



THE UNIVERSITY  
OF ARIZONA.

Interested in solving environmental problems and  
conserving the Earth's natural resources?

## B.S., Environmental Science



### The Biosphere

From microbes to plants, animals, and humans, biota interact with their physical and chemical environment. Apply biological principles to biodiversity, adaptation to global change, and habitat conservation, restoration, and rehabilitation.



### Soil, Air, and Water

Develop strategies to address difficult issues faced by civilization in its stewardship of Earth's physical resources, including soils, fresh waters, oceans, and the atmosphere.



### Leadership, Sustainability & Communication

Be a part of the response to air and water pollution, waste management, biodiversity, ecosystem and natural resource management, and climate change through development of environmental laws, regulations, and policies.



### Physical and Chemical Dynamics

Discover the intricacies of the chemical, physical, and hydrogeological processes of the environment and apply these principles to environmental conservation and solution of ecological challenges.

**For more information contact an advisor:**

**Dept. Soil Water Environmental Science**

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# Why major in Environmental Science?



**Top jobs in progressive fields.** Our graduates use their knowledge of the natural sciences to study, develop, guide, and implement policies and plans for managing and protecting the environment, natural resource and human health. Focus on the environment continues to grow, and employment of environmental scientists is expected to grow 15 percent in the next decade. Our majors work indoors and outdoors for private companies, government agencies, non-profit organizations, and advocacy groups.

**An outstanding learning environment.** The Environmental Science curriculum encompasses a broad range of disciplines, including soil science, chemistry, biology, microbiology, physics, geology, hydrology, and aquaculture. Teaching incorporates classroom, laboratory, and field experiences. Students receive personalized attention from faculty and advisors.

**Hands-on learning experiences.** Our majors are provided opportunities to do internships with prospective employers and to conduct research with top environmental science faculty. Students experience environmental science outdoors, in Arizona as well as in international settings. Practical field experiences in environmental monitoring and remediation are included in our dynamic curriculum.

**Have a global impact.** The Earth's ecosystems are comprised of soils, water, air, microbes, plants, and animals poised in a delicate balance, are impacted by human activities. You can be an integral part of the conservation, management, sustainability, protection, and restoration of these natural resources in the face of challenges presented by growing human populations, declining resources, and global climate change.

<b>General Education</b>	<b>Course</b>	<b>Units</b>
First Year Composition 1	ENGL 101	3
First Year Composition 2	ENGL 102	3
College Algebra Concepts & Applications	MATH 112	3
General Education, Tier 1	TRAD 1	3
General Education, Tier 1	TRAD 2	3
General Education, Tier 1	INDV 1	3
General Education, Tier 1	INDV 2	3
General Education, Tier 2	Humanities	3
General Education, Tier 2	Individuals & Societies	3
General Education, Tier 2	Arts	3
<b>Pre-major</b>	<b>Course</b>	<b>Units</b>
General Chemistry 1	CHEM 151	4
General Chemistry 2	CHEM 152	4
Introductory Biology I & II	ECOL 182R & MCB 181R	6
Introductory Physics I	PHYS 102/181	4
Introductory Microbiology	MIC 205A	3
<b>Environmental Science Core</b>	<b>Course</b>	<b>Units</b>
Introduction to Soil Science AND Laboratory	ENVS 200 AND 201	4
Fundamentals of Environ Science & Sustainability	ENVS 210	3
Critical Zone Science	ENVS 270	3
Quantitative Skills in Natural Sciences	ENVS 275	3
Pollution Science	ENVS 305	3
Environmental Chemistry OR Environmental Organic Chemistry OR Environmental Soil & Water Chemistry	ENVS 340 OR ENVS 464 OR ENVS 462	3
Environmental Physics	ENVS 420	3
Environmental Microbiology OR Aquatic Plants & the Environment OR Freshwater & Marine Algae	ENVS 425 OR ENVS 474 OR ENVS 475	3-4
Environmental Assessment for Contaminated Sites	ENVS 480	3
<b>Career Preparation</b>	<b>Course</b>	<b>Units</b>
Careers in Environmental Science	ENVS 195A	1
Individual Studies: Directed Research, Internship, Teaching workshop; Independent Study, Practicum, or Thesis	ENVS 392, 393, 397A, 399, 399H, OR 492	1-3
Scientific Writing OR Translating Environmental Science	ENVS 408 OR ENVS 415	3
Environ Monitoring & Remediation OR Senior Capstone Research	ENVS 430 R/L OR ENVS 498A/B	4
<b>Sub-plan requirements and electives</b>		<b>26</b>



