

# ENVIRONMENTAL SCIENCE (ENVS)

---

## **ENVS 101 Introduction to Environmental Science (3 credits)**

General Education: Natural/Integrated Science  
Introduction to basic principles in the biological, physical, and social science areas of environmental science.

## **ENVS 102 Field Activities in Environmental Sciences (1 credit)**

General Education: Natural/Integrated Science  
Field studies for ENVS 101. Field demonstrations on waste management, water, air pollution, and the ecosystem. Field trips required. Prereqs or Coreqs: ENVS 101

## **ENVS 200 (s) Seminar (1-16 credits)**

Credit arranged

## **ENVS 201 Careers in the Environmental Sciences (3 credits)**

Introduction to the wide range of interdisciplinary professions and fields of study in the environmental sciences. Includes field trips. This course is designed for ENVS majors (both traditional and transfer students) and intended to be taken during the first year at U of I.

**Prereqs or Coreqs:** ENVS 101 and ENVS 102

## **ENVS 225 (s) International Environmental Issues Seminar (3 credits)**

General Education: International  
Cross-listed with IS 225  
Gen Ed: International Designed for individuals who have an interest in understanding environmental issues from a global perspective. The course focuses on various social and physical issues related to the environment and natural resources using human population dynamics as a backdrop. ENVS 101 recommended. (Spring only)

## **ENVS 299 (s) Directed Study (1-16 credits)**

Credit arranged

## **ENVS 300 (s) Environmental Sci Seminar (1-16 credits)**

Credits arranged. Junior-standing students study advanced topics in the environmental sciences using the coursework knowledge acquired in the previous two years of study. Includes numerous guest speakers, readings, and discussion, with specific preparation for the ENVS Senior Experience.

## **ENVS 386 Managing Complex Environmental Systems (3 credits)**

Cross-listed with NRS 386  
Complex environmental systems are comprised of interconnected social, economic, and environmental components. Explore complex environmental systems, frameworks and fundamental principles of sustainability in these systems by examining theory and practice in case studies. Topics may include natural resource scarcity and human conflict, ecosystem service provision, management, and conservation, and land tenure, rights, and justice relating to human access to natural resources.

## **ENVS 403 (s) Workshop (1-16 credits)**

Credit arranged

## **ENVS 404 (s) Special Topics (1-16 credits)**

Credit arranged

## **ENVS 405 (s) Professional Development (1-16 credits)**

Credit arranged

## **ENVS 408 Energy and Environment (3 credits)**

Joint-listed with ENVS 508

This course provides an exploration of the interplay between energy production, utilization, and their environmental impacts. The course delivers an introduction to fundamental mechanical, thermochemical, chemical, and biochemical principles essential for energy conversions from various resources. This course goes beyond technology discussion, offering an interdisciplinary approach encompassing an understanding of the far-reaching environmental implications arising from energy conversion and usage. Typically Offered: Fall.

## **ENVS 411 Data Wizardry in Environmental Sciences (3 credits)**

Joint-listed with ENVS 511

Data science skills are in demand across the full spectrum of careers in the environmental sciences. This course teaches programming and data science skills in the R programming language in the context of the interdisciplinary environmental sciences. Specific topics include planning for environmental data collection and analysis, basic introduction to environmental data analysis in R, environmental data exploration using graphs in R, environmental data exploration using basic statistical approaches in R, R programming, introduction to spatial data analysis in R, environmental data visualization via interactive web applications, and management of large environmental datasets in R. This course focuses on the development of practical skills and the application of skills through project-based learning. Additional work required for graduate credit. Typically Offered: Fall.

**Prereqs:** STAT 251

## **ENVS 415 Environmental Lifecycle Assessment (3 credits)**

Joint-listed with ENVS 515

Environmental life cycle assessment is the study of the environmental impacts resulting from the human production of goods and services from raw material acquisition through ultimate disposition. The class covers the basic concepts of life cycle assessment including definition of system boundaries, inventory of energy and material inputs and resultant emissions, assessment of impacts on human health and the environment, and interpretation of results. Recommended preparation: basic physical and biological sciences and familiarity with spreadsheet programs such as Excel. Additional assignment/projects required for graduate credit.

## **ENVS 420 Introduction to Bioregional Planning (3 credits)**

Joint-listed with ENVS 520, LAW 520

This class introduces students to bioregional planning concepts and shows the difference between "traditional" planning and bioregional planning and explores the relevance of "traditional" planning and bioregional planning for communities in the American West. Additional work required for graduate credit. Typically Offered: Fall.

