

# ENVIRONMENT AND SUSTAINABILITY (ENVS)

The Environment and Sustainability Program focuses on the interactions of humans and the natural environment. Specifically, the Program studies the structure and function of natural systems, examines how social, political, and economic activity impacts those systems, and experiments with resilient solutions to unsustainable human impacts.

## Program Goals

- Applying the knowledge and methods of natural sciences to understand and analyze environmental problems and solutions.
- Implementing social science findings and frameworks to develop local, national, and global sustainable solutions.
- Using the insights of environmental history, literature, and ethics to inform current decision making.
- Developing interdisciplinary critical thinking, communication, and problem-solving skills to foster community and ecological resilience.
- Fostering leadership in sustainability, effective environmental citizenship, and career and advanced study opportunities in environmental fields.

In addition to the 42-credit Environment & Sustainability Standard Major, students have nine options for a comprehensive major, including four 3+2 pathways connected to Western's graduate programs. Students may also select the Coordinated Double Major with Business Administration.

- Environment and Sustainability Comprehensive Major: Climate Action Planning Emphasis (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-comprehensive-climate-action-planning/>)
- Environment and Sustainability Comprehensive Major: Food Systems Emphasis (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-comprehensive-food-systems/>)
- Environment and Sustainability Comprehensive Major: Individualized Contract Emphasis (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-comprehensive-individualized-contract/>)
- Environment and Sustainability Comprehensive Major: Public Land Management Emphasis (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-comprehensive-public-land-management/>)
- Environment and Sustainability Comprehensive Major: Water Emphasis (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-comprehensive-water/>)
- Environment and Sustainability Ecology Emphasis (with a 3+2 Master of Science in Ecology) (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/ecology-master-science-3-2/>)
- Environment and Sustainability Emphasis (with a 3+2 Outdoor Industry MBA) (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-3-2-oimba/>)
- Environment and Sustainability Major: Standard Program (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-standard-program/>)

- Environment and Sustainability Minor (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environment-sustainability-minor/>)
- Environment and Sustainability Nature Writing Emphasis (with a 3+2 MFA in Creative Writing) (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/nature-writing-mfa-crwr-3-2/>)
- Environmental Management Emphasis (with a 3+2 Master in Environmental Management) (<https://catalog.western.edu/undergraduate/programs/environment-sustainability/environmental-management-master-environmental-management/>)

## Capstone Course Requirement

The following course in the Environment and Sustainability Major fulfills the capstone course requirement: ENVS 400 Applied Sustainability.

## Environment and Sustainability Courses

### ENVS 100. Introduction to Environment and Sustainability (GT-SS2). (3 Credits)

An interdisciplinary, historical analysis of the development of environmental problems, movements, and philosophies. Students apply historical lessons to critically examine sustainable solutions locally and globally. GT-SS2

### ENVS 197. Special Topics. (1-6 Credits)

### ENVS 200. Writing the Environment. (3 Credits)

Students develop communication skills through presentations and writing on a variety of environmental issues appropriate to a wide variety of audiences. Through environmental essays, writing for nonprofit websites, grant proposals, and other forms of environmental writing, students are introduced to a broad range of skills needed for effective communication. Focus throughout the course on the analysis of arguments and texts further develops students' analytical and communication skills. Prerequisite: ENVS 100, or instructor permission; ENG 103 is recommended.

### ENVS 210. Introduction to Climate Policy. (3 Credits)

An introduction to policies and institutions that govern sectors most influential to climate change, including electricity, transportation, land use, and waste management. This class will offer a foundation to understand the actors and governing structures most relevant to climate action planning. Prerequisite: ENVS 100 or instructor permission.

### ENVS 250. Environmental Justice. (3 Credits)

This course introduces students to a perspective that understands injustice and inequality as fundamentally linked to environmental problems and outcomes. Students will study contested ideas about privilege, power, and marginalization, while examining their relationship to environmental problems. Prerequisite: ENVS 100 or SOC 101; or instructor permission.