## Choose 1 Sub-Plan

Sub-plan: The Biosphere		
Group I: Required courses, take all (10 to 12 units)	Course	Units
Elements of Calculus OR First Semester Calculus OR Calculus I	MATH 113 MATH 122B MATH 125	3-4
Organic Chemistry 1	CHEM 241A & 243A	4
Natural Resources Ecology OR Ecology	RNR 316 OR ECOL 302	3-4
Group II: Select a minimum of 10 units	Course	Units
Organic Chemistry 2	CHEM 241B	3
Environmental Microbiology	ENVS 425	3
Environmental Microbiology Laboratory	ENVS 426	2
Aquatic Plants & the Environment	ENVS 474	4
Biochemistry	BIOC 462A	4-5
Ecology	ECOL 302	4
Genetics	ECOL 320	4
Evolutionary Biology	ECOL 335	4
Freshwater & Marine Algae	ENVS 475	4
Group III: Select a minimum of 6 units	Course	Units
Living in Symbiosis	ECOL 310	3
Conservation Biology in the Field	ECOL 406 L	1
Conservation Biology	ECOL 406 R	3
Soil Fertility & Plant Nutrition	ENVS 316	3
Soil Genesis, Morphology & Classification	ENVS 431	3
Biodegradation of Pollutants in Soil & Groundwater	ENVS 440	3
Watersheds & Ecosystem Function	ENVS 456A	3
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Physical Geology	GEOS 251	4
Ocean Sciences	GEOS 412A	4
Global Change	GEOS 478	3
Watershed Hydrology OR Principles of Hydrology	HWRS 460A OR HWRS 249A/B OR 250	3-4
Introduction to Statistics and Biostatistics OR Intro to Stat Methods OR Theory of Statistics OR Introduction to Biostatistics	MATH 263 OR MAT 363 OR MAT 466 OR BIOS 376	3
Molecular Biology	MCB 411	3-4
Recombinant DNA Methods & Applications	MCB 473	4
Microbial Physiology	MIC 328R	3
Microbiological 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
Dryland Ecohydrology and Vegetation Dynamics	RNR 452	4
Cons. Biology: Field Studies in Developing Countries OR Amazon Rainforest Cons. Biology in Ecuador	RNR 495F RNR 495G	3 - 6
Limnology	WFCS 441	4