## **ENVS 423 Planning Sustainable Places (3 credits)**

Cross-listed with BIOP 423

Joint-listed with ENVS 523, LAW 523

This course discusses the concept of sustainable development and its promises and pitfalls as a leading concept for the planning and design of communities. The course provides an overview of the different interpretations of sustainability and discusses the usefulness of these interpretations for planning in the context of the communities in which we live. Additional work required for graduate credit. Typically Offered: Varies.

## **ENVS 428 Pollution Prevention (3 credits)**

Basic concepts of pollution prevention and waste minimization; pollution prevention strategies and case studies for solid waste, hazardous waste, water and energy use, and air pollution. (Fall only)

**ENVS 429 Environmental Audit (3 credits)**

Details on a variety of equipment and processes used by business in order to decrease generation of solid and hazardous waste. (Fall only)

**ENVS 430 Planning Theory and Process (3 credits)**

Joint-listed with BIOP 530, ENVS 530

Seminar provides a historical and theoretical basis to address the application of knowledge to public and political decisions and the ethics of professional practice within public and non-governmental settings. Readings, discussions, and essays focus on underlying traditions and assumptions, cultural contexts, social justice and "planner" roles. Additional work required for graduate credit. Typically Offered: Varies.

**ENVS 436 Principles of Sustainability (3 credits)**

Cross-listed with FS 436

Joint-listed with ENVS 536 and FS 536

Presented as online doculectures, covering topics such as: Origins of Sustainability, Standards of Sustainability, Culture of Waste, Built Environment, Industrial Sustainability, Energy Sustainability, Water Resources, Measuring Sustainability, Sustainable Impact Assessment, and Our Sustainable Future. Readings and homework are assigned with each topic. Learning assessment will be from homework, exams and written papers. Additional work is required for graduate credit. Cooperative: open to WSU degree-seeking students. (Fall only)

**Prereqs:** Junior or higher standing

**ENVS 444 Water Quality in the Pacific Northwest (3 credits)**

Cross-listed with SOIL 444

Joint-listed with ENVS 544 and SOIL 544

Qualitative aspects of water are covered in this class. Major topics are qualitative aspects of (1) surface water, (2) groundwater, (3) drinking water, (4) water in the oceans, and (5) the human waste stream. Concepts presented are relevant to world-wide water quality issues and concepts; however, an emphasis is placed on issues within the four Pacific Northwest states (ID, AK, OR, WA).

**ENVS 448 Drinking Water and Human Health (3 credits)**

Cross-listed with SOIL 448

Joint-listed with ENVS 548 and SOIL 548

Understand the characterization, testing, and treatment of chemical, microbial and hazardous compounds and their impact on human health. Be familiar with drinking water standards, regulatory aspects and protection of municipal, community, and private well systems. (Spring, Alt/years)

**ENVS 450 Environmental Hydrology (3 credits)**

Cross-listed with SOIL 450

Comprehensive understanding of the hydrologic processes associated with the environmental processes. Includes components of the hydrologic cycle, analysis of precipitation and run off, evapotranspiration, routing, peak flow, infiltration, soil and water relationships, snowmelt, and frequency analysis. Typically Offered: Spring.

**Prereqs:** MATH 143 or vertically related higher course

**ENVS 475 Local and Regional Environmental Planning (3 credits)**

Cross-listed with NRS 475

This course focuses on environmental planning by governments, nonprofit organizations, and collaborative partnerships at the local and regional level. Students will study a variety of planning approaches, such as community visioning and policy and management tools. Topics will include planning for public health, natural areas, working landscapes, and the built environment. Typically Offered: Varies.

**Prereqs:** Junior or Senior standing or permission.

**ENVS 476 Environmental Project Management and Decision Making (4 credits)**

General Education: Senior Experience

Cross-listed with NRS 476

Integrated, interdisciplinary approaches to project and program management and decision making. Emphasis on environmental planning techniques, scenario development, analysis, and application of geospatial tools such as GIS and remote sensing. Direct experience and basic skills for project and program development and evaluation. Typically Offered: Spring (Even Years).

**Prereqs:** ENVS 420

**ENVS 477 Law, Ethics, and the Environment (3 credits)**

Cross-listed with AGEC 477, LAW 577

Joint-listed with ENVS 577

Examines the laws and related ethical questions pertaining to social and community-based natural resource and agroecosystem issues.

Recommended Preparation: BLAW 265. Typically Offered: Varies.

