	
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Leadership, Sustainability and Communication emphasis core	Courses	Units (11 units)
Environmental Anthropology (Choose one)		
Globalization, the Environment, and Indigenous Religions	RELI/ANTH/HUMS 428A	
OR Ecological Anthropology	OR ANTH 307	3
OR Environmental Archaeology	OR ANTH 332	
Teaching (Choose only one)		
Teaching Workshop	ENVS/BE 397A	
OR Teaching Geosciences	OR GEOS 397A	1-5
OR Undergrad Teaching Training in Ecology and Evolutionary Biology	OR ECOL 497A	
OR Environmental Learning	OR TLS 431	
Teaching & Technology (Choose only one)		
Teaching with New Technologies	ETCV 310	3
OR Integrating Technology into the Curriculum	OR TLS 318	
<i>Additional Selectives to choose from</i>		
Collaborative Environmental Problem Solving	ENVS 350	3
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Southwest Land & Society	ANTH/AIS/LAS 418	3
Toxic! The Anthropology of Exposure	ANTH 373	3
Introduction to Human Health Risk Assessment	EHS/ENVS 418	3
U.S. Environmental History	HIST 355	3
Global Environmental History	HIST 356	3
Natural History of Disasters	HIST 358	3
Environmental Ethics	PHIL/PA/PPEL 323	3
Environmental Psychology	PSY 374	3
Environmental Sociology	SOC 307	3
Social Movements & Activism	SOC 313	3
Environment, Health, and Society	SOC/CHS 350	3





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<b>Leadership, Sustainability and Communication Emphasis Elective Courses</b>	<b>Course</b>	<b>Units (9 units)</b>
Conservation Biology: Field Studies in Developing Countries	ENVS 495F	3
Math (Choose only one)		
Mathematics of Biological Systems	MATH 119A	
OR Elements of Calculus	OR MATH 113	3
OR First Semester Calculus	OR MATH 122B	
OR Calculus I	OR MATH 125	
Political Ecology	ANTH 424A	3
Environmental Economics	ECON/AREC 373	3
Economics of Policy Analysis	AREC 464	3
Environmental Law & Economics	AREC 476	3
Economic Analysis of Water, Food and Environmental Policies	AREC/ENVS 479	3
Weather, Climate, & Society	ATMO 336	3
Conservation Biology	ECOL 406R	3
Environmental Studies: Ideas/Institutions	EVS 260	3
Environment and Development	GEOG/EVS 362	3
Environmental & Resource Geography	GEOG/EVS 461	3
Introduction to Dendrochronology	GEOS/ANTH 439A	3
Global Change	GEOS 478	3
Natural History of Disaster	HIST 358	3
Environmental Law and Policy	LAW 454	3
Public International Environmental Law	LAW 459	3
Global Climate Change: Integrating Science, Policy, & Decision Making	PA 461	3
Formation of Public Policy	PA 480	3
Environmental Policy	PA 481	3
Environmental Land Use Planning	PLG 472	3
Psychology of Leadership	PSYV 471	3
Adaptation to Climate Change	RNR 440	3
Natural Resources Policy & Law	RNR 480	3
The Economics and Social Connections to Natural Resources	RNR/PA 485	3



