

ENVIRONMENTAL CONSERVATION (ENVC)

Also see **Geographic Information Systems and Science**

Program Description

The Environmental Conservation (ENVC) program is designed to meet the growing need for environmental and natural resource technicians within the natural resources and parkland areas. The effects from landscape uses such as forestry, agriculture, and urban development are the main focus of the Aquatic/Terrestrial emphasis. Students choosing the Marine emphasis will focus on jobs in the marine environment. Graduates may be employed by federal, state, county, and city governments, tribal nations or private businesses managing natural resources. Employment by non-governmental organizations is also on the rise. The Parks Resources Management emphasis is designed to meet the needs of students seeking employment with federal, state, county, city, or private recreational agencies. Students may need to conduct a job search beyond the local community in order to find the positions they desire. In addition, graduates may use their ATA degrees as a transfer degree to the College of Forest Resources, University of Washington; Evergreen State University; Fairhaven College (WWU); or the Department of Natural Resources, University of Idaho. Students who plan to transfer should first work with the Department Chair to develop a two-year schedule of appropriate classes.

Career Opportunities

The six-quarter Environmental Conservation program includes: (1) the study of aquatic/terrestrial ecology from pristine lakes and forest lands to highly utilized riverine systems in unmanaged and managed landscapes including a mosaic of agriculture, forests, urban areas; (2) the study of marine environments such as estuaries and coastal areas; and (3) the study of fish and wildlife ecology and management issues. Biological and ecological analysis in the field as well as in the laboratory, geographic information systems (GIS), technical writing skills and the acquisition of related occupational skills will be developed. In addition, environmental interpretation and facilities maintenance courses are offered for the Parks Resources Management emphasis. Career development courses are

available in forestry techniques, salmon ecology, conservation biology, and geographic information systems (GIS).

Students interested in a career path in a wastewater and drinking water treatment emphasis should take ENVC 212 and 249 as electives as well as CHEM& 121 and 131. Please see the Department Chair for details.

Entry into the Program

Please apply to the Admissions Office. Students are generally admitted Fall or Winter quarters. It is highly recommended that students have completed their pre-college coursework before entry. However, students with relevant work experience or equivalent coursework may be admitted at other times with the Department Chair's permission. Advanced standing may be requested. For further information, contact the Department Chair or the Admissions Office.

Work-Based Learning

Students will integrate their classroom learning with work-based learning experience by participating in Cooperative Education (ENVC 199) at a supervised work site in an approved job in an environmental business, state, federal or county administration or non-governmental organization working with environmental issues. Students who desire a degree and are already employed in the field may develop cooperative work positions with their current employer. A total of six credits within the six quarters are required. Department Chair approval is required. Credits and grades are based on job hours worked, work performance and completion of learning objectives. Concurrent enrollment in Cooperative Education Seminar required. ENVC 199 may substitute for up to five credits of technical coursework with the permission of the Department Chair.

Associate in Technical Arts Degree

An Associate in Technical Arts degree (ATA) is awarded upon completion of a minimum of 90 credits of specified technical and related education coursework above 100 level with both an overall 2.0 grade point average and a 2.0 grade point average in the technical major.

SUGGESTED SCHEDULES

ATA ENVIRONMENTAL CONSERVATION- AQUATIC/TERRESTRIAL EMPHASIS

Includes required ATA courses. Student schedule may vary based on entry point, credit load, and prerequisites. Consult with department chair or SVC counselor for scheduling options.

FIRST YEAR

Fall	Cr	Winter	Cr	Spring	Cr
ENVC 101	5	ENVC 112	5	ENVC 122	5
ENVC 102	4	ENVC 123	5	ENVC 140	5
ENVC 104	1	†ENGL& 101	5	ENGL& 230	3
BIOL 107	5	PE 200	2	OR ENGL 104	5
.....		.....		†MATH& 146	5
Total	15	Total	17	Total	18+
Summer....Cr					
‡ENVC 199	6				
TOTAL.....	6				

SECOND YEAR

Fall	Cr	Winter	Cr	Spring	Cr
ENVC 201	5	ENVC 210	5	ENVC 220	4
ENVC 202	5	ENVC 211	4	ENVC 221	3
GIS 101	5	ENVC Elec....	3-5	ENVC 222	3
SOSC 113	1	*LC/GE	5-10	CMST& 210	5
SOSC 125	2	.....		OR CMST& 220	
.....		.....		GIS 105	2
.....		.....		GIS 106	2
Total	18	Total	17+	Total	19

ATA ENVIRONMENTAL CONSERVATION-MARINE EMPHASIS

Includes required ATA courses. Student schedule may vary based on entry point, credit load, and prerequisites. Consult with department chair or SVC counselor for scheduling options.