**Prereqs:** Junior standing and NRS 235 or FOR 235

**ENVS 479 Introduction to Environmental Regulations (3 credits)**

Joint-listed with ENVS 579

Interpretation and implementation of local, state, and federal environmental rules; introduction to environmental regulatory process; topics include regulatory aspects of environmental impact assessment, water pollution control, air pollution control, solid and hazardous waste, resource recovery and reuse, toxic substances, pesticides, occupational safety and health, radiation, facility siting, environmental auditing and liability. Additional projects/assignments required for graduate credit. (Fall only)

**ENVS 484 History of Energy (3 credits)**

Covers the history of humanity's relationship to energy. Takes a historical approach beginning with ancient sources of energy, the discovery and exploitation of coal and the industrial revolution, the critical importance of oil and its derivatives, natural gas, nuclear and renewables. Finishes with a look to possible future energy sources.

**ENVS 485 Energy Efficiency and Conservation (3 credits)**

Includes aspects of science, policy, and economics of energy use and efficiency measures. Considers use trends and existing and potential efficiencies primarily on a national scale with some consideration of both global and local situations. Focuses on residential and transportation energy with some coverage of commercial and industrial energy use.

**ENVS 497 (s) Senior Research (2-4 credits, max 4)**

General Education: Senior Experience

Open only to majors in environmental science. Preparation of proposal, poster, formal presentation and written thesis or report based on research or project conducted with a faculty member. Research addresses an environmental problem using laboratory, field, or library techniques.

**Prereqs:** Senior standing Prereqs or

**Coreqs:** ENGL 316 or ENGL 317

**ENVS 498 (s) Internship (1-16 credits)**

Credit arranged

**ENVS 499 (s) Directed Study (1-16 credits)**

Credit arranged

**ENVS 500 Master's Research and Thesis (1-16 credits)**

Credit arranged

**ENVS 501 (s) Seminar (1-16 credits)**

Credit arranged

**ENVS 502 (s) Directed Study (1-16 credits)**

Credit arranged

**ENVS 503 (s) Workshop (1-16 credits)**

Credit arranged

**ENVS 504 (s) Special Topics (1-16 credits)**

Credit arranged

**ENVS 505 (s) Professional Development (1-16 credits)**

Credit arranged

**ENVS 508 Energy and Environment (3 credits)**

Joint-listed with ENVS 408

This course provides an exploration of the interplay between energy production, utilization, and their environmental impacts. The course delivers an introduction to fundamental mechanical, thermochemical, chemical, and biochemical principles essential for energy conversions from various resources. This course goes beyond technology discussion, offering an interdisciplinary approach encompassing an understanding of the far-reaching environmental implications arising from energy conversion and usage. Typically Offered: Fall.

**ENVS 509 Principles of Environmental Toxicology (3 credits)**

Cross-listed with FS 509, SOIL 509

Joint-listed with SOIL 409

Fundamental toxicological concepts including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, and carcinogenesis; chemodynamics of environmental contaminants including transport, fate, and receptors; chemicals of environmental interest and how they are tested and regulated; risk assessment fundamentals. Graduate students are required to prepare an additional in-depth report. Recommended Preparation: BIOL 102 or BIOL 115, CHEM 111, CHEM 112, CHEM 275, and STAT 251. Typically Offered: Varies. Cooperative: open to WSU degree-seeking students.

**ENVS 511 Data Wizardry in Environmental Sciences (3 credits)**

Joint-listed with ENVS 411

Data science skills are in demand across the full spectrum of careers in the environmental sciences. This course teaches programming and data science skills in the R programming language in the context of the interdisciplinary environmental sciences. Specific topics include planning for environmental data collection and analysis, basic introduction to environmental data analysis in R, environmental data exploration using graphs in R, environmental data exploration using basic statistical approaches in R, R programming, introduction to spatial data analysis in R, environmental data visualization via interactive web applications, and management of large environmental datasets in R. This course focuses on the development of practical skills and the application of skills through project-based learning. Additional work required for graduate credit. Typically Offered: Fall.

**Prereqs:** STAT 251**ENVS 515 Environmental Lifecycle Assessment (3 credits)**

Joint-listed with ENVS 415

Environmental life cycle assessment is the study of the environmental impacts resulting from the human production of goods and services from raw material acquisition through ultimate disposition. The class covers the basic concepts of life cycle assessment including definition of system boundaries, inventory of energy and material inputs and resultant emissions, assessment of impacts on human health and the environment, and interpretation of results. Recommended preparation: basic physical and biological sciences and familiarity with spreadsheet programs such as Excel. Additional assignment/projects required for graduate credit.

**ENVS 520 Introduction to Bioregional Planning (3 credits)**

Cross-listed with BIOP 520

Joint-listed with ENVS 420

This class introduces students to bioregional planning concepts and shows the difference between "traditional" planning and bioregional planning and explores the relevance of "traditional" planning and bioregional planning for communities in the American West. Additional work required for graduate credit. Typically Offered: Varies.

