

ENVIRONMENTAL SCIENCE

Bachelor of Science in Environmental Science

An Environmental Science degree at Missouri S&T commences with a first-year seminar course that is taken concurrently with an introductory environmental science course, creating familiar student cohorts that can support and motivate one another through the program. Throughout their four years in the program, students are trained in five core areas: economics, biology, geology, environmental engineering, and humanities. In addition, they build foundational skills in mathematics, physical science, and communications. As they progress through the program, students increasingly connect ideas from among and within core areas to build their understanding of the integrated multidisciplinary concepts in environmental science. During their junior and senior years, students will be able to customize their degrees by selecting from a diverse array of elective courses within core areas. The degree's flexible upper division elective choices also allow students to specialize and earn minors in core areas if they choose to do so.

Students apply the skills they learn in the classroom in hands-on laboratory and field courses. Students will finish their senior year with a capstone course that will be designed to engage them in professional development, connect them to career opportunities, hone their research and presentation skills through hands-on projects, and foster lifelong collegial relationships with their peers and instructors through intensive group work.

This curriculum benefits from a flexible design that allows students who may be transitioning from other programs on campus to complete the program in a timely manner. In addition, the degree creates opportunities for students to complete multiple minors within the degree, adding focus and strength to the interdisciplinary foundation. Students should choose free electives that, along with required courses, fulfill the general education requirements applicable to the student's catalog year.

Freshman Year

First Semester	Credits	Second Semester	Credits
BIO SCI 1173	3	ENGLISH 1160	3
ENV SCI 1110	1	CHEM 1320 or GEOLOGY 3410	3
CHEM 1310	4	BIO SCI 1223	3
CHEM 1100	1	BIO SCI 1229	1
CHEM 1319	1	MATH 1212, or 1211, or 1214	4
ECON 1100	3		
ENGLISH 1120	3		
	16		14

Sophomore Year

First Semester	Credits	Second Semester	Credits
GEOLOGY 1110	3	BIO SCI 2263	3
ECON 4440 or MIN ENG 4523	3	HISTORY 1300 or 1310	3
ENV ENG 2601 or CIV ENG 2601	3	ENV ENG 2602 or CIV ENG 2602	3
PHYSICS 1145 or 1135	4	GEO ENG 3148	3
POL SCI 1200	3	CIV ENG 5640 or ENV ENG 5640	3
	16		15

Junior Year

First Semester	Credits	Second Semester	Credits
PHILOS 1130	3	HISTORY 4470, or 2510, or 3530, or 3510	3

GEO ENG 5331	3	GEOLOGY 2611	3
ENV ENG 5642 or CIV ENG 5642	3	PHILOS 4350	3
ECON 4540 or MIN ENG 4524	3	STAT 3425, or 3115, or GEO ENG 4115	3-4
BIO SCI 4313	3	BIO SCI 2223	3
	15		15-16

Senior Year

First Semester	Credits	Second Semester	Credits
GEOLOGY 4310, or GEO ENG 2536, or GEO ENG 5144	3	HUMANITIES AND FINE ARTS ELECTIVE	3
FREE ELECTIVES	2	ENV SCI 4028	3
UPPER DIVISION ELECTIVES ¹	9	UPPER DIVISION ELECTIVES ¹	9
	14		15

Total Credits: 120-121

¹ See Upper Division Elective Course List

Upper Division Elective Course List

BIO SCI 2242	Cave Biology	2
BIO SCI 2252	Vegetation of the Ozarks	2
BIO SCI 2264	Field Ecology	2
BIO SCI 2372	Issues in Public Health	3
BIO SCI 2383	Plant Biology	3
BIO SCI 2389	Plant Biology Laboratory	1
BIO SCI 3353	Comparative Vertebrate Anatomy	4
BIO SCI 3363	Ecophysiology	3
BIO SCI 4099	Undergraduate Research	1-3
BIO SCI 4316	Introduction to Geomicrobiology	3
BIO SCI 4363	Freshwater Ecology	3
BIO SCI 4369	Freshwater Ecology Laboratory	1
BIO SCI 4383	Toxicology	3
BIO SCI 4423	Introduction to Astrobiology	3
BIO SCI 4563	Global Ecology	3
BIO SCI 4663	Animal Behavior	3
BIO SCI 5423	Advanced Biodiversity	3
BIO SCI 5443	Population and Conservation Genetics	3
CHEM 4710	Principles Of Environmental Monitoring	3
CIV ENG 5605	Environmental Systems Modeling	3
CIV ENG 5630	Remediation of Contaminated Groundwater and Soil	3
CIV ENG 5635	Phytoremediation and Natural Treatment Systems: Science and Design	3
CIV ENG 5650	Public Health Engineering	3
CIV ENG 5660	Introduction To Air Pollution	3
CIV ENG 5662	Air Pollution Control Methods	3
CIV ENG 5665	Indoor Air Pollution	3
ECON 4085	Internship	0-6
ECON 4641	Foundations of Sustainability	3
ECON 4642	Introduction to Global Eco- and Social-preneurship and Innovation	3
ECON 4643	Ethical Problems in a Global Environment	3
ECON 5644	Creativity, Innovation, and Sustainability	3
ENV ENG 3615	Water And Wastewater Engineering	3
ENV ENG 4010	Senior Seminar: Engineering In A Global Society	1
ENV ENG 4099	Undergraduate Research	0-6
ENV ENG 4609	Research in Environmental Engineering	1
ENV ENG 5605	Environmental Systems Modeling	3
ENV ENG 5630	Remediation of Contaminated Groundwater And Soil	3