FIRST YEAR

Fall	Cr	Winter	Cr	Spring	Cr
ENVC 101	5	ENVC 112	5	ENVC 122	5
ENVC 104	1	ENVC 123	5	ENVC/BIOC Elec....	3-5
BIOL 107	5	†MATH& 146	5	BIOL 190	3
GIS 101	5	PE 200 or 205	1	†ENGL& 101	5
**MT 108	3	.....		OCEA& 101	5
Total	19	Total	16	Total	21+
SUMMER...Cr					
‡ENVC 199	6				
Total	6				

SECOND YEAR

Fall	Cr	Winter	Cr	Spring	Cr
ENVC 202	5	ENVC 210	5	ENVC 220	4
BIOL& 211	5	ENVC 211	4	ENVC 222	3
*LC/GE	5-10	BIOL& 212	5	BIOL& 213	5
SOSC 113	1	CMST& 210	5	ENGL& 230	3
ENVC Elec....	3-5	OR CMST& 220		GIS 105	2
.....		.....		SOSC 125	2
Total	19+	Total	19	Total	19

ATA ENVIRONMENTAL CONSERVATION-PARKS RESOURCE MANAGEMENT EMPHASIS

Includes required ATA courses. Student schedule may vary based on entry point, credit load, and prerequisites. Consult with department chair or SVC counselor for scheduling options.

FIRST YEAR

Fall.....Cr	Winter.....Cr	Spring.....Cr
ENVC 101 .....5	ENVC 112 .....5	ENVC 133.....5
ENVC 102 .....4	ENVC 123.....5	ENVC 140 .....5
ENVC 104.....1	ENVC 130.....5	GIS 105.....2
BIOL 107.....5	†ENGL 170.....3	GIS 106.....2
ENVC Elec.....3-5		†MATH 100.....5
		OR †MATH& 146
Total 18+	Total 18	Total 19
Summer....Cr		
‡ENVC 199.....6		
Total 6		

SECOND YEAR

Fall.....Cr	Winter.....Cr	Spring.....Cr
ENVC 201 .....5	^CJ 228 .....30	ENVC 122.....5
ENVC 202.....5	OR	ENVC 221 3
GIS 101.....5	@Electives	ENVC 231 .....5
PE 200.....2	(12 min as	OR ENVC 232
SOSC 113.....1	approved by	CMST& 210 .....5
	dept. chair)	OR CMST& 220
	*LC/GE.....5-10	SOSC 125.....2
Total 18	Total 17+	Total .....20

* Learning Community (5-10 credits) or 5 credits of General Education (culture, natural world or arts). Must be outside of technical area, approved by Department Chair. Please see INDEX regarding Learning Communities.

† Students who do not receive an appropriate test score will require additional coursework to develop necessary skills for entry into class.

‡ ENVC 199 may be taken at any time during the two-year program with Department Chair approval.

@ Electives must be chosen from within the sciences, GIS or computer technology.

** A certificate in boat piloting from the U.S. Coast Guard may substitute for this class.

^ Satisfies General Education requirements (LC/GE) and PE 200.