**ENVS 523 Planning Sustainable Places (3 credits)**

Cross-listed with BIOP 523

Joint-listed with BIOP 423, ENVS 423

This course discusses the concept of sustainable development and its promises and pitfalls as a leading concept for the planning and design of communities. The course provides an overview of the different interpretations of sustainability and discusses the usefulness of these interpretations for planning in the context of the communities in which we live. Additional work required for graduate credit. Typically Offered: Varies.

**ENVS 530 Planning Theory and Process (3 credits)**

Cross-listed with BIOP 530

Joint-listed with ENVS 430

Seminar provides a historical and theoretical basis to address the application of knowledge to public and political decisions and the ethics of professional practice within public and non-governmental settings. Readings, discussions, and essays focus on underlying traditions and assumptions, cultural contexts, social justice and "planner" roles. Additional work required for graduate credit. Typically Offered: Varies.

**ENVS 536 Principles of Sustainability (3 credits)**

Cross-listed with FS 536

Joint-listed with FS 436

Presented as online doculectures, covering topics such as: Origins of Sustainability, Standards of Sustainability, Culture of Waste, Built Environment, Industrial Sustainability, Energy Sustainability, Water Resources, Measuring Sustainability, Sustainable Impact Assessment, and Our Sustainable Future. Readings and homework are assigned with each topic. Learning assessment will be from homework, exams and written papers. Additional work is required for graduate credit. Cooperative: open to WSU degree-seeking students. (Fall only)

**Prereqs:** Junior or higher standing.**ENVS 544 Water Quality in the Pacific Northwest (3 credits)**

Cross-listed with SOIL 544

Joint-listed with ENVS 444, SOIL 444

Qualitative aspects of water are covered in this class. Major topics are qualitative aspects of (1) surface water, (2) groundwater, (3) drinking water, (4) water in the oceans, and (5) the human waste stream. Concepts presented are relevant to world-wide water quality issues and concepts; however, an emphasis is placed on issues within the four Pacific Northwest states (ID, AK, OR, WA). Typically Offered: Fall.

**ENVS 548 Drinking Water and Human Health (3 credits)**

Cross-listed with SOIL 548

Joint-listed with ENVS 448 and SOIL 448

Understand the characterization, testing, and treatment of chemical, microbial and hazardous compounds and their impact on human health. Be familiar with drinking water standards, regulatory aspects and protection of municipal, community, and private well systems. (Spring, Alt/years)

**ENVS 551 Research Methods in the Environmental Social Sciences (3 credits)**

Qualitative and quantitative social science data collection and analysis methods in the specific context of environmental research topics. Methods include interviews, focus groups and surveys, qualitative coding and statistical analysis, research co-production, and using spatial data.

**Prereqs:** One course or experience in basic statistics or Instructor Permission

**ENVS 552 Environmental Philosophy (3 credits)**

Cross-listed with PHIL 552

Joint-listed with PHIL 452

Philosophical examination of various ethical, metaphysical, and legal issues concerning humans, nature, and the environment; issues covered may include biodiversity and species protection, animal rights, radical ecology, environmental racism, wilderness theory, population control, and property rights. Additional projects/assignments required for graduate credit.

**ENVS 577 Law, Ethics, and the Environment (3 credits)**

Joint-listed with AGECE 477, ENVS 477

, LAW 577. Examines the laws and related ethical questions pertaining to social and community-based natural resource and agroecosystem issues. Recommended Preparation: BLAW 265. Typically Offered: Varies.

**ENVS 579 Introduction to Environmental Regulations (3 credits)**

Joint-listed with ENVS 479

Interpretation and implementation of local, state, and federal environmental rules; introduction to environmental regulatory process; topics include regulatory aspects of environmental impact assessment, water pollution control, air pollution control, solid and hazardous waste, resource recovery and reuse, toxic substances, pesticides, occupational safety and health, radiation, facility siting, environmental auditing and liability. Additional projects/assignments required for graduate credit.

(Fall only)

**ENVS 598 (s) Internship (1-16 credits)**

Credit arranged

**ENVS 599 (s) Non-thesis Master's Research (1-16 credits)**

Credit arranged. Research not directly related to a thesis or dissertation.

**Prereqs:** Permission

**ENVS 600 Doctoral Research and Dissertation (1-45 credits)**

Credit arranged

**ENVS 604 (s) Special Topics (1-16 credits)**

Credit arranged

**Prereqs:** Enrollment in a Doctoral Program and Permission