ENV ENG 5635	Phytoremediation and Natural Treatment Systems: Science and Design	3
ENV ENG 5650	Public Health Engineering	3
ENV ENG 5660	Introduction To Air Pollution	3
ENV ENG 5662	Air Pollution Control Methods	3
ENV ENG 5665	Indoor Air Pollution	3
GEO ENG 4099	Undergraduate Research	0-6
GEO ENG 4115	Statistical Methods in Geology and Engineering	3
GEO ENG 4276	Environmental Aspects Of Mining	3
GEO ENG 5085	Internship	0-15
GEO ENG 5146	Applications Of Geographic Information Systems	3
GEO ENG 5174	Geological Engineering Field Methods	3
GEO ENG 5233	Risk Assessment In Environmental Studies	3
GEO ENG 5239	Groundwater Remediation	3
GEO ENG 5276	Sustainability in Mining	3
GEO ENG 5320	Groundwater Modeling	3
GEO ENG 5332	Fundamentals of Groundwater Hydrology	3
GEO ENG 5556	Renewable Energy Systems	3
GEOLOGY 2096	Field Geology	3
GEOLOGY 2731	Introduction to Planetary Science	3
GEOLOGY 4085	Internship	3
GEOLOGY 4099	Undergraduate Research	0-6
GEOLOGY 4310	Remote Sensing Technology	3
GEOLOGY 4411	Hydrogeology	3
GEOLOGY 4431	Methods Of Karst Hydrogeology	3
GEOLOGY 4711	Paleoclimatology and Paleoecology	3
GEOLOGY 4721	Climate Change and Society	3
GEOLOGY 4841	Geological Field Studies	3
GEOLOGY 5681	Lidar Principles and Application	3
GEOLOGY 5741	Micropaleontology	3
MIN ENG 5742	Sustainability in Mining	3
POL SCI 3300	Principles Of Public Policy	3
POL SCI 4085	Political Science Internship	0-6
POL SCI 4320	The Politics of Innovation	3

Secondary Education Emphasis Area

You may earn a BS degree in environmental science from Missouri S&T and certification to teach at the secondary level in the schools of Missouri with this emphasis area. This program is approved by the Missouri Department of Elementary and Secondary Education. License reciprocity determinations outside of Missouri can be found at <https://teaching.missouri.edu/student/state-authorization/mst/licensure> (<https://teaching.missouri.edu/student/state-authorization/mst/licensure/>). This program can be completed in four academic years, and student teaching is arranged with public schools anywhere in the state. Students interested in this emphasis area should consult with the advisor for environmental science.

In order to successfully complete the emphasis area, students must attain at least a 2.5 GPA for all environmental science courses and a 3.0 education GPA required by the Missouri Department of Elementary and Secondary Education for teacher certification. Courses must fulfill the Missouri S&T general education requirements applicable to the student's catalog year.

Students must also meet all requirements listed under the teacher education website including passing the state-required assessments.

A degree in the emphasis area requires a minimum of 127 credit hours. The required courses are provided below.