### ENVS 260. Introduction to Public Lands Management. (4 Credits)

This course explores the field of public lands and resource management. A regional focus on the Western U.S. integrates with comparative examples from other regions. The course examines histories, current issues, and cultural trends in public lands agencies, as well as policies that govern land management. Prerequisite: ENVS 100 or instructor permission.

### ENVS 292. Independent Study. (1-3 Credits)

### ENVS 297. Special Topics. (1-6 Credits)

**ENVS 301. Science of Sustainability and Resilience. (3 Credits)**

A holistic inquiry into how humans might live the next chapter of our history, guided by the ecological principles of sustainability and resilience. Environmental problems and their possible solutions are analyzed critically and quantitatively; field experiences on campus and in the community involve students directly in the application of these principles. Themes include sustainable agriculture, green building, renewable energy, and conservation and restoration. Prerequisites: BIOL 130 and BIOL 135, or instructor permission.

**ENVS 315. Food Policy & Politics. (3 Credits)**

A review of the key actors and institutions in food and agricultural policy development at the local, state, and national level. The course covers the history of food policy and changes to the agricultural industry. Topics include the politics of nutrition, food as culture, and advocacy efforts to alleviate hunger and attain food justice. Prerequisite: ENVS 100 or instructor permission.

**ENVS 320. Quantitative Skills for Climate Action Planning. (3 Credits)**

A review of quantitative tools used to measure vulnerability, assess priorities, and evaluate implementation plans for climate action. Skills in data analytics, modeling, and projections will be developed. Prerequisites: MATH 113 or MATH 213, and ENVS 301; or instructor permission.

**ENVS 325. Introduction to Soil Science. (4 Credits)**

An introduction to soil formation, classification, morphology, chemistry, mineralogy, fertility, biology, and physical properties. Lectures and readings will be complemented by field trips and hands on activities as well as meetings with professionals. This course is suitable for undergraduate students interested in the importance of soils in agriculture, ecosystems, and engineering applications. Prerequisites: ESCI 105, or GEOL 101 and GEOL 105; CHEM 101; and either BIOL 130 and BIOL 135, or BIOL 151; or instructor permission.

**ENVS 350. U.S. and Western Environmental Politics. (3 Credits)**

An historical and contemporary investigation of U.S. environmental policies with an applied focus on the impact of national policy on the ecosystems and cultures of the American West. Reciprocally, this course traces how public lands agencies, social movements, historical land uses, and diverse cultures in the West shape U.S. environmental policy. Students combine analysis and discussion of major U.S. policies, prominent theories and issues, and student-led environmental service projects to better understand environmental challenges. Prerequisites: ENVS 100, ENVS 200 or ENG 103, ECON 370. Or instructor permission.

**ENVS 360. Global Environmental Policy. (3 Credits)**

A critical examination of key perspectives, economic and political processes, policy actors, and institutions involved in global environmental issues. Students analyze ecological, cultural, and social dimensions of international environmental concerns and governance as they have emerged in response to increased recognition of global environmental threats, globalization, and international contributions to understanding of these issues. The focus of the course encourages students to engage and evaluate texts within the broad policy discourse on globalization, justice, and the environment. Prerequisites: ENVS 100; ECON 201, ENVS 200 or SCI 202; junior standing or instructor approval.

**ENVS 370. Water Policy and Politics. (3 Credits)**

Study of the history, politics and institutions related to water policy and administration with comparative reference to different regions of the United States and internationally. Attention is given to the industrial development of the East and the created water resources of the arid West as a way to understand changing social sentiments toward water and water policy. The course also examines water pollution laws and water management. Prerequisites: ENVS 100; ECON 201 or ENVS 200 or SCI 202; junior standing or instructor approval.

**ENVS 373. The Water Planet. (3 Credits)**

An advanced water science course specifically designed for students interested in water related environmental science and policy. Topics include the physical and chemical properties of natural fresh waters and the movement and reservoirs of fresh water within the water cycle. The course includes several hands-on exercises and field experiences where students investigate and analyze natural waters in the Gunnison Basin. Prerequisites: GEOL 101; GEOL 105 and one of the following: CHEM 101 or CHEM 111. Or instructor permission.

