

Environmental Studies (ENVI)

College of Indigenous Studies

Community Based Science (<https://www.uaf.edu/rural/academics/departments/>)

[907-474-2748](tel:907-474-2748)

ENVI F101X Introduction to Environmental Science

4 Credits

Offered Once Per Academic Year

Interdisciplinary course provides a foundation in concepts of environmental sciences. Earth's systems and scientific principles used to understand environmental questions. Topics covered include ecological processes, ecosystems, biodiversity, evolution, human population growth, sustainability, resource management, energy challenges, climate change, the human impact on the environment and environmental policy. For non-science majors.

Recommended: One high school or college-level science course.

Attributes: UAF Degree Natural Sci w/ Lab, UAF GER Natural Science Req

Lecture + Lab + Other: 3 + 3 + 0

Grading System: Letter Grades with option of Plus/Minus

ENVI F102X Introduction to Climate Change Science

4 Credits

Offered Fall

An introductory course intended primarily for non-science majors that explores interdisciplinary aspects of climate change and how it affects our lives, including Earth's climate history, scientific methods, Indigenous perspectives, causes, feedbacks and effects of climate change on biodiversity and communities in Alaska and globally, alternative energies and climate policies.

Recommended: One high school or college-level course in biology, geography, chemistry or other basic sciences.

Attributes: UAF GER Natural Science Req

Lecture + Lab + Other: 3 + 3 + 0

Grading System: Letter Grades with option of Plus/Minus

ENVI F110 Introduction to Water Quality I: Measurement

1 Credit

Offered As Demand Warrants

Introduces students to standard water quality methods used and applies them to rural Alaska. Students will become familiar with EPA water quality standards and programs that help preserve water quality in rural communities. Key topics covered include: stream ecology, wastewater management, storm water runoff and data analysis.

Lecture + Lab + Other: 0.5 + 0 + 1.5

Grading System: Letter Grades with option of Plus/Minus

ENVI F111 Introduction to Water Quality II: Monitoring and Assessment

1 Credit

Offered As Demand Warrants

Course builds upon methods in ENVI F110 with emphasis placed upon data quality objectives, electronic storage of data, and information analysis and reporting. Methods and equipment used for surface water monitoring will be introduced. Students will begin developing EPA approved Quality Assurance Project Plan for surface water quality monitoring.

Prerequisites: ENVI F110.

Lecture + Lab + Other: 1 + 0 + 0

Grading System: Letter Grades with option of Plus/Minus

ENVI F112 Introduction to Water Quality III: Data Quality Assurance

1 Credit

Offered As Demand Warrants

Students will review proper use of surface water (SW) quality testing equipment, calibration and operation methods learned in ENVI F110 and F111. Class emphasis is placed on conducting data quality assurance measures; meeting data objectives contributing to writing Quality Assurance Project Plans for continuing their US EPA SW monitoring plan.

Prerequisites: ENVI F111.

Lecture + Lab + Other: 1 + 0 + 0

Grading System: Letter Grades with option of Plus/Minus

ENVI F115 Rural Solid and Hazardous Waste Management

1 Credit

Offered As Demand Warrants

An overview of solid and hazardous waste management focusing on rural Alaskan communities. Topics covered include: workplace safety, worker roles, recycling facility operation, solid waste composting, hazardous material and waste inventorying, toxicology principles, risk assessment, hazardous site community open dumpsite assessment and the implications of the National Environmental Policy Act.

Lecture + Lab + Other: 1 + 0 + 0

Grading System: Pass/Fail Grades

ENVI F116 Rural Alaska Landfill Operator

1 Credit

Offered As Demand Warrants

Best practices in managing rural landfills in compliance with State of Alaska regulations with an emphasis on operator and public safety. Course is designed to train operators for rural Alaska Class II and Class III landfills; passing grade results in recognition by the Solid Waste Association of North America-Alaska.

Lecture + Lab + Other: 1 + 0 + 0

Grading System: Pass/Fail Grades

ENVI F117 Community Spill Response

1 Credit

Offered As Demand Warrants

Overview of petroleum and other community health-threatening spill responses with emphasis placed upon the issues, techniques and basic elements of Alaskan community spill response. Topics include: above/underground storage tanks, spill contamination site treatment, state/federal governmental regulations related to spills, spill reporting/incident action plans, and practical procedures in spill response.