Humanities: 12 semester hours		
ENGLISH 1120	Exposition And Argumentation	3

ENGLISH 1160	Writing And Research	3
or ENGLISH 3560	Technical Writing	
PHILOS 1130	How Should I Live? An Introduction to Ethics	3
PHILOS 4350	Environmental Ethics and Justice	3
Social Sciences: 18 semester hours		
HISTORY 1310	American History Since 1877	3
PSYCH 1101	General Psychology	3
PSYCH 3310	Developmental Psychology	3
ECON 1100	Principles Of Microeconomics	3
ECON 4440	Environmental And Natural Resource Economics	3
HISTORY 2510	History of Technology	3
or HISTORY 3510	Twentieth Century Technology And Society	
or HISTORY 3530	History of Science	
Mathematics/Physical Science: 12 semester hours		
MATH 1214	Calculus I	4-9
or MATH 1210 & MATH 1211	Calculus I-A and Calculus I-B	
PHYSICS 1505 & PHYSICS 1509	Introductory Astronomy and Astronomy Laboratory	4
PHYSICS 1145	College Physics I	4
or PHYSICS 1135	Engineering Physics I	
Statistics: 3 semester hours		
STAT 3425	Introduction to Biostatistics	3-4
or STAT 3113	Applied Engineering Statistics	
or STAT 3115	Engineering Statistics	
Biological Sciences: 13 semester hours		
BIO SCI 1223 & BIO SCI 1229	Biodiversity and Biodiversity Lab	4
BIO SCI 1173	Introduction to Environmental Sciences	3
BIO SCI 2223	General Genetics	3
BIO SCI 2263	Ecology	3
Chemistry: 9 semester hours		
CHEM 1100	Introduction To Laboratory Safety & Hazardous Materials	1
CHEM 1310	General Chemistry I	4
CHEM 1319	General Chemistry Laboratory	1
CHEM 1320	General Chemistry II	3
Civil, Architectural and Environmental Engineering: 9 semester hours		
ENV ENG 2601	Fundamentals of Environmental Engineering and Science	3
ENV ENG 2602	Biological Fundamentals Of Environmental Engineering	3
ENV ENG 5640	Environmental Law And Regulations	3
or ENV ENG 5642	Sustainability, Population, Energy, Water, and Materials	
Environmental Science: 1 semester hour		
ENV SCI 1110	Environmental Science Freshman Seminar	1
Geological Sciences/Geological and Petroleum Engineering: 12 semester hours		
GEO ENG 2536	Basic Weather	3
GEOLOGY 1110	Physical and Environmental Geology	3
GEOLOGY 2611	Physical Mineralogy And Petrology	3
GEO ENG 3148	Fundamentals Of Geographic Information Systems	3
Education: 38 semester hours		
EDUC 1074	Foundations of Education in a Diverse Society	3
EDUC 1104	Teacher Field Experience I	1
EDUC 1164	Teacher Field Experience II	2
EDUC 3170	Teaching Reading and Writing in Middle/High School	3
EDUC 3216	Instructional Literacy in the Content Area	3
EDUC 3280	Instructional Strategies in the Content Area	3
EDUC 3298	Teacher Field Experience III	1
EDUC 3340	Assessment of Student Learning	3
EDUC 4298	Student Teaching Seminar	1
EDUC 4299	Student Teaching	12
PSYCH 2300	Educational Psychology	3
or EDUC 2102	Educational Psychology	

PSYCH 4310	Psychology Of The Exceptional Child	3
or EDUC 2310	Education Of The Exceptional Child	

ENV SCI 1001 Special Topics (LAB 0.0 and LEC 0.0)

This course is designed to give the department an opportunity to test a new course.

ENV SCI 1110 Environmental Science Freshman Seminar (RSD 1.0)

An introduction to the study of environmental science at Missouri S&T. Students will become acquainted with faculty, facilities, and resources associated with the environmental science program at S&T. Students will also consider opportunities for personal and professional development in environmental sciences. Prerequisites: Environmental Science majors only.

ENV SCI 1173 Introduction to Environmental Sciences (LEC 3.0)

An introduction to environmental science, with an emphasis on biological aspects of current environmental problems. Topics range from chemical toxicity to global climate change. Environmental challenges facing local species and ecosystems will be emphasized. (Co-listed with Bio Sci 1173).

ENV SCI 1173 - MOTR BIOL 100: Essentials in Biology

ENV SCI 2001 Special Topics (LAB 0.0 and LEC 0.0)

This course is designed to give the department an opportunity to test a new course.

ENV SCI 3001 Special Topics (LAB 0.0 and LEC 0.0)

This course is designed to give the department an opportunity to test a new course.

ENV SCI 3213 One Health Basics (LEC 3.0)

One Health is based on the knowledge that the health of people is interlinked with the health of animals and the environment. In this course, we will explore these interconnections and common One Health issues such as illness spillover events, the growing problem of antibiotic resistance, and the impacts that contaminated water have on animals and people. Prerequisites: Bio Sci 1223. (Co-listed with Bio Sci 3213).

ENV SCI 4000 Special Problems (IND 0.0-6.0)

Problems or readings on specific subjects or projects in the program. Consent of instructor required.

ENV SCI 4001 Special Topics (LAB 0.0 and LEC 0.0)

This course is designed to give the department an opportunity to test a new course.

ENV SCI 4002 Cooperative Environmental Scientist Training (IND 0.0-6.0)

On-the-job experience gained through cooperative education with industry, with credit arranged through departmental cooperative advisor. Grade received depends on quality of reports submitted and work supervisor's evaluation.

ENV SCI 4010 Seminar (RSD 1.0)

Students will work in groups to propose, research, develop, complete, and present service-learning projects that are related to the environmental sciences. Prerequisites: Senior Standing.

ENV SCI 4028 Environmental Science Senior Capstone (LAB 1.0 and LEC 2.0)

This course challenges students to solve real-world environmental problems in a hands-on capacity. Students will learn environmental monitoring techniques and environmental reporting, and engage in professional development. This course fulfills experiential learning requirements through an industry-engaged project. Prerequisites: Senior standing. Environmental Science majors only.

ENV SCI 4099 Undergraduate Research (IND 0.0-6.0)

Designed for the undergraduate student who wishes to engage in research. Not for graduate credit. Not more than six credit hours for graduation credit. Subject and credit to be arranged with the instructor. Prerequisite: Consent of instructor.

ENV SCI 5001 Special Topics (LAB 0.0 and LEC 0.0)

This course is designed to give the department an opportunity to test a new course.