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Physical and Chemical Dynamics		
Required Courses	Course	Units (7 units)
<i>Math (Choose only one)</i>		
<i>Mathematics of Biological Systems</i>	MATH 119A	3-4
<i>First Semester Calculus</i>	MATH 122B	
<i>Calculus I</i>	MATH 125	
Organic Chemistry I	CHEM 241A & 243A	4
Physical and Chemical Dynamics emphasis core		
Course	Course	Units (13 units)
Environmental Chemistry	ENVS/GEOS 340	3
Microbial Biogeochemistry and Global Change	ENVS/ECOL/PLS 410	3
Limnology	ENVS 442	3
Environmental Soil & Water Chemistry	ENVS 462	3
Environmental Organic Chemistry	ENVS 464	3
Soil Physics	ENVS 470	3
Principles of Ecotoxicology	ENVS 477	3
Principles of Ecotoxicology Laboratory	ENVS 477L	1
Foundations in Biochemistry	BIOC 384	3
Metabolic Biochemistry	BIOC 385	3
Biochemistry	BIOC 462A	3-5
Organic Chemistry II	CHEM 241B	3
Physical Chemistry	CHEM 480A	3
Physical Geology	GEOS 251	4
Hydrology (Choose only one)	HWRS/WSM 460A	3-4
Watershed Hydrology	OR HWRS 349A/B or	
OR Principles of Hydrology	350	
Hydrogeology	HWRS 431	4
Hydrology	HWRS/ATMO/CE 423	3
Calculus II	MATH 129	3
Physics (Choose only one)		3-4
Introductory Physics II	PHYS 103	
OR Introductory Mechanic	PHYS 141	
OR Introductory Optics and Thermodynamics	PHYS 142	
Physical and Chemical Dynamics emphasis elective courses		
Course	Course	Units (6 units)
Environmental Chemistry	ENVS/GEOS 340	3
Collaborative Environmental Problem Solving	ENVS 350	3
Sustainable Management of Arid Lands & Salt-Affected Soils	ENVS 401	3
Microbial Biogeochemistry & Global Change	ENVS/ECOL/GEOS/PLS 410	3
Environmental Microbiology	ENVS/MIC 425	3
Soil Genesis, Morphology & Classification	ENVS 431	3
Biodegradation of Pollutants	ENVS/MIC 440	3
Green Infrastructure	ENVS/LAR/PLG/SBE 450	3
Environmental Soil and Water Chemistry	ENVS 462	3
Environmental Organic Chemistry	ENVS 464	3
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Air Pollution I: Gases	ATMO 469A	3
Air Pollution II: Aerosols	ATMO 469B	3



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Environmental & Water Engineers	CHEE/CE 370R	3
Environmental & Water Engineers Lab	CHEE/CE 370L	1
Water Chemistry for Engineers	CHEE 400R	3
Water Chemistry for Engineers Lab	CHEE 400L	1
Introduction to Hazardous Waste Management	CHEE/CE 478	3
Inorganic Chemistry	CHEM 404A	3
Basic Laboratory Safety	CHEM 405A	1
Introduction to Geochemistry	GEOS 400	3
Chemistry of the Solar System	PTYS 407	3



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Soil, Air, and Water		
Required Courses	Course	Units (6 units)
Math (Choose only one)		
Elements of Calculus	MATH 113	3-4
OR Mathematics of Biological Systems	OR MATH 119A	
OR First Semester Calculus	OR MATH 122B	
OR Calculus I	OR MATH 125	
Soils (Choose one)		
Soil Ecology	ENVS 300	3
OR Soil Fertility & Plant Nutrition	OR ENVS 316	
OR Sustainable Management of Arid Lands & Salt-Affected	OR ENVS 401	
Soils		
OR Soil Genesis and Classification	OR ENVS 431	3
OR Soil Physics	OR ENVS 470	
OR Reclamation and Redevelopment of Impacted Lands	OR ENVS 482	
Soil, Air, and Water emphasis core	Course	Units (12 units)
Soil Ecology	ENVS 300	3
Soil Fertility & Plant Nutrition	ENVS 316	3
Collaborative Environmental Problem Solving	ENVS 350	3
Sustainable Management of Arid Lands & Salt-Affected Soils	ENVS 401	3
Microbial Biogeochemistry and Global Change	ENVS/ECOL/GEOS/PLS 410	3
Soil Genesis, Morphology & Classification	ENVS 431	3
Limnology	ENVS 442	3
Green Infrastructure	ENVS/LAR/SBE 450	3
Water Harvesting	ENVS 454	3
Environmental Soil and Water Chemistry	ENVS 462	3
Soil Physics	ENVS 470	3
Principles of Ecotoxicology	ENVS 477	3
Principles of Ecotoxicology Lab	ENVS 477L	1
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Fundamentals of Atmospheric Sciences	ATMO 436A	3
Organic Chemistry I	CHEM 241A	3
Organic Chemistry Lab I	CHEM 243A	1
Ocean Sciences	GEOS/ATMO/ENVS/ECOL 412A	4
<i>Hydrology (Choose only one)</i>		
<i>Watershed Hydrology</i>	WSM/HWRS 460A	3-4
<i>OR Principles of Hydrology</i>	OR HWRS 350	
<i>OR Principles of Hydrology (online)</i>	OR HWRS 349A & 349B*	
Physics (choose only one)		
Introductory Physics II	PHYS 103	3-4
OR Introductory Mechanic	PHYS 141	
OR Introductory Optics and Thermodynamics	PHYS 142	
GIS (Choose only one)		
Applications of Geographic Information Systems	GEOG/RNR 403	3
OR Geographic Information Systems for Natural & Social Science	OR RNR/GEOG 417	