**ENVS 375. Seminar in Water Topics. (3 Credits)**

An occasional offering that may include water topics in politics and policy, ethics and philosophy, or science. Prerequisite: ENVS 200 and ENVS 301, or instructor permission.

**ENVS 376. The Colorado Water Workshop. (1 Credit)**

A three-day annual conference bringing students together with a variety of water users, managers, ranchers, environmentalists, regulators and others involved in water issues for presentations and discussion on matters ranging from specific municipal or water district projects to major basin-wide planning for the great rivers of the West to global issues of water use and protection. Topics vary from year to year. Prerequisite: ENVS 350 and ENVS 370, or instructor permission.

**ENVS 380. Advanced Climate Policy. (3 Credits)**

An advanced examination of climate change governance, which may include a focus on any one of the sectors most influential in shaping climate change including electricity, transportation, land use, and/or waste management. Designed as a work-shop style deep dive into a particular policy, or policies, this class prepares students to engage in policy analysis and advocacy. Prerequisite: ENVS 210; or instructor permission.

**ENVS 385. Sustainable Agriculture & Food Production. (4 Credits)**

An introduction to the skills, tools, and tactics required for sustainable food production, including raising vegetables and managing livestock. This applied course involves hands-on experience with crop and livestock planning, operation design, soil health management, pest control, and distribution strategies. Prerequisite: ENVS 100. Prerequisite or Co-requisite: ENVS 325. Or instructor permission.

**ENVS 390. Environmental Monitoring. (4 Credits)**

A field-work based study of local (Gunnison Basin) environmental problems. Numerous monitoring techniques are implemented based on principles of biology, chemistry, and geology. The emphasis is on collaborative and integrative group projects dealing directly with real-world environmental problems. Prerequisites: ENVS 301 and one of the following: ECON 216, MATH 113, MATH 213, or SOC 211. Or instructor permission.

**ENVS 392. Independent Study. (1-6 Credits)****ENVS 397. Special Topics. (1-6 Credits)****ENVS 399. Environment and Sustainability Internship. (1-6 Credits)**

**ENVS 400. Applied Sustainability. (3 Credits)**

A field-based, collaborative, problem-solving experience that addresses a current issue in environmental sustainability. Implementing frameworks such as resilient and systems thinking, students collect information, analyze results, write a report, publicly present their findings, and begin to implement solutions informed by their analysis. Students learn basic skills for transforming their ENVS education into compelling environmental professional career possibilities. Prerequisites: ENVS 350 and ENVS 390; or instructor permission.

**ENVS 410. Environmental Ethics. (3 Credits)**

A seminar on the complexities of environmental issues from a philosophical perspective. The course also offers a survey of the evolution of environmental moral philosophy as well as in-depth analysis of major thinkers in the field. Students confront ethical concerns from both historical and personal perspectives, with an emphasis on the ability to critically evaluate and apply these perspectives to their work in environmental fields. Prerequisite: ENVS 301 and 350; or PHIL 335; or instructor permission.

**ENVS 420. Natural History of the Gunnison Basin. (3 Credits)**

An overview of place-based natural history, current ecological research, and current environmental issues facing the region. Prerequisites: ENVS 100 and instructor permission.

**ENVS 430. Watersheds of the World. (3 Credits)**

This field course is designed to provide students with an introduction to important science and policy issues in selected watersheds throughout the world. Students receive an overview of place-based natural history, current ecological research, and current environmental issues and policy facing the region. Examples include the local and global effects of resource extraction, tourism, air and water pollution, land use changes, and global climate change. This is an expedition course (approximately 3 weeks) and is experiential in nature. Prerequisites: ENVS 100 and instructor permission.

**ENVS 435. Environmental Grant Writing. (1 Credit)**

Effective grant writing is critical to the success of many environmental organizations. In this course, students learn about the grant writing process and develop grant writing skills through an applied workshop. Topics include finding funding opportunities, understanding foundational elements of grant proposals, creating budgets, receiving feedback and revising. Prerequisite: ENVS 200; or instructor permission.

