ENVIRONMENTAL SCIENCE (ENVS)

ENVS 101 Introduction to Environmental Science-GTSC23 Credits
Impact of resource use and pollution on the earth’s environment and biota. Scientific approach to solving environmental problems and the impacts of values upon global environmental decisions examined. General environmental awareness and literacy emphasized. Students may take either ENVS 101 or ENVS 103/ENVS 103L for essential learning natural science credit, but not both.

Essential Learning Categories: Natural Sciences
Colorado Guaranteed Transfer (GT) Pathways General Education Curriculum

ENVS 103 Field-Based Introduction to Environmental Science-GTSC13 Credits
Examination of the effects of resource use and pollution on the earth’s environment and biota. Integration of lecture with field and lab exercises to demonstrate scientific approach to solving environmental problems. Emphasis on environmental awareness and critical thinking. Students may take either ENVS 101 or ENVS 103/ENVS 103L for essential learning natural science credit, but not both.

Corequisites: ENVS 103.
Essential Learning Categories: Natural Science with lab - Both the lab and lecture must be completed
Colorado Guaranteed Transfer (GT) Pathways General Education Curriculum

ENVS 103L Field-Based Introduction to Environmental Science Laboratory-GTSC11 Credit
Lab component required for ENVS 103.
Corequisites: ENVS 103.
Essential Learning Categories: Natural Science with lab - Both the lab and lecture must be completed
Colorado Guaranteed Transfer (GT) Pathways General Education Curriculum

ENVS 104 Environmental Science: Global Sustainability3 Credits
Examination of local to global environmental issues. Includes human population dynamics and impact of agriculture on the environment, ecosystem function, energy use and sustainable development, air, water and soil pollution, climate change and environmental policy. Critical evaluation of readings from historical and modern environmental topics supplement lectures.

Prerequisites: Declared ENVS major or minor or permission of instructor. Will not count as credit to the major if credit has already been received for ENVS 101 or ENVS 103.

ENVS 105 Readings in Environmental Science1 Credit
Critical readings in environmental science. Majors in Environmental Science and Technology only. ENVS 101 and 105 together are a substitute for ENVS 104.

Prerequisites: ENVS 101.

ENVS 150 Introduction to Environmental Field Studies1-3 Credits
Techniques for common field measurements in environmental science. Basic interpretation and statistical analysis of data. Human effects on natural systems.

ENVS 196 Topics1-3 Credits
Course may be taken multiple times up to maximum of 15 credit hours.

ENVS 204 Introduction to Ecosystem Management3 Credits
Scientific management of natural resources in a changing environment. Problem solving emphasized in a case study approach to ecosystem management. Theories of ecology, economics, fisheries and wildlife management, biology, and sociology to solve problems using realistic and complex landscape scenarios.

Prerequisites: ENVS 104 or permission of instructor.
Corequisites: ENVS 204L.

ENVS 204L Introduction to Ecosystem Management Laboratory1 Credit
Lab component required for ENVS 204.

Prerequisites: ENVS 104 or permission of instructor.
Corequisites: ENVS 204.

Fees: Yes.

ENVS 212 Environmental Health and Safety2 Credits
Examination of environmental health and safety issues associated with hazardous materials. Includes basic toxicology, threat assessment, and control strategies. Meets 40-hour OSHA training requirement for hazardous waste operations.

Prerequisites: ENVS 221.

ENVS 221 Science and Technology of Pollution Control3 Credits
Introduction to scientific, engineering, and technical elements of pollution control. Includes pollutant characteristics, investigation and cleanup of contaminated sites, waste treatment (air emissions, wastewater discharges, hazardous waste), waste minimization, life cycle analysis, and industrial ecology. Lab focuses on site investigation skills, design and operation of selected treatment technologies, and waste minimization audits.

Prerequisites: ENVS 104; mastery of high school algebra; CHEM 121 or CHEM 131 recommended.
Corequisites: ENVS 221L.

ENVS 221L Science and Technology of Pollution Control Laboratory1 Credit
Lab component for ENVS 221.

Prerequisites: ENVS 101 or ENVS 104; mastery of high school algebra; CHEM 121 or CHEM 131 recommended.
Corequisites: ENVS 221.

Fees: Yes.

ENVS 296 Topics1-3 Credits
Course may be taken multiple times up to maximum of 15 credit hours.