<b>Sub-plan: Soil, Air, and Water</b>		
<b>Group I: Required courses, take all (9-10 units)</b>	<b>Course</b>	<b>Units</b>
Elements of Calculus OR First Semester Calculus OR Calculus I	MATH 113 MATH 122B MATH 125	3-4
Soil Ecology of Sustainable Plant Systems OR Soil Fertility & Plant Nutrition OR Sustainable Mgt of Arid Lands & Salt-Affected Soils OR Soil Genesis, Morphology & Classification OR Soil Physics	ENVS 3XX OR ENVS 316 OR ENVS 401 OR ENVS 431 OR ENVS 470	3
Introduction to Statistics and Biostatistics OR Intro to Stat Methods OR Theory of Statistics OR Introduction to Biostatistics	MATH 263 OR MAT 363 OR MAT 466 OR BIOS 376	3
<b>Group II: Select a minimum of 9 units</b>	<b>Course</b>	<b>Units</b>
Fundamentals of Atmospheric Sciences	ATMO 436A	3
Organic Chemistry 1	CHEM 241A & 243A	4
Soil Fertility & Plant Nutrition	ENVS 316	3
Sustainable Management of Arid Lands & Salt-Affected Soils	ENVS 401	3
Soil Genesis, Morphology & Classification	ENVS 431	3
Green Infrastructure	ENVS 450	3
Water Harvesting	ENVS 454	3
Soil & Water Conservation	ENVS 461	3
Environmental Soil and Water Chemistry	ENVS 462	
Soil Physics	ENVS 470	3
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Principals of Stratigraphy & Sedimentation	GEOS 302	4
Ocean Sciences	GEOS 412A	4
Geomorphology	GEOS 450	4
Watershed Hydrology OR Principles of Hydrology	HWRS 460A OR HWRS 250 OR 249A/B	3-4
Introductory Physics II OR Introductory Mechanic OR Introductory Optics and Thermodynamics	PHYS 103 OR PHYS 141 OR PHYS 142	3-4
Global Change	GEOS 478	3
Applications of Geographic Information Systems OR Geographic Information Systems for Natural & Social Sci.	RNR 403 OR RNR 417	3
Dryland Ecohydrology and Vegetation Dynamics	RNR 452	4
<b>Group III: Select a minimum of 8 units</b>	<b>Course</b>	<b>Units</b>
Physical Climatology: Mechanisms of Change	ATMO 421	3
Air Pollution I: Gases	ATMO 469a	3
Air Pollution II: Aerosols	ATMO 469b	3
Synoptic Meteorology	ATMO 471	3
Atmospheric Electricity	ATMO 489	3
Remote Sensing of Planet Earth	ATMO 490	3
Conservation Biology in the Field	ECOL 406 L	1
Conservation Biology	ECOL 406 R	3
Fresh Water & Marine Algae	ECOL 475	4

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<b>Sub-plan: Soil, Air, and Water</b>		
<b>Group III continued</b>	<b>Course</b>	<b>Units</b>
Introduction to Remote Sensing	ENVS 330	3
Introduction to Human Health Risk Assessment	ENVS 418	3
Environmental Microbiology	ENVS 425	3
Environmental Microbiology Laboratory	ENVS 426	2
Watersheds & Ecosystem Function	ENVS 456A	3
Aquatic Plants & the Environment	ENVS 474	4
Water, Environment, & Society	GEOG 304	3
Field Study in Geography Workshop	GEOG 397A	1
Biogeography	GEOG 438	3
Environmental & Resource Geography	GEOG 461	3
Physical Geology	GEOS 251	4
Glacial & Quaternary Geology	GEOS 453	3
Calculus II	MATH 129	3
Rangeland Plant Communities of the West	RAM 382	3
Management & Restoration of Wildlands Vegetation	RAM 446	3
Rangeland Inventory & Monitoring	RAM 456a	3
Natural Resources Measurements	RNR 321	3
Conservation Planning & Wildland Recreation	RNR 448	2-3
Environmental Land Use Planning	RNR 472	3
Natural Resources Policy & Law	RNR 480	3
Natural Resources Economics & Planning	RNR 485A	3
Conservation Biology: Field Studies in Developing Countries OR Amazon Rainforest Conservation Biology in Ecuador	RNR 495F OR RNR 495G	3 - 6
Limnology	WFSC 441	4
Dryland Ecohydrology & Vegetation Dynamics	WSM 452	3
Watershed Management	WSM 462	3
Wildland Water Quality	WSM 468	3