**ENVS 492. Independent Study. (1-6 Credits)****ENVS 497. Special Topics. (1-6 Credits)****ENVS 499. Internship in Environmental Studies. (1-6 Credits)**

An opportunity to apply skills and knowledge from course work to an employment setting. Prerequisite: approval from an Environmental Studies advisor and the Program Director.

**ENVS 510. Spec Topcs: Environ & Sustain. (1-6 Credits)****ENVS 601. Introduction to Environmental Management. (5 Credits)**

A study of bioregional and multidisciplinary approaches to environmental management, with emphasis on community and systemic responses to rapid global environmental change. Students develop fluency in historical and contemporary responses to environmental issues and, by exploring the learning laboratories of the Gunnison Valley, study key environmental stakeholders, models of resiliency, and tools for effecting change on a range of temporal and geographic scales.

**ENVS 605. Science for Environmental Management. (3 Credits)**

A survey of contemporary environmental science focusing on the integration of ecological and social research for natural resource management and conservation. Students gain familiarity with methodologies for developing scientific knowledge, accessing scientific information, doing inclusive science, applying science to plan for and achieve management outcomes, and communicating science to a wide range of audiences. Class projects introduce students to a range of issues and provide students with opportunity to contribute to real-world initiatives bridging these spheres.

**ENVS 606. Ecosystem Restoration. (3 Credits)**

Introduction to ecosystem types, threats to ecosystems, restoration principles and practices, and conservation mechanisms on multiple scales that may help curb additional ecosystem loss and degradation. Students will become familiar with best practices for restoring and conserving ecosystems through local, regional, and international case studies and participate in hands-on learning opportunities.

**ENVS 608. Environmental Politics & Policy. (3 Credits)**

Analysis of the key interactions between environmental policy and management, focusing on environmental decision-making within an array of policy contexts. Emphasis is on important federal policies such as the Clean Water Act and National Environmental Policy Act, with attention to the institutions, actors, and ideas driving environmental policy in the US and abroad.

**ENVS 609. Technical Skills in Ecosystem Restoration. (1-3 Credits)**

A workshop-style format course that gives students the opportunity to develop technical field skills in ecosystem restoration. No prerequisites. The course will include, but will not be limited to, key skills necessary for students to be workforce ready: Wetland delineation. Watershed and ecosystem health assessment and developing monitoring protocols. Soil health assessment and soil moisture monitoring. Water quality sampling and interpretation. Process-based restoration techniques and project design (planning, impact assessment, permitting, implementation). GIS and drone mapping for restoration planning and monitoring. Fluvial Geomorphology. Applied Aquatic Ecology.

**ENVS 611. Integrative Skills for Environmental Management. (3 Credits)**

The course focuses on developing skills needed to manage environmental projects and for career in environmental management. Students develop a thorough understanding of skills such as project management, collaborative conservation, grant-writing, inclusivity, adaptive management, systems thinking, and environmental communication through working as groups on client projects.

**ENVS 612. Introduction to Analysis and Assessment for Environmental Management. (3 Credits)**

An overview of a range of quantitative and qualitative analytic methods essential to environmental management careers in Integrative Land Management, Sustainable and Resilient Communities, and Global Sustainability. Topics covered include descriptive and inferential statistics, research methods and design, qualitative data collection and analysis, graphic presentation of results, and evidence-based decision-making. This course empowers students to organize, analyze, and graphically present environmental data.

**ENVS 615. From Climate Science to Action. (3 Credits)**

An action-oriented course about the science of climate change, with an emphasis on climate justice, and mitigation and adaptation strategies for careers in environmental management. Topics include greenhouse gas emissions, climate forces and feedbacks, climate ethics and justice, effects on ecological and human systems, and action strategies for climate change mitigation and adaptation at the local, regional, and planetary scale.