TRANSFER AGREEMENT WITH UNIVERSITY OF WASHINGTON & UNIVERSITY OF IDAHO

College of Forest Resources at the University of Washington and College of Natural Resources at the University of Idaho have approved the transfer of students who complete the following sequence of courses:

FIRST YEAR

Fall.....Cr	Winter.....Cr	Spring.....Cr
ENVC 101 .....5	ENVC 112 .....5	ENVC 122.....5
BIOL 107.....5	ENVC 123.....5	ENVC 140 or.....
BIOL& 211 .....5	†MATH& 146..5	BIOL 133.....5
PE 200.....2	CHEM& 121.....5	†ENGL& 101 .....5
SOSC 125.....2		CHEM& 131.....5
Total 19	Total .....20	Total .....20
Summer....Cr		
‡ENVC 199 .....6		
MATH 111 .....5		
*LC/GE .....5-10		
Total 16+		

TRANSFER AGREEMENT (continued)

SECOND YEAR

Fall.....Cr	Winter.....Cr	Spring.....Cr
ENVC 201 .....5	ENVC 210.....5	ENVC 220 .....4
ENVC 202.....4	ENVC 211 .....4	ENVC 221 .....3
ENVC Elec.....3-5	BIOL& 212.....5	ENVC 222 .....3
†MATH& 142...5	CMST& 220.....5	†ENGL& 230...3
SOSC 113.....1	MATH& 151.....5	OR ENGL 104..5
		MATH& 152.....5
Total 18+	Total .....24	Total 18+

* Learning Community (5-10 credits) or 5 credits of General Education (culture, natural world or arts). Must be outside of technical area, approved by Department Chair. Please see INDEX regarding Learning Communities.

† Students who do not receive an appropriate test score will require additional coursework to develop necessary skills for entry into class.

‡ ENVC 199 may be taken at any time during the two-year program with Department Chair approval.

Program Certificates

INDIVIDUAL TECHNICAL CERTIFICATE

An Individual Technical Certificate may be developed in conjunction with other programs to meet marketable objectives and goals with Department Chair approval. Professional upgrade certification available in Wildlife, Restoration, Water Quality and Fisheries. Clusters of 3-6 courses are the basis for an upgrade certificate.

Micro-Certificates

These certificates focus on a specific skill within this program. The delineation certificates provide skills needed to assist/conduct wetland delineation. A certificate is awarded to students who complete the following with a 2.0 grade point average or above:

BASIC WETLAND DELINEATION CERTIFICATE

ENVC 140 and 220.

ADVANCED WETLAND DELINEATION CERTIFICATE

ENVC 101, 140, 201, and 220

GEOGRAPHIC INFORMATION SYSTEMS

GIS 101, 102, 105, 106, and 202 or 203. (GIS courses must be taken in this sequence.)

For more information and course descriptions, please see Geographic Information Systems (GIS).

Course Descriptions

ENVC 101 Introduction to Watershed Management (5)

Basic geologic processes related to aquatic systems such as rivers, lakes, and wetlands. Measuring and calculating watershed management parameters encouraging quantitative thinking. Includes basic orienteering skills. Lab and field trips required.

ENVC 102 Invertebrate Biology and Identification (4)

Natural history, biology, and taxonomy of common invertebrates including their natural history and biogeographic distribution.

ENVC 104 Introduction to Natural Resources (1)

Introduction to natural resource agencies and institutions, including career opportunities; i.e. the role of the technician in forestry, fisheries, agriculture and parks.

ENVC 112 Limnology (5)

Introduction to natural and human-induced processes that shape lake ecosystems. Quantitative and qualitative measuring techniques will be used, including bioassessment techniques of biological integrity. Lab and field trips required. Prerequisite: ENVC 101 and BIOL 107 or Department Chair approval.

ENVC 122 Stream Ecology (5)

Introduction to physical, chemical and biological components of lotic systems and their anthropogenic impacts. Sampling techniques, lab procedures, water quality and stream habitat will be evaluated. Perform bioassessment. Exploration of global and cultural issues in relation to rivers. Proof of current tetanus vaccination (10 years) is required. Prerequisite: ENVC 112 or Department Chair approval.

ENVC 123 Fish Biology, Taxonomy, and Life History (5)

Classification, biology, and physiology of representative North American fish.

ENVC 130 Environmental Interpretation (5)

Research presentation and communication styles through oral, visual, and audio-visual means of the history, geology, or natural history of an area, concept or species. Interpretation and discussion of ancient cultural archeological sites and influences on the present.

ENVC 133 Facilities Maintenance Fundamentals (5)

Introduction to facilities maintenance including basic grounds maintenance, electrical, plumbing, and carpentry fundamentals.