<b>Sub-plan: Leadership, Sustainability and Communication</b>		
<b>Group I: Required courses, take 6 units</b>	<b>Course</b>	<b>Units</b>
Ecosystem Health and Justice OR Toxic! The Anthropology of Exposure OR Reclamation and Redevelopment of Impacted Lands OR Environment, Health, and Society	ENVS 310 OR ANTH 373 OR ENVS 482 OR SOC 350	3
Translating Environmental Science OR Scientific Writing for Environmental, Agricultural & Life Sciences OR Communicating Knowledge in Agriculture & the Life Sciences OR Communication and Public Relations OR Advances in Health Communication OR Environmental Journalism OR Issues in Covering Science and the Environment OR Science Journalism	ENVS 415 OR ENVS 408 OR AGTM 422 OR COMM 313 OR COMM 469 OR JOUR 455 OR JOUR 465 OR JOUR 472	3
<b>Group II: Select a minimum of 11 units</b>	<b>Course</b>	<b>Units</b>
Globalization, the Environment, and Indigenous Religions OR Ecological Anthropology OR Environmental Archaeology	ANTH 428A OR ANTH 307 OR ANTH 332	3
Southwest Land & Society	ANTH 418	3
Toxic! The Anthropology of Exposure	ANTH 373	3
Intro to Human Risk Assessment	ENVS 418	3
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Teaching Workshop OR Teaching Geosciences OR Undergrad. Teaching Training in Ecology and Evolutionary Biology OR Environmental Learning	ENVS 397A OR GEOS 397A OR ECOL 497A OR TLS 431	1 – 5
Integrating Technology into the Curriculum OR Teaching with New Technologies	ETCV 310 OR TLS 318	3
U.S. Environmental History	HIST 355	3
Global Environmental History	HIST 356	3
Environmental Ethics	PHIL 323	3
Environmental Psychology	PSYC 374	3
Environmental Sociology	SOC 307	3
Social Movements & Activism	SOC 313	3
Environment, Health, and Society	SOC 350	3
<b>Group III: Select a minimum of 9 units</b>	<b>Course</b>	<b>Units</b>
Political Ecology	ANTH 424A	3
Environmental Economics	AREC 373	3
Economics of Policy Analysis	AREC 464	3
Environmental Law & Economics	AREC 476	3
Economics of Water Management & Policy	AREC 479	3
Weather, Climate, & Society	ATMO 336	3
Physical Climatology: Mechanisms of Change	ATMO 421C	3
Conservation Biology	ECOL 406 R	3
Conservation Biology: Field Studies in Namibia	RNR 495F	3
Environmental & Resource Geography	GEOG 461	3

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<b>Sub-plan: Leadership, Sustainability and Communication</b>		
<b>Group III continued</b>	<b>Course</b>	<b>Units</b>
Introduction to Dendrochronology	GEOS 439A	4
Introduction to Quaternary Ecology	GEOS 462	3
Global Change	GEOS 478	3
Elements of Calculus OR First Semester Calculus OR Calculus I	MATH 113 OR MATH 122B OR MATH 125	3-4
Introduction to Statistics and Biostatistics OR Intro to Stat Methods OR Theory of Statistics OR Introduction to Biostatistics	MATH 263 OR MAT 363 OR MAT 466 OR BIOS 376	3
Global Climate Change: Integrating Sci, Policy, & Decision Making	PA 461	3
Formation of Public Policy	PA 480	3
Environmental Policy	PA 481	3
Adaptation to Climate Change	RNR 440	3
Environmental Land Use Planning	RNR 472	3
Natural Resources Policy & Law	RNR 480	3
Natural Resources Economics & Planning	RNR 485A	4