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Dryland Ecohydrology and Vegetation Dynamics	RNR/ECOL/WSM 452	4
Principals of Stratigraphy & Sedimentation	GEOS 302	4
Geomorphology and Landscape Evolution	GEOS 450	4
Global Change	GEOS 478	3
Environmentally Acquired Illnesses	EHS 420	3

<b>Soil, Air, and Water emphasis elective courses</b>	<b>Course</b>	<b>Units (8 units)</b>
Environmental Microbiology	ENVS/MIC 425	3
Environmental Microbiology Lab	ENVS/MIC 426	2
Limnology	ENVS/ECOL 442	3
Water Harvesting	ENVS/ECOL 454	3
Aquatic Plants & the Environment	ENVS/ECOL 474	4
Freshwater & Marine Algae	ENVS/ECOL 475	4
Principles of Ecotoxicology	ENVS 477	3
Principles of Ecotoxicology Lab	ENVS 477L	1
Air Pollution I: Gases	ATMO 469A	3
Air Pollution II: Aerosols	ATMO 469B	3
Synoptic Meteorology	ATMO 471	3
Atmospheric Electricity	ATMO 489	3
Conservation Biology	ECOL 406R	3
Environmentally Acquired Illnesses	EHS 420	3
Soil Ecology	ENVS 300	3
Introduction To Remote Sensing	GEOG/GIS/ENVS 330	3
Geographical Applications of Remote Sensing	GEOG/ENVS 483	3
Microbial Biogeochemistry and Global Change	ENVS/ECOL 410	3
Introduction to Human Health Risk Assessment	EHS/ENVS 418	3
Environmental Studies: Ideas and Institutions	EVS 260	3
Water, Environment, & Society	GEOG/EVS 304	3
Field Study in Geography Workshop	GEOG 397A	1
Environmental & Resource Geography	GEOG/EVS/HWRS/LAS 461	3
Physical Geology	GEOS 251	4
Glacial & Quaternary Geology	GEOS 453	3
Natural History of Disasters	HIST 358	3
Conservation Planning & Wildland Recreation	LAR 448	3
Environmental Law and Policy	LAW 454	3
Public International Environmental Law	LAW 459	3
Calculus II	MATH 129	3
Global Climate Change: Integrating Science, Policy and Decision Making	PA/PLG 461	3
The Economics & Social Connections to Natural Resources	PA 485	3
Environmental Land Use Planning	PLG 472	3
Rangeland Plant Communities of the West	RAM 382	3
Management & Restoration of Wildlands Vegetation	RAM 446	3
Dryland Ecohydrology and Vegetation Dynamics	RAM/RNR/ECOL/WSM 452	4
Rangeland Inventory & Monitoring	RAM 456A	3
Natural Resources Measurements	RNR 321	3
Conservation Planning & Wildland Recreation	RNR 448	3-4
Natural Resources Policy & Law	RNR 480	3



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Natural Resources Economics & Planning	RNR 485A	3
Conservation Biology: Field Studies in Developing Countries (Namibia)	RNR/ENVS 495F	6
Amazon Rainforest: Conservation Biology in Ecuador	RNR/ENVS 495G	3
Watershed Management	WSM 462	3
Wildland Water Quality	WSM 468	3