ENVS 301 Environmental Project Management2 Credits
Basic practices of effective project management, including proposal preparation, planning, scheduling, cost estimating, cost and progress tracking, and team building.

Prerequisites: Any one of the following: ENVS 204, ENVS 221, ENVS 331, ENVS 340.

ENVS 312 Soil Science and Sustainability3 Credits

Prerequisites: CHEM 121 or higher and ENVS 204/ENVS 204L, or permission of instructor.
Corequisites: ENVS 312L.

ENVS 312L Soil Science and Sustainability Laboratory1 Credit
Lab component required for ENVS 312.

Prerequisites: CHEM 121 or higher and ENVS 204/ENVS 204L, or permission of instructor.
Corequisites: ENVS 312.

Fees: Yes.
ENVS 315 Mined Land Rehabilitation 2 Credits
Principles and practices of mined land reclamation. Topics include mining techniques, disturbances caused by mining, regulations, closure of mine features, soil preparation, revegetation, and monitoring.
Prerequisites: ENVS 455 or ENVS 312/ENVS 312L (may be taken concurrently).
Fees: Yes.

ENVS 321 Environmental Risk Analysis 3 Credits
Assessment, management, and control of risk from toxic substances in the environment. Topics include basic elements of toxicity testing and epidemiology, chemical fate in the environment, exposure assessment, uncertainty in risk estimates, approaches to risk management, and risk communication.
Prerequisites: ENVS 221/ENVS 221L, and MATH 113.

ENVS 331 Water Quality 3 Credits
Physical, chemical, and biological properties of aquatic systems. Includes movement of water in the watershed, stream classification and stability, lake circulation, aquatic ecology, chemistry and biology of natural and polluted waters, water quality monitoring, regulation and protection of surface water, and watershed assessment and management. Lab focuses on practical skills and field measurements culminating in an assessment of a local watershed.
Prerequisites: CHEM 121 or CHEM 132, and STAT 200.
Corequisites: ENVS 331L.

ENVS 331L Water Quality Laboratory 1 Credit
Lab component required for ENVS 331.
Prerequisites: CHEM 121 or CHEM 132, and STAT 200.
Corequisites: ENVS 331.
Fees: Yes.

ENVS 337 Stream Biomonitoring 2 Credits
Examination of the structure and organization of macroinvertebrate assemblages in streams and rivers. Topics include sample collection, sample preservation, sample identification, and analysis using the State of Colorado multimetric index for assessing water quality.
Prerequisites: ENVS 331/ENVS 331L.

ENVS 340 Applied Atmospheric Science 3 Credits
Examination of the atmosphere and air pollution. Includes physical and chemical properties of the atmosphere, meteorology, air pollutant sources and effects, monitoring, pollutant dispersion, emission inventory, management of emissions, and regulation of air quality.
Prerequisites: CHEM 121 or CHEM 131.

ENVS 350 Ecology and Management of Shrublands and Grasslands 3 Credits
Examination of ecological principles in determining the structure, function, and management of North American grasslands and shrublands. Three one-hour lectures and one three-hour lab per week. Two Saturday labs may be required.
Prerequisites: STAT 200 and ENVS 204/ENVS 204L.
Corequisites: ENVS 350L.

ENVS 350L Ecology and Management of Shrublands and Grasslands Laboratory 1 Credit
Lab component required for ENVS 350.
Prerequisites: STAT 200 and ENVS 204/ENVS 204L.
Corequisites: ENVS 350.
Fees: Yes.

ENVS 354 Forest Ecology and Management 3 Credits
Examination of the structure and function of trees and forests. Topics include forest stand development, carbon cycling, nutrient cycling, forest disturbances, and basic practices of sustainable forest management.
Prerequisites: ENVS 204/ENVS 204L.

ENVS 360 Fire Ecology 3 Credits
Examination of the ecological effects of fire on forests, shrublands, and grasslands. Includes fire effects on plants, animals, soil, and water, as well as using fire as a restoration tool.
Prerequisites: STAT 200 and ENVS 204/ENVS 204L.
Corequisites: ENVS 360L.

ENVS 360L Fire Ecology Laboratory 1 Credit
Field experience examining the ecological effects of fire on forests, shrublands, and grasslands of the Colorado Plateau. Includes field and lab studies that test the effects of fire on plants, animals, soil, and water. One 3-hour lab per week. May require 2 Saturday labs.
Prerequisites: STAT 200 and ENVS 204/ENVS 204L.
Corequisites: ENVS 360.
Fees: Yes.

