Environmental Science (ENV_SC)

**ENV_SC 1100: Introduction to Environmental Science**
This course provides an opportunity to develop an understanding of environment, physical and social causes of environmental problems, their impacts, and strategies to manage these issues.

**Credit Hours: 3**
**Prerequisites:** Enrollment restricted to College of Agriculture, Food and Natural Resources undergraduates and students minoring in Environmental Science.

**ENV_SC 2001: Topics in Environmental Science - General**
Organized study of selected topics. Subjects and credit may vary from semester to semester.

**Credit Hour: 1-99**

**ENV_SC 2600: Sustainability Foundations: An Introduction to Sustainability**
This course introduces fundamental concepts of sustainability from sustainable development to sustainability science. It focuses on human-environment systems, the characteristics of these systems, and patterns of change. Course materials interrogate taken-for-granted assumptions that shape human relationships with the natural world. You will learn to identify common dynamics leading to social and environmental problems with the aim of identifying alternative actions (solutions) for transitioning towards sustainability. Sustainability integrates the social and biophysical sciences; and implementing solutions requires the integration of the social justice, the arts, and humanities. Through a variety of interdisciplinary perspectives and frameworks, you will learn about current sustainability research and be able to develop an understanding of what sustainability means to you and your field of study. Graded on A-F basis only.

**Credit Hours: 3**
**Prerequisites:** sophomore standing

**ENV_SC 3085: Problems in Environmental Science**
Special individualized projects or readings in environmental science.

**Credit Hour: 1-99**

**ENV_SC 3250: Pollutant Fate and Transport**
(same as CV_ENG 3250). Introduction to concepts governing pollutant fate and transport in the environment, including pollutant interactions within and migration through environmental systems, as well as analytical techniques and tools necessary to quantify conditions and movement.

**Credit Hours: 3**
**Prerequisites:** ENV_SC 1100 or SOIL 2100 or CV_ENG 3200; and CHEM 1320

**ENV_SC 3290: Soils and the Environment**
(same as SOIL 3290). Addresses the role of soils and soil properties on environmental pollution and management. Emphasis will be placed on carbon, nitrogen, phosphorus, and sulfur transformations and transport in natural and disturbed ecosystems and soil management practices and technology to prevent or remediate environmental pollution.

**Credit Hours: 3**
**Prerequisites:** SOIL 2100, ENGLSH 1000. Recommended 3 hours of CHEM courses

**ENV_SC 3290W: Soils and the Environment - Writing Intensive**
(same as SOIL 3290W). Addresses the role of soils and soil properties on environmental pollution and management. Emphasis will be placed on carbon, nitrogen, phosphorus, and sulfur transformations and transport in natural and disturbed ecosystems and soil management practices and technology to prevent or remediate environmental pollution.

**Credit Hours: 3**
**Prerequisites:** SOIL 2100, ENGLSH 1000. Recommended 3 hours of CHEM courses

**ENV_SC 3330: Environmental Land Use Management**
An introduction to environmentally sustainable use and management of land.

**Credit Hours: 3**

**ENV_SC 3400: Water Quality and Natural Resources Management**
(same as NAT_R 3400). Introduction to broad aspects of water quality science, management, and policy. Topics include aquatic ecology, eutrophication, lake and coastal management, water supply and treatment, watershed management with respect to agriculture and urban development, and toxicology. Graded on A-F basis only.

**Credit Hours: 3**
**Recommended:** CHEM 1320 and ENV SC 1100 or NAT_R 1070

**ENV_SC 3500: Pollutant Fate and Transport**
This course introduces students to concepts governing pollutant fate and transport in the environment, and it provides students with the quantitative tools necessary to estimate the fate and transport of pollutants in the environment.

**Credit Hours: 3**
**Prerequisites:** ENV_SC 1100 or SOIL 2100, and CHEM 1320

**ENV_SC 4024: Foundations of Environmental Education**
(same as NAT_R 4024; cross-leveled with NAT_R 7024)This course provides a theoretical foundation to environmental education (EE). The purpose of this course is to develop the knowledge and skills for developing quality, age-appropriate EE for students in both formal and non-formal education setting. The emphasis is on EE curriculum materials, resources, and programs that can be used with students in settings at classrooms, nature centers, museums, and parks. This course involves training in the Missouri Department of Conservation Discover Nature School educational materials, and in observing and teaching EE lessons in a local nature center. Graded on A-F basis only.

**Credit Hours: 3**
**Prerequisites:** ENV_SC 1100 or SOIL 2100 or NAT_R 1060 or NAT_R 1070 or NAT_R 2160 or Instructor's consent
ENV_SC 4085: Problems in Environmental Science
Special individualized research projects or readings in environmental science.
Credit Hours: 1-99

ENV_SC 4100: Lake Ecology
(same as NAT_R 4100; cross-leveled with ENV_SC 7100, NAT_R 7100).
Ecology of inland waters with emphasis on productivity. Graded on A-F basis only.
Credit Hours: 3
Recommended: senior standing or BIO_SC 3650

ENV_SC 4300: Methods in Aquatic Ecology
(same as NAT_R 4300; cross-leveled with ENV_SC 7300, NAT_R 7300).
Methods used for quantitative assessment of water quality and quantity in inland waters. Graded on A-F basis only.
Credit Hours: 3
Recommended: senior standing or BIO_SC 3650 and ENV_SC 4100/ NAT_R 4100 or ENV_SC 3400/NAT_R 3400 or FOREST 4390