**ENVS 616. Environmental Organization Development and Management. (3 Credits)**

An introduction to developing organizations at the nexus of economic, social, and natural systems, and to the key skills necessary to succeed in this complex and highly competitive environment. Course discusses competitively advantageous strategies and practices organizations adopt to grow revenues, cut costs, improve market share, enhance brands, and redesign products and processes toward positive environmental and social impacts. Course examples will include sustainable innovation, creativity, and entrepreneurship from around the world. Students learn to identify the best opportunities, generate innovative non-profit and for-profit business models, frame and reframe problems, produce creative solutions, and generate a culture of innovation, creativity, and entrepreneurship within an organization utilizing principles from a variety of thinking methods including systems, design, and group thinking. Prerequisites: ENVS 605; ENVS 608; ENVS 611

**ENVS 617. Global Sustainability. (3 Credits)**

An exploration of how international governments, NGOs, and other entities join to move the world toward a more sustainable future. Addresses contemporary topics such as industrial ecology, international natural resource management, sustainable development, and other relevant areas of study. Students develop skills in accessing, assessing, and applying social, economic and environmental data and practices to global issues. Prerequisites: ENVS 605; ENVS 608; and ENVS 611.

**ENVS 618. Public Lands Management. (3 Credits)**

An exploration of the current and traditional approaches to public land and resource management. A regional focus on the Western U.S. is integrated with comparative examples from other regions and countries to enhance and broaden student perspectives. Course examines the history and future management implications of public lands agencies and policies, such as the National Parks, National Forests, Bureau of Land Management, NEPA and multi-use mandates. Special focus will be given to the management skills necessary in leading public lands agencies on the regional level. Prerequisites: ENVS 605; ENVS 608; ENVS 611.

**ENVS 620. Studies in Sustainable and Resilient Communities. (3 Credits)**

An examination of selected topics covering the content understanding, analytical skills, and management approaches vital to cultivating sustainable and resilient communities. Topics include subjects such as Climate Change Mitigation and Adaptation, Sustainable Food Systems, Sustainable Energy Futures, Sustainable Economic Development, Movements in Community Resilience, and Frameworks in Sustainability. This course is repeatable, since students are required to take this course three times, as long as the topic changes. Prerequisites: ENVS 616 or ENVS 617.

**ENVS 623. Studies in Environmental Management. (1-6 Credits)**

An examination of selected topics covering the content understanding, analytical skills, and management approaches vital to environmental management. Topics will vary from semester to semester based on faculty interest and student need. This course is repeatable, as long as the topic changes. Prerequisites: ENVS 616 or ENVS 617 or ENVS 618.

**ENVS 625. Studies in Integrative and Public Land Management. (3 Credits)**

An examination of selected topics covering the content understanding, analytical skills, and management approaches vital to cultivating sustainable and resilient communities. Topics include subjects such as Climate Change Mitigation and Adaptation, Sustainable Food Systems, Sustainable Energy Futures, Sustainable Economic Development, Movements in Community Resilience, and Frameworks in Sustainability. This course is repeatable, since students are required to take this course three times, as long as the topic changes. Prerequisites: ENVS 617 or ENVS 618.

**ENVS 690. MEM Project Development. (5 Credits)**

An introduction to the Master's Project. Course examines environmental project design strategies, successful environmental solutions, and organizations/community stakeholder groups seeking environmental management assistance from MEM students in the Master's Project. Students design, plan, and coordinate second year Master's Project with faculty mentors and community stakeholders. Requires two-weeks residency in Gunnison during culmination of course. Prerequisites: MEM Core

**ENVS 692. Independent Study in Environment Management. (1-6 Credits)**

**ENVS 694. Master's Project and Portfolio. (3-6 Credits)**  
Students design and apply a specific research and environmental management project to an active environmental organization, green business, land agency, or community stakeholder group. Requires students to develop a lens and goal for environmental management; identify a project that enables the student to manifest his/her environmental management goal; research global best practices for similar projects; complete the project over 10 months; write up, present, and defend the results for the faculty mentor and MEM community; and complete an environmental career portfolio. Course spans Fall (3 credits) and Spring (6 credits) of the second year, and requires 9 total hours. This is a repeatable course for variable credit. Prerequisites: ENVS 690.