<b>Sub-plan: Physical and Chemical Dynamics</b>	<b>Course</b>	<b>Units</b>
<b>Group I: Required courses, take all (10-11 units)</b>	<b>Course</b>	<b>Units</b>
First Semester Calculus OR Calculus I	MATH 122B OR MATH 125	3-4
Organic Chemistry 1	CHEM 241A & 243A	4
Introduction to Statistics and Biostatistics OR Intro to Stat Methods OR Theory of Statistics OR Introduction to Biostatistics	MATH 263 OR MAT 363 OR MAT 466 OR BIOS 376	3
<b>Group II: Select a minimum of 10 units</b>	<b>Course</b>	<b>Units</b>
Biochemistry OR Foundations in Biochemistry	BIOC 462A OR BIOC 384	4-5
Environmental Chemistry	ENVS 340	3
Environmental Soil & Water Chemistry	ENVS 462	3
Environmental Organic Chemistry	ENVS 464	3
Soil Physics	ENVS 470	3
Principles of Analysis I	CHEM 322	2
Principles of Analysis I Laboratory	CHEM 323	1
Organic Chemistry 2	CHEM 241B	3
Physical Chemistry	CHEM 480A	3
Physical Geology	GEOS 251	4
Watershed Hydrology OR Principles of Hydrology	HWRS 460A OR HWRS 250 OR 249A/B	3-4
Hydrogeology	HWRS 431	4
Hydrology	HWRS 423	3
Calculus II	MATH 129	3
Introductory Physics II OR Introductory Mechanic OR Introductory Optics and Thermodynamics	PHYS 103 OR PHYS 141 OR PHYS 142	3-4
Watershed Hydrology	WSM 460	3
<b>Group III: Select a minimum of 6 units</b>	<b>Course</b>	<b>Units</b>
Sustainable Management of Arid Lands & Salt-Affected Soils	ENVS 401	3
Environmental Microbiology	ENVS 425	3
Soil Genesis, Morphology & Classification	ENVS 431	3
Biodegradation of Pollutants	ENVS 440	3
Reclamation and Redevelopment of Impacted Lands	ENVS 482	3
Air Pollution I: Gases	ATMO 469A	3
Air Pollution II: Aerosols	ATMO 469B	3
Environmental & Water Engineering	CHEE 370R	3
Environmental & Water Engineering Laboratory	CHEE 370L	1
Water Chemistry for Engineers	CHEE 400R	3
Water Chemistry for Engineers Laboratory	CHEE 400L	1
Introduction to Hazardous Waste Management	CHEE 478	3
Inorganic Chemistry	CHEM 404A	3
Introduction to Geochemistry	GEOS 400	3
Chemistry of the Solar System	PTYS 407	3

# Environmental Science/Soil & Water Science Minors

Students may select a Minor in Environmental Science or Soil and Water Science while majoring in a complementary alternate field of study. This minor requires twenty units, regardless of department guidelines for minors. A minimum of nine units must be unique to this minor.

<b>Environmental Science Minor</b>		
	<b>Course</b>	<b>Units</b>
<b>General Sciences Courses (Select 14 units)</b>		
Careers in Environmental Science	ENVS 195A	1
Introduction to Soil Science	ENVS 200	3
Soils Laboratory	ENVS 201	1
Fundamentals of Environmental Science & Sustainability	ENVS 210	3
Water Harvesting	ENVS 454	3
Introductory Biology	MCB 181R	3
<b>Upper Division Courses (Select 6 units from the following)</b>	ENVS, AREC, ATMOS, HIST, HWRS, POL, RNR	6
TOTAL:		20
<b>Soil &amp; Water Science Minor</b>		
	<b>Course</b>	<b>Units</b>
<b>General Sciences Courses (11 units)</b>		
Introduction to Soil Science	ENVS 200	3
Soils Laboratory	ENVS 201	1
Physical Geology	GEOS 251	4
Water Harvesting	ENVS 454	3
<b>Upper Division Courses (Select 9 units)</b>		
Soil Fertility & Plant Nutrition	ENVS 316	3
Sustainable Management of Arid Lands & Salt-Affected Soils	ENVS 401	3
Soil Genesis, Morphology & Classification	ENVS 431	3
Soil & Water Conservation	ENVS 461	3
Soil Physics	ENVS 470	3
Pollution Science	ENVS 305	3
Environmental Chemistry	ENVS 340	3
Environmental Physics	ENVS 420	3
Environmental Soil and Water Chemistry	ENVS 462	3
TOTAL:		20

