THE UNIVERSITY OF ARIZONA®

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

B.S., Environmental Science

Biology

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.

Land, 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.

Society and Environment

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.

Physics and Chemistry

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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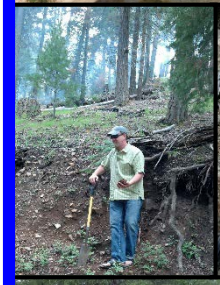
520-621-1606

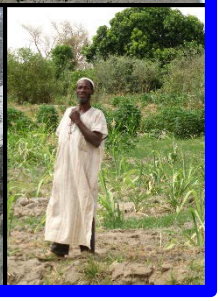
Why major in Environmental Science?









- **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.

General Education	Course	Units
First Year Composition 1	ENGL 101	3
First Year Composition 2	ENGL 102	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
Foreign language	Various	0 - 8
General Science Core	**Course**	**Units**
General Chemistry 1	CHEM 151	4
General Chemistry 2	CHEM 152	4
Calculus 1	MATH 122A/B (124 or 125)	3 - 5
Organic Chemistry 1	CHEM 241A & 243A	4
Introduction to Statistics and Biostatistics OR Intro to Stat Methods OR Stat Inference OR Intro to Statistics	MATH 263 OR MAT 363 OR MGMT 276 OR SBS 200	3
Introductory Biology	ECOL 182R & MCB 181R	6
Introductory Microbiology	MIC 205A	3
Introductory Physics 1	PHYS 102 & 181	4
Environmental Science Core	**Course**	**Units**
Environmental Microbiology OR Aquatic Plants & the Environment OR Freshwater & Marine Algae	ENVS 425 OR ENVS 474 OR ECOL 475	3 - 4
Environmental Physics OR Soil Physics	ENVS 420 OR ENVS 470	3
Introduction to Soil Science & Soil Laboratory	ENVS 200 & 201	4
Environmental Soil & Water Chemistry OR Environmental Organic Chemistry OR Fundamentals of Water Chemistry OR Environmental Chemistry	ENVS 462 OR ENVS 464 OR HWRS 417A OR ENVS 340	3
Pollution Science	ENVS 305	3
Intro to Human Health Risk Assessment	ENVS 418	3
Physical Geology	GEOS 251	4
Watershed Hydrology OR Principles of Hydrology	WSM 460A OR HWRS 250 OR 249A/B	3 - 4
Career Preparation	**Course**	**Units**
Careers in Environmental Science	ENVS 195A	1
Fundamentals of Environ Science & Sustainability	ENVS 210	3
Individual Studies: Directed Research, Internship, Teaching workshop; Independent Study, Practicum, Thesis	ENVS 392; 393; 399; 492; 494 398; 398H	1-3
Scientific Writing for Environmental Sciences OR Translating Environmental Science OR Communicating Knowledge in Ag & Life Sciences	ENVS 409 OR ENVS 415 OR AGTM 422	3
Senior Capstone – Environ Monitoring & Remediation OR Soil & Water Conservation	ENVS 430 R/L OR ENVS 461	4 3
Sub-plan requirements and electives		18

Choose 1 Sub-Plan

Sub-plan: Biology	Course	Units
Required Courses: Select a minimum of 12 units		
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	ECOL 475	4
Electives: Total sub-plan units must be at least 18	**Course**	**Units**
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
Rainforest Conservation Biology in Ecuador	ENVS 495F	3
Living in Symbiosis	ECOL 310	3
Ocean Sciences	GEOS 412A	4
Global Change	GEOS 478	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
Conservation Biology	ECOL 406R	3
Conservation Biology: Field Studies in Namibia	RNR 495F	6
Limnology	WFCS 441	4