ENV_SC 4305: Environmental Soil Physics
(same as SOIL 4305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat.
Credit Hours: 3
Prerequisites: SOIL 2100
Recommended: PHYSCS 1210 or equivalent

ENV_SC 4306: Environmental Soil Physics Laboratory
(same as SOIL 4306). Introduction to the methodology and equipment for measurement of soil physical properties and processes.
Credit Hours: 2
Prerequisites or Corequisites: ENV_SC 4305

ENV_SC 4312: Environmental Soil Microbiology
(same as SOIL 4312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic transformation bioremediation, etc.
Credit Hours: 3
Prerequisites: SOIL 2100
Recommended: general microbiology

ENV_SC 4318: Environmental Soil Chemistry
(same as SOIL 4318 and GEOL 4318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes.
Credit Hours: 3
Prerequisites: SOIL 2100 or GEOl 2400, CHEM 1320 and CHEM 1330; junior standing or instructor's consent

ENV_SC 4320: Hydrologic and Water Quality Modeling
(same as NAT_R 4320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on watersheds to provide experience with the use of simulation models for natural resource decision making.
Credit Hours: 3
Prerequisites: ENV_SC 1100 or SOIL 2100

ENV_SC 4396: Agroforestry for Watershed Restoration
Agroforestry for watershed restoration will focus on integrated approaches for improved water quality, soil health, and economic benefits. Students will learn principles and practices, critical analysis and application of agroforestry practices to improve overall environmental quality. May be repeated for credit. Graded on A-F basis only.
Credit Hours: 3
Prerequisites: FOREST 4385 or FOREST 7385

ENV_SC 4940: Environmental Science Internship
Supervised professional experience with an approved public or private organization. Graded on S/U basis only.
Credit Hours: 1-99

ENV_SC 7100: Lake Ecology
(same as NAT_R 7100; cross-leveled with ENV_SC 4100, NAT_R 4100).
Ecology of inland waters with emphasis on productivity. Graded on A-F basis only.
Credit Hours: 3
Recommended: BIO_SC 3650

ENV_SC 7300: Methods in Aquatic Ecology
(same as NAT_R 7300; cross-leveled with ENV_SC 4300, NAT_R 4300).
Methods used for quantitative assessment of water quality and quantity in inland waters. Graded on A-F basis only.
Credit Hours: 3
Recommended: senior standing or BIO_SC 3650. ENV_SC 4100 or NAT_R 4100 or NAT_R 3400 or FOREST 4390

ENV_SC 7305: Environmental Soil Physics
(same as SOIL 7305). Study of soil physical properties and processes important in solving environmental problems. Topics include soil solids, water content and energy, and transport of water, solutes, gas and heat.
Credit Hours: 3
Prerequisites: SOIL 2100, PHYSCS 1210 or equivalent

ENV_SC 7306: Environmental Soil Physics Laboratory
(same as SOIL 7306). Introduction to the methodology and equipment for measurement of soil physical properties and processes. Prerequisites or Corequisites: SOIL 4305.
Credit Hours: 2

ENV_SC 7312: Environmental Soil Microbiology
(same as SOIL 7312). Microbiology/ecology of life in the soil ecosystem. Emphasis is placed on the role of microbes in nutrient cycling, microbial pesticide/xenobiotic degradation and bioremediation, soil quality and pathogen regulation in the environment. Nitrogen fixation, mycorrhizal processes are discussed.
Credit Hours: 3
ENV_SC 7318: Environmental Soil Chemistry
(same as SOIL 7318 and GEOL 7318). Study of chemical constituents and processes occurring in soils. Topics include soil minerals, and weathering processes, organic matter, solution chemistry, oxidation-reduction reactions and adsorption processes.

Credit Hours: 3
Prerequisites: SOIL 2100 or GEOL 2400, CHEM 1320 and CHEM 1330

ENV_SC 7320: Hydrologic and Water Quality Modeling
(same as NAT_R 7320). Introduction to models for simulating hydrologic and water quality processes. Emphasis is placed on watersheds to provide experience with the use of simulation models for natural resource decision making.

Credit Hours: 3
Prerequisites: ENV_SC 1100 or SOIL 2100 or equivalent

ENV_SC 7396: Agroforestry for Watershed Restoration
Agroforestry for watershed restoration will focus on integrated approaches for improved water quality, soil health, and economic benefits. Students will learn principles and practices, critical analysis and application of agroforestry practices to improve overall environmental quality. May be repeated for credit. Graded on A-F basis only.

Credit Hours: 3
Prerequisites: FOREST 4385 or FOREST 7385 or permission of instructor

ENV_SC 8090: Masters Research in Environmental Science
Original investigations in environmental science for presentation in a thesis. Graded on S/U basis only.

Credit Hour: 1-10

ENV_SC 8400: Solute Transport in the Vadose Zone
(same as SOIL 8400). Transport of water and solutes in geomedia with emphasis on development of the equations of flow. Evaluation of analytical and numeral solutions to equations describing transport phenomena.

Credit Hours: 3
Prerequisites: ENV_SC 7305 or SOIL 7305