# Environmental Science Major

## Four-Year Sample Plan

SEMESTER 1	15	SEMESTER 2	15
CALS 195A Cultivating Academic Learning Strategies	1	ENGL 102 First-Year Composition	3
ENGL 101 English Composition	3	Language	4
Language	4	ENVS 200 & 201 Intro Soil Science & Lab	4
ENVS 210 Fund Environ Sci & Sustainability	3	CHEM 152 General Chemistry II	4
CHEM 151 General Chemistry	4		
SEMESTER 3	15	SEMESTER 4	16
ENVS 275 Quantitative Skills for Natural Sciences	3	MIC 205A General Microbiology	3
MCB 181R Introductory Biology I	3	ENVS 270 Critical Zone Science	3
Tier I Gen-Ed	3	ENVS 195A Careers in Environ Science	1
Subplan class	3	Subplan class	3
ENVS 480 Environ Assessment for Contaminated Sites	3	Tier I Gen-Ed	3
		Tier I Gen-Ed	3
SEMESTER 5	15	SEMESTER 6	16
ECOL 182R Introductory Biology II	3	ENVS 305 Pollution Science	3
ENVS 408 Scientific Writing	3	PHYS 102/181 Introductory Physics I & Lab	4
Tier I Gen-Ed	3	Sub-plan class	3
Subplan class	3	Sub-plan class	3
Subplan class	3	Tier II Gen-Ed	3
SEMESTER 7	15	SEMESTER 8	14 - 16
ENVS 425 Environmental Microbiology	3	ENVS 462 Environ Soil & Water Chemistry	3
ENVS 420 Environmental Physics	3	ENVS 430R/L Environ Monitoring & Remediation	4
Tier II Gen-Ed	3	Tier II Gen-Ed	3
Subplan class	3	Subplan class	3
Subplan class	3	ENVS 393 Internship	1 - 3

# Career Opportunities for Environmental Science Majors

The knowledge gained of environmental pollution problems, pollution and remediation laws and policies, mathematics, chemistry and biology gained from a degree in environmental science provides a strong career foundation. The society and environment concentration prepares students with the knowledge needed to address fundamental and applied problems related to human inhabited parts of the Earth. Graduates in this concentration may work as researchers, consultants, project managers, communications officers, educators, or environmental activists. This concentration is also excellent preparation for graduate studies in chemistry, geography, or environmental health. Some of the job titles listed below may require an advanced degree.

## ***Potential Career Areas:***

- Research
- Consulting
- Policy analysis and design
- Regulation and enforcement
- Conservation/restoration
- Development
- Public Relations
- Activism

## ***Sample Employers:***

- Government agencies
- U.S. Geological Survey
- Nonprofit organizations
- Public awareness campaigns
- Research institutes
- Municipal councils
- Water treatment facilities
- Development firms

## ***Sample Job Titles and National Salary Ranges:***

Job Title	Salary Range
Ecologist	\$39,179 - \$62,297
Environmental Activist	\$30,000 - \$40,000
Environmental Chemist	\$41,080 - \$57,190
Environmental Compliance Specialist	\$40,000 - \$70,000
Environmental Educator, Non-school Setting	\$18,000 - \$45,000
Environmental Health and Safety Officer	\$31,610 - \$94,460
Environmental Health Inspector	\$34,000 - \$65,000
Environmental Planner	\$35,610 - \$86,800
Environmental Protection Agency Special Agent	\$27,705 - \$72,391
Environmental Protection Technician	\$26,330 - \$41,240
Hazardous Waste Management Specialist	\$62,278 - \$94,416
Pollution Control Technician	\$21,500 - \$35,800
Public Information Officer	\$30,000 - \$65,000
Research Associate	\$21,000 - \$61,000
Soil/Water Conservationist	\$38,350 - \$61,100