ENVS 370 Renewable Energy 3 Credits
Introduction to renewable energy resources from a technical perspective with an emphasis on sustainability. Includes concepts of energy and power, units of measure, sources and forms of energy, uses of energy, energy efficiency, electricity, solar thermal and photovoltaics, bioenergy, hydropower, tidal power, wave power, wind power, geothermal, hydrogen, efficient building design, and integration of renewables with current energy supplies.
Prerequisites: MATH 113 or higher.
Equivalent Course(s): GEOL 370
Terms Typically Offered: Fall.

ENVS 373 Climate Change Adaptation 3 Credits
Climate change vulnerability and adaptation strategies in natural resource management. Includes the scientific basis of climate change and assessing the exposure, sensitivity, and adaptive capacity of species and ecosystems to climate change.
Prerequisites: ENVS 204.
Terms Typically Offered: Spring.

ENVS 374 Sustainable Building 3 Credits
Principles and practices of “green” building. Topics include philosophy of sustainable design, site development, passive heating and cooling, innovative structural systems and materials, energy supply and conservation, water and waste water management, indoor air quality, and case studies.

ENVS 376 Ecological Design and Technology 3 Credits
Examination of ecosystem-based technology to benefit both humans and the environment. Topics covered include the philosophy of ecological design and technology, relevant ecological principles, and ecological technologies including treatment wetlands, anaerobic digesters, algal flow ways, ecological treatment systems, rain gardens, green walls, and green roofs.
Prerequisites: CHEM 121/CHEM 121L, ENVS 204, and MATH 113.
Terms Typically Offered: Fall.
ENVS 377 Systems Thinking in Environmental Science 3 Credits
Exploration of systems thinking as an approach to environmental issues. Topics covered include the meaning of systems and systems thinking, examining systems using the “triple P” framework (people, planet, profit), drawing system diagrams, conducting life cycle assessment and eMergy analysis to quantify environmental impacts, and modeling systems.
Prerequisites: ENVS 204 and MATH 113.
Terms Typically Offered: Spring.

ENVS 378 Permaculture Design 3 Credits
Practical application of ecology to design of sustainable human and agricultural systems. Topics include permaculture principles, design strategies, sustainable agriculture, natural building, cooperative economics, and neighborhood design. Students work in teams to complete a design project for a local site.
Corequisites: ENVS 378L.
Terms Typically Offered: Fall, Summer.

ENVS 378L Permaculture Design Laboratory 1 Credit
Practical application of ecology to design of sustainable human and agricultural systems. Topics include permaculture principles, design strategies, sustainable agriculture, natural building, cooperative economics, and neighborhood design. Students work in teams to complete a design project for a local site.
Corequisites: ENVS 378.
Terms Typically Offered: Fall, Summer.

ENVS 394 Natural Resources of the West 1 Credit
Seminars covering topics related to natural resources including water, soil, land, mineral and energy resources in the western United States. Guest speakers are invited from the academic community, industry or government agencies to give formal oral presentations following by informal discussion with students and faculty.
Equivalent Course(s): GEOL 394
Course may be taken multiple times up to maximum of 4 credit hours.

ENVS 395 Independent Study 1-3 Credits
Course may be taken multiple times up to maximum of 6 credit hours.

ENVS 396 Topics 1-3 Credits
Course may be taken multiple times up to maximum of 15 credit hours.
Fees: Yes.

ENVS 396L Topics 1-3 Credits
Course may be taken multiple times up to maximum of 15 credit hours.

ENVS 410 Environmental Regulatory Compliance 3 Credits
Examination of regulatory requirements pertaining to air pollution, water pollution, hazardous materials, and radioactive materials. Additional topics include enforcement, compliance management systems, compliance auditing, and innovative approaches to regulation.
Prerequisites: ENVS 221, and junior or senior standing.

ENVS 413 Environmental Fate and Transport of Contaminants 3 Credits
Physical, chemical, and biological factors influencing the persistence and migration of chemicals in the environment. Includes consideration of air, surface water, soil, and ground water. Emphasis on quantitative problem solving.
Prerequisites: CHEM 121 or CHEM 132; and MATH 119, MATH 146, or MATH 151.