Lecture + Lab + Other: 1 + 0 + 0

Grading System: Pass/Fail Grades

ENVI F120 Home Energy Basics

1 Credit

Offered Fall and Spring

Basics of space heating and electricity use and production for Alaskan homes. Main topics include fundamentals of physics related to home energy, lighting and appliances, energy bills, building science, retrofits, home renewable energy systems. Course emphasizes how to decrease fossil fuel consumption of homes.

Lecture + Lab + Other: 1 + 0 + 0

Grading System: Pass/Fail Grades

ENVI F121 Building Ventilation and Energy

1 Credit

Offered As Demand Warrants

Basics of indoor air quality and its relationship to ventilation and energy use in buildings. Main topics include indoor air pollutant types; moisture, condensation and mold-related basic science; and heat recovery ventilation. Emphasis: practical ways of how homeowners can maintain healthy indoor air while keeping their energy bill low.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades**ENVI F122 Energy Efficient Building Design and Simulation**

1 Credit

Offered As Demand Warrants

In this course, students gain basic practical knowledge related to the process of designing energy efficient buildings, as applied to both new construction and retrofits. Main topics covered include basic building science, principles and techniques of energy efficient construction, and building energy simulations.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades**ENVI F130 Introduction to the National Environmental Policy Act**

1 Credit

Offered As Demand Warrants

Course will explain what community members need to do to be heard in the NEPA process with special emphasis on public involvement and Environmental Impact Analysis (EIA). Course covers the roles and the content of scoping and Environmental Assessments in relation to key natural resource development projects in rural Alaska.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Letter Grades with option of Plus/Minus**ENVI F150 Viewpoints in Environmental Studies**

1 Credit

Offered As Demand Warrants

Discussions and activities will focus on how scientists or research technicians evaluate environmental issues. The course is intended for first year college students and community members. Specific topics may include sustainability, resource development, ecosystem management, indigenous viewpoints, building technology, appropriate energy applications, and analysis of data.

Special Notes: Topics announced prior to each offering; course may be repeated for credit towards a certificate or degree program to a maximum of 3 credits.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades**Repeatable for Credit:** May be taken 3 times for up to 3 credits**ENVI F160 Internship in Environmental Studies**

1-2 Credits

Offered As Demand Warrants

Under the guidance of a UAF Bristol Bay Campus-approved agency or business (public or private that monitors, tests, analyzes or studies the environment), students gain supervised pre-professional experience in environmental studies. The intern will explore the interdisciplinary aspects of field or laboratory research, build practical expertise and make contacts.

Prerequisites: ENVI F101X.

Special Notes: Internships make one to ten weeks of full-time commitment to the agency or business and when completed make public presentations on the experience.

Lecture + Lab + Other: 0 + 0 + 3.1-15.4**Grading System:** Pass/Fail Grades**Repeatable for Credit:** May be taken 2 times for up to 4 credits**ENVI F170 Solar Energy Basics**

1 Credit

Offered Fall and Spring

Presents basics of utilization, design and installation of solar electric and hot water energy systems. Emphasis on residential-scale systems; principles apply to larger applications also. Introduces basic physics related to solar energy, harvesting solar energy, system components, design considerations, energy storage, installation and cost/benefit considerations, career opportunities, and safety.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades**ENVI F173 Basics of Small Wind Systems**

1 Credit

Offered Fall and Spring

Presents basics of design, installation, and operation of wind energy systems with an emphasis on residential-scale systems. Introduces physics related to wind energy, methods to harvest wind energy, turbine and site selection, energy storage vs. grid-tie considerations, system components, installation techniques, cost/benefit considerations, and safety.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades**ENVI F174 Basics of Heat Pump Systems**

1 Credit

Offered Fall and Spring

Presents basics of heat pump (geoexchange) systems and their use for space heating/cooling and domestic hot water production. Includes both ground-source and air-source heat pumps. Introduces physical concepts related to harvesting energy at Earth's surface, system components, common installation configurations, cost/benefit considerations, and safety.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades**ENVI F175 Introduction to Biomass Energy Systems**

1 Credit

Offered Spring

Biomass is a rapidly growing portion of the sustainable energy sector. Innovation meets historic and contemporary organic fuel types such as wood, agricultural, waste and algae. Various technologies and fuel types are covered that contribute to practical biomass energy today, with a focus on wood thermal energy in Alaska.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades**ENVI F180 Alaska Utility Lecture Series**

1 Credit

Offered As Demand Warrants

Lecture series introduces students to operations, management and employment in Alaska's rural and urban electric utilities. Lecturers will share their expertise and various perspectives related to utility management (small and large utility, agency, project development and integration, training/education, utility customers, etc.). Discussion and reflection/synthesis will be encouraged.