Sub-plan: Land, Air, and Water	Course	Units
Required Courses: Select a minimum of 12 units		
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
Water Harvesting	ENVS 454	3
Soil & Water Conservation	ENVS 461	3
Soil Physics	ENVS 470	3
Fundamentals of Atmospheric Sciences	ATMO 436A	3
Principals of Stratigraphy & Sedimentation	GEOS 302	4
Ocean Sciences	GEOS 412A	4
Geomorphology	GEOS 450	4
Global Change	GEOS 478	3
Calculus II	MATH 129	3
Applications of Geographic Information Systems	RNR 403	3
Geographic Information Systems for Natural & Social Sciences	RNR 417	3
Watershed Hydrology	WSM 460A	3
Electives: Total sub-plan units must be at least 18	**Course**	**Units**
Introduction to Remote Sensing	ENVS 330	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
Rainforest Conservation Biology in Ecuador	ENVS 495F	3
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	ECOL 406R	3
Conservation Biology in the Field	ECOL 406L	1
Fresh Water & Marine Algae	ECOL 475	4
Water, Environment, & Society	GEOG 304	3
Biogeography	GEOG 438	3
Environmental & Resource Geography	GEOG 461	3
Field Study in Geography Workshop	GEOG 397A	1
Glacial & Quaternary Geology	GEOS 453	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 Namibia	RNR 495F	6
Limnology	WFSC 441	4
Dryland Ecohydrology & Vegetation Dynamics	WSM 452	3
Watershed Management	WSM 462	3
Wildland Water Quality	WSM 468	3

Sub-plan: Environment and Society	Course	Units
Required Courses: Select a minimum of 12 units		
Translating Environmental Science	ENVS 415	3
Communicating Knowledge in Agriculture & the Life Sciences	AGTM 422	3
Environmental Archaeology	ANTH 332	3
Environmental Law & Economics	AREC 476	3
Introduction to Dendrochronology	GEOS 439A	4
Introduction to Quaternary Ecology	GEOS 462	3
Global Change	GEOS 478	3
U.S. Environmental History	HIST 355	3
Global Environmental History	HIST 356	3
Environmental Journalism	JOUR 455	3
Environmental Policy	PA 481	3
Environmental Ethics	PHIL 323	3
Natural Resources Policy & Law	RNR 480	3
Teaching Science	STCH 250	3
Electives: Total sub-plan units must be at least 18	**Course**	**Units**
Teaching Workshop	ENVS 397A	3 – 4
Rainforest Conservation Biology in Ecuador	ENVS 495F	3
Ecological Anthropology	ANTH 307	3
Southwest Land & Society	ANTH 418	3
Political Ecology	ANTH 424A	3
Environmental Economics	AREC 373	3
Economics of Policy Analysis	AREC 464	3
Economics of Water Management & Policy	AREC 479	3
Weather, Climate, & Society	ATMO 336	3
Physical Climatology: Mechanisms of Change	ATMO 421C	3
Communication & Conflict Management	COMM 411	3
Conservation Biology	ECOL 406R	3
Conservation Biology in the Field	ECOL 406L	1
Learning in the Schools	ED P 310	3
Research in Education	ED P 340	3
Advanced Composition	ENGL 306	3
Arizona and the Southwest	GEOG 408	3
Environmental & Resource Geography	GEOG 461	3
Science Journalism	JOUR 472	3
Engineering Sustainable Development	MNE 422	3
Bureaucracy, Politics, & Policy	PA 406	3
Global Climate Change: Integrating Sci, Policy, & Decision Making	PA 461	3
Formation of Public Policy	PA 480	3
Environmental Psychology	PSYC 374	3
Adaptation to Climate Change	RNR 440	3
Environmental Land Use Planning	RNR 472	3
Natural Resources Economics & Planning	RNR 485A	4
Conservation Biology: Field Studies in Namibia	RNR 495F	6
Social Movements & Activism	SOC 313	3

Sub-plan: Physics and Chemistry	Course	Units
Required Courses: Select a minimum of 12 units		
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
Physical Chemistry	CHEM 480A	3
Hydrogeology	HWRS 431	4
Hydrology	HWRS 423	3
Calculus II	MATH 129	3
Watershed Hydrology	WSM 460	3
Electives: Total sub-plan units must be at least 18	**Course**	**Units**
Environmental Chemistry	ENVS 340	3
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 in Soil & Groundwater	ENVS 440	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.