ENVC 140 Plants of Western Washington (5)

Collection, identification, and plant community grouping of local and regional gymnosperms and angiosperms. Identify invasive species.

ENVC 199 Cooperative Education (1-15)

Supervised work experience in the field. Includes a weekly seminar. Instructor permission required.

ENVC 201 Watershed Restoration (5)

Techniques and ecological context for restoration and its application in the conservation of biodiversity. Covers state and federal laws pertaining to ecological field work and potential funding sources. Evaluation of social and economic impact of restoration to diverse groups of people. Includes methods in biological engineering. Field trips required. Prerequisite: ENVC 122 with a minimum C grade or Department Chair approval.

ENVC 202 Wildlife Biology (5)

Concepts in wildlife management and conservation biology including cultural values and issues. Relationship between land use patterns and responses by wildlife populations. Reading in technical journals and report writing required.

ENVC 210 Fish Ecology and Management (5)

Fish communities and their ecological requirements. Emphasis on population dynamics in relation to habitat changes. Reading and researching technical journals on current topics of fish conservation and management required. Report writing required. Prerequisite: ENVC 122 and 123.

ENVC 211 Ecological Sampling and Monitoring Design (4)

General sampling concepts and population estimation. Methods in ecological sampling of mammals, birds, amphibians, vascular reptiles, fish, and plants. TFW program procedures for ambient monitoring. Introduction to ecological software. Field trips required. Strongly recommended: Familiarity with computers and spreadsheets. Prerequisite: MATH& 146.

ENVC 212 Water & Wastewater Treating Laboratory (2)

Focuses on the use of approved methods for collection, testing and reporting of results of samples taken to obtain data for submission to State and Federal regulatory agencies. Use of appropriate methods for collection, testing and reporting of results of effluent samples used to control operation of Water and Wastewater Treating plants. Prerequisite: ENVC 101 and MATH 100.

ENVC 220 Wetlands in Managed Landscapes (4)

General overview of wetland soils, hydrology, and ecology including wetland delineation. Application of basic landscape ecology theory and human impacts on wetlands. Field trips required. Prerequisite: ENVC 101 and 122 or Department Chair approval.

ENVC 221 Ecology of Ecosystem Edges/Ecotones (3)

Importance of ecotones between freshwater systems and upland areas. Essential biological processes shaping ecological properties of ecotones at various scales of time and space. Students must conduct research and give a short seminar. Prerequisite: ENVC 101 and 202 or Department Chair approval.

ENVC 222 Field Project (3)

Field project in cooperation with a landowner starting with a proposal and ending with a written report based on data collected by the student. Includes research in technical journals, time estimates, and monitoring of project costs. Prerequisite: ENVC 202 and 210 or Department Chair approval.

ENVC 225 Current Issues in Ecology (2)

A current topic of ecology will be examined through guest speakers combined with literature research and seminar presentations. For current & past topics, go to the SVC internet, <http://www.skagit.edu/>; click on Educational Programs.

ENVC 231 Introduction to Mammology (5)

Natural history, structure, identification, and classification of North American mammals.

ENVC 232 Bird Identification (5)

Natural history, biology, taxonomy, and identification of Pacific Northwest species.

ENVC 243 Field Techniques for Natural Resource Techs (3)

Forest resource management practices including reforestation, silviculture, forest inventory, harvest systems, and road location and construction in Northwest forests. Influence of forest management practices on watershed processes. Field trips required.

ENVC 244 Salmon Ecology (3)

Ecology of the Pacific Northwest salmon and their importance to social and economic values.

ENVC 245 Conservation Biology (5)

Introduction to conservation biology. Ecological software will be used to explore the planet's biodiversity, conduct data collection, parameter estimation, and population viability analysis. Prerequisite: BIOL 101 or BIOL& 211 or Department Chair approval.

ENVC 249 Introduction to Fluid Flow (5)

Introduction to fundamentals of Newtonian and non-Newtonian fluids in open and closed systems. Calculation of system pressure profiles for liquids and gases in water treatment facilities. Introduction to measurement and control of flowing fluids. Scientific handheld calculator with graphing capability required. Prerequisite: ENVC 101 and MATH 100.