Lecture + Lab + Other: 1 + 0 + 0**Grading System:** Pass/Fail Grades

ENVI F220 Introduction to Sustainable Energy

3 Credits

Offered Fall and Spring

Introduction to societal problems and solutions related to its energy use and production. Problems discussed are mainly related to the extent of sustainability of current energy practices. Solutions discussed cover both energy efficiency and renewable energy.

Prerequisites: MATH F105 or CTT F106 or TTCH F131.

Recommended: ENVI F101X; ENVI F120.

Lecture + Lab + Other: 3 + 0 + 0

Grading System: Letter Grades with option of Plus/Minus

ENVI F250 Current Topics in Environmental Studies

1-3 Credits

Offered As Demand Warrants

Using multiple scientific viewpoints, a specific environmental issue is explored through case studies and in-depth discussions with an emphasis on complex connections between ecosystems and society. Themes include sustainability, resource development, indigenous viewpoints, resource management, building technology and energy applications.

Prerequisites: ENVI F101X; WRTG F111X; F100-level science class.

Special Notes: Topics announced prior to each offering and course may be repeated for credit towards a certificate or degree program to a maximum of 3 credits.

Lecture + Lab + Other: 3 + 0 + 0

Grading System: Letter Grades with option of Plus/Minus

Repeatable for Credit: May be taken 3 times for up to 6 credits

ENVI F255 Climate Change and Alaska

3 Credits

Offered Fall and Spring

This introductory climate science course focuses on climate change causes and subsequent influences on nature and society. Concepts will focus on broad geographical and ecological systems that drive how and why climate changes. The course also investigates many of the contemporary environmental issues Alaskans must face in a warming world.

Lecture + Lab + Other: 3 + 0 + 0

Grading System: Letter Grades with option of Plus/Minus

ENVI F260 Field Techniques for Environmental Technicians

2 Credits

Offered Summer

Provides hands-on instruction in interdisciplinary field and laboratory techniques used by environmental technicians. Basic methods for sampling and studying terrestrial or aquatic ecosystems will be introduced. Students will participate in data collection and analysis procedures as part of an independent research project.

Prerequisites: ENVI F101X or NRM F101; ENVI F110; 4-credit lab-based F100-level science course.

Recommended: CIOS F100; CIOS F135.

Lecture + Lab + Other: 1 + 3 + 0

Grading System: Letter Grades with option of Plus/Minus

ENVI F265 Introduction to Methods in Environmental Studies Reporting

2 Credits

Offered As Demand Warrants

Introduces basic data collection methods and research skills necessary to analyze, interpret, and document, field and laboratory data, including technical reporting processes in environmental studies. Course is designed to integrate raw environmental data into a technical report covering ecosystem functions, energy, biodiversity, that can be presented in scientific meeting format.

Prerequisites: ENVI F101X or NRM F101; ENVI F110; ENVI F260; lab-based F100-level science course.

Recommended: WRTG F111X; ENVI F160.

Lecture + Lab + Other: 1.5 + 0 + 1.5

Grading System: Letter Grades with option of Plus/Minus

ENVI F271 Solar Electric Design and Installation

2 Credits

Offered Fall, Spring and Summer

Solar Electric Design and Installation is a gateway to the solar industry.

The course material includes electricity and solar PV fundamentals, system components, site analysis, system sizing, performance estimation, overcurrent protection and grounding. The course focuses on grid-direct PV systems but covers material critical to understanding all types of PV.

Lecture + Lab + Other: 2 + 0 + 0

Grading System: Letter Grades with option of Plus/Minus

Repeatable for Credit: May be taken 3 times for up to 6 credits