Environmental Science Minor	Course	Units
General Sciences Courses (Select 14 units)		
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 & Sustainability	GEOG 468	3
Introductory Biology	MCB 181R	3
Upper Division Courses (Select 6 units from the following)	ENVS, AREC, ATMOS, HIST, HWRS, POL, RNR	6
TOTAL:		20
Soil & Water Science Minor	**Course**	**Units**
General Sciences Courses (11 units)		
Introduction to Soil Science	ENVS 200	3
Soils Laboratory	ENVS 201	1
Physical Geology	GEOS 251	4
Watershed Management	WSM 460A	3
Upper Division Courses (Select 9 units)		
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
TOTAL:		20

Environmental Science Major

Four-Year Sample Plan

SEMESTER 1	16	SEMESTER 5	16
ENGL 101 English Composition	3	ENVS 408 Scientific Writing	3
ENVS 210 Fund Environ Sci & Sustainability	3	ENVS 474 Aquatic Plants & Environment	4
CHEM 151General Chemistry	4	ENVS 420 Environmental Physics	3
TIER I	3	ENVS 418 Intro to Risk Assessment	3
TIER I	3	Tier II	3
SEMESTER 2	**15**	**SEMESTER 6**	**15**
ENVS 200 Intro Soil Science	3	ENVS 305 Pollution Science	3
ENVS 201 Soils Laboratory	1	ENVS 462 Environ Soil & Water Chemistry	3
CHEM 152 General Chemistry II	4	MATH 263 Intro Statistics/Biostatistics	3
ENVS 195A Careers in Environ Science	1	MIC 205A General Microbiology	3
ENG 102 First-Year Composition	3	TIER II	3
TIER I	3		
SEMESTER 3	**15**	**SEMESTER 7**	**15**
CHEM 241A Organic Chemistry	3	HWRS 250 Principles of Hydrology	3
CHEM 243A Organic Chemistry Lab	1	Sub-plan class	3
MATH 122A/B Calculus	5	Sub-plan class	3
MCB 181R Introductory Biology I	3	Sub-plan class	3
TIER I	3	Tier II	3
SEMESTER 4	**14**	**SEMESTER 8**	**14**
ECOL 182R Introductory Biology II	3	ENVS 430R/L Environ Monitoring & Remed	4
PHYS 102 Introductory Physics I	3	ENVS 493 Internship	1
PHYS 181 Introductory Physic Laboratory I	1	Sub-plan class	3
GEOS 251 Physical Geology	4	Sub-plan class	3
Sub-plan class	3	Elective	3

Career Opportunities for Environmental Science Majors

Biotech Industry-

- Greenhouse or field manager
- Research technician
- Biological supplies product developer

Education and Academia-

- Professor
- Extension agent or specialist
- Technical staff
    - lab manager
    - researcher
- School teacher or administrator
- Herbarium or living collections curator
- Greenhouse manager

Landscape Management-

- Landscape contractor
- Sod and seed production manager
- Sports turf (Athletic fields) manager
- Golf course superintendents
- Parks grounds supervisor
- Testing or consulting service contractor

Publishing-

- Science editor
- Science writer
- Technical writers

Professional Societies-

- Scientific society director, associate/administrator

Sales and Private Industry-

- Biotech or agricultural chemical and equipment sales representative
- Nursery owner or manager
- Plant pathologist
- Microbiologist
- Epidemiologist
- Agricultural engineer
- Environmental scientist

Government-

- Research director or administrator
- National, state and local government state conservation and wildlife agent
- Agricultural inspector (USDA)

Science and Society/ Public Policy-

- Horticultural scientist
- Food Scientist
- Soil scientist
- Forester or urban forestry manager
- Arborist
- Soil and water conservationist
- Botanical garden director, scientist, educational program coordinator
- Government or industry policy advocate
    - conservation & environmental policy
    - Agricultural policy
    - Science policy

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