ENVS 420 Pollution Investigation & Monitoring 3 Credits
Survey of field sampling and analytical methods for study of environmental systems. Topics include sampling design, regulatory issues, quality assurance, quality control, data interpretation, and reporting. Three one-hour lectures and one three-hour laboratory per week.
Prerequisites: CHEM 121 or CHEM 131, and STAT 200; ENVS 221/ENVS 221L recommended.
Corequisites: ENVS 420L.

ENVS 420L Pollution Investigation & Monitoring Laboratory 1 Credit
Examination of strategies and techniques for investigating contaminated sites and monitoring environmental pollutants. Topics include Phase I assessments, development and implementation of sampling and monitoring plans, quality assurance, methods of analysis, and data interpretation and presentation.
Prerequisites: CHEM 121 or CHEM 131, and STAT 200; ENVS 221/ENVS 221L recommended.
Corequisites: ENVS 420.

ENVS 431 Water and Wastewater Treatment 3 Credits
Examination of water and wastewater treatment processes including physical, chemical, and biological treatment technologies. Emphasis on unit process design and modeling.
Prerequisites: ENVS 331.

ENVS 433 Restoration of Aquatic Systems 3 Credits
Principles and practices of restoring the functions and values of streams, ponds, and wetlands. Addresses physical, chemical, and biological aspects of these aquatic systems.
Prerequisites: ENVS 331/ENVS 331L.

ENVS 435 Restoration Ecology 3 Credits
Examination of principles and techniques for restoration of community characteristics and ecosystem functions to disturbed lands. Lecture and lab emphasize practical application of ecological principles to restoration culminating in an independent project of designing a restoration project for a local area.
Prerequisites: ENVS 204 and ENVS 312, or permission of instructor.
Corequisites: ENVS 455L.

ENVS 455 Restoration Ecology Laboratory 1 Credit
Lab component required for ENVS 455.
Prerequisites: ENVS 204 and ENVS 312, or permission of instructor.
Corequisites: ENVS 455.
Fees: Yes.

ENVS 460 Fire Management 3 Credits
Examination of principles and current topics in fire management, including fire behavior, prescribed fire/smoke management, fuels/fuels management, wildfire control, fire in the wildland-urban interface, and fire policy.
Prerequisites: ENVS 360/ENVS 360L, STAT 200, one semester of biology.
Corequisites: ENVS 460L.

ENVS 460L Fire Management Laboratory 1 Credit
Field, lab, and computer modeling experience in predicting fire behavior, planning prescribed burns, managing hazardous fuels, and assessing wildfire risk in the wildland-urban interface.
Prerequisites: ENVS 360/ENVS 360L, STAT 200, one semester of biology.
Corequisites: ENVS 460.
Fees: Yes.
ENVS 475 Experimental Design and Statistical Analysis in Environmental Science
3 Credits
Examination of principles and techniques for designing experiments and analyzing data in environmental sciences. Emphasis on practical application of analysis techniques using environmental data with computer applications.
Prerequisites: ENVS 204 or ENVS 221, STAT 200, and 6 upper division credits; or permission of instructor.

ENVS 492 Capstone in Environmental Science and Technology
2 Credits
Small-group environmental projects for outside organizations. Prepare project proposals, plan and implement projects, write project reports, and give oral presentations to clients. Exit exams for the Environmental Science and Technology major are administered as part of this course.
Prerequisites: Senior standing or permission of instructor.

ENVS 495 Independent Study
1-3 Credits
Course may be taken multiple times up to maximum of 6 credit hours.

ENVS 496 Topics
1-3 Credits
Course may be taken multiple times up to maximum of 15 credit hours.

ENVS 497 Structured Research
1-3 Credits
Research in environmental science under the direct guidance of a faculty member. Designed for junior and senior level students.
Prerequisites: Permission of instructor.
Course may be taken multiple times up to maximum of 6 credit hours.

ENVS 499 Internship
1-4 Credits
Work experience for a non-academic organization on environmental projects. Requires 45 contact hours per credit hour, a final report, and oral presentation. Available as an elective for Environmental Science & Technology majors.
Prerequisites: Junior or senior standing in the Environmental Science & Technology program or permission of instructor.
Course may be taken multiple times up to maximum of 15 credit hours.

ENVS 596 Topics
1-3 Credits
Course may be taken multiple times up to maximum of 15 credit hours.