

# Environmental Studies and Geography

The Environmental Studies and Geography Department offers a wide variety of courses focusing mainly on the academic area of Environmental Studies. The intention is to provide students with the systematic elements essential for an understanding of environmental impacts, policy, history and thought. It is possible for students to develop their interests in three areas: the physical processes underlying environmental systems; the human impacts on these systems, including policy creation; or the history and philosophy of environmental issues, especially ethical perspectives. In order for a complete understanding of the impacts people are having on their environment, whether they be at a local, regional or global scale, we must understand the how and why the environment is changing. Global warming, acid precipitation, ozone depletion, waste management and water conservation are issues which require thorough examination in order that proper decision-making processes can be implemented by leaders in government, industry and non-governmental organizations. We carefully and systematically examine all aspects of the environment so that our graduates can play an important role in the future of our environment.

A degree in Environmental Studies and Geography often leads to degrees in higher education, including an M.A. and/or Ph.D. It is also a sound basis for a career in law and/or politics, teaching, journalism, environmental consulting or government service. Former graduates have been very successful in attaining admission to Graduate and Law Schools, and obtaining employment in various occupational fields related to the environment.

Bishop's location in the midst of an area of great economic, cultural and physical diversity provides many opportunities for students to take part in practical fieldwork and applied projects. Such studies are integral parts of several courses, especially those relating to elements of physical geography and human impact on the environment. Students enrolling in ESG courses should be prepared to devote time to fieldwork outside of normal class time. Details of field studies will be discussed within individual courses.

The Eastern Townships Collection of the Bishop's University Library provides an important source of research materials for local area studies dealing in particular with the geography of southern Quebec.

## The Program

### Areas of Concentration

Students must register in either the Environmental Studies Concentration or the Geography Concentration. The details of the concentrations are given below:

#### A) Environmental Studies Concentration

48-credit Major

#### 1. Core Required Courses 11 courses 33 credits

Students must take all of the following courses, preferably in the annual sequence noted:

##### Year 1:

ESG 100 Introduction to Environmental Studies

ESG 126 Introduction to Human Geography

ESG 127 Introduction to Physical Geography

MAT 190 Precalculus Mathematics

ELA 116 Effective Writing or

a University-level English Literature 3-credit course

**Year 2:**

ESG 260 Research Methods  
ESG 262 Introduction to Geographic Information Systems  
ESG 224 Human Impact on the Environment  
ESG 267 Global Environmental Change: a physical perspective

One of the following quantitative analysis courses:

ESG 261, BMA 140, EMA 140, PMA 160 or PHY 101

**Year 3:**

ESG 300 Environmental Studies Seminar

**2. Additional Required Courses 5 courses 15 credits**

Students must complete 5 courses from one of the three following lists (laboratory credits do not count toward the total credits required):

**a) Environmental Impact and Policy:**

ESG 175 Economic Geography  
ESG 212 Urban Geography  
ESG 227 Oceans II  
ESG 249 Resource Management  
ESG 264 Outdoor Recreation  
ESG 266 Environmental Policy  
ESG 339 The Canadian Arctic  
ESG 340 The Circumpolar North  
ESG 348 Urban Planning  
ESG 349 Watershed Management  
ESG 350 Environmental Justice  
ESG 354 Environmental Impact Assessment  
ESG 358 International Environmental Issues  
ESG 362 Advanced Geographic Information Systems  
ECO 103 Macroeconomics  
ECO 102 Microeconomics  
ECO 237 Economics of the Environment  
POL 101 Introduction to Modern Governments  
POL 214 Public Administration  
POL 334 Public Policy Analysis  
PBI 241 Evolutionary Psychology  
PSY 293 Multicultural Psychology  
SOC 322 Urban Sociology  
SOC 381 Media and the Environment

**b) Science and the Environment**

ESG 226 Oceans I  
ESG 227 Oceans II  
ESG 250 Geomorphology  
ESG 251 Soils and Vegetation  
ESG 265 The Atmosphere and Weather  
ESG 269 Earth's Crust  
ESG 361 Glacial Environments  
ESG 362 Advanced Geographic Information Systems  
ESG 363 Natural Hazards  
ESG 364 Field Course in Geography

ESG 365 Mid-latitude Weather Systems  
ESG 367 Climate Change  
BIO 115 General Zoology  
BIO 116 General Botany  
BIO 117 General Ecology  
BIO 191 Introductory Biology  
BIO 217 Advanced Ecology  
BIO 221 Biogeography  
MAT 191 Enriched Calculus I  
PHY 191 Introductory Physics I  
CHE 191 General Chemistry I  
CHE 133 Environmental Chemistry

### **c) Environmental History and Thought:**

ESG 162 Canada: A Nation of Regions  
ESG 163 Introduction to Landscape and Cultural Geography  
ESG 211 Historical Geography of the Eastern Townships  
ESG 268 Human Landscape and Environmental Change  
ESG 339 The Canadian Arctic  
ESG 340 The Circumpolar North  
ESG 353 Landscape  
ESG 366 Ethical Perspectives on Environmental Problems  
ENG 118 Literature of the Environment  
HIS 104 The Development of the West  
HIS 105 The 20th Century World  
HIS 211 Canada Since 1945  
PHI 140 Introduction to Ethics  
PHI 240 Topics in Business Ethics  
PHI 245 The Philosophy of Science  
PHI 246 Philosophy of Art  
REL 100 Introduction to Religion I  
REL 101 Introduction to Religion II  
REL 322 Phenomenology of Religion  
SSA 109 Introduction to Anthropology  
SSA 207 North American Natives

### **3. Honours Requirements:**

90-credit program, 60-credit Honours

Same Required courses as for the Major, plus:

ESG 461a Honours Research Proposal

ESG 462b Honours Thesis

Six additional ESG credits, for a total of 60 ESG credits.

A minimum of 70% overall average

Note: Some of the required courses listed may have one or more prerequisites. It is the student's responsibility to ensure these prerequisites are completed; these completed prerequisites may be counted as Electives.

### **B) Geography Concentration**

1. For a Major, the student must take at least 45 credits in Environmental Studies and Geography. Honours and Majors students must complete ESG126a, 127b, 260a and 261b.

## **2. Honours Requirements:**

Honours in the Geography Concentration requires at least 60 credits in Environmental Studies and Geography, including ESG 461a and ESG 462b. The Honours program requires a minimum 70% average and permission of the Department.

### **Departmental regulations of particular note include:**

ESG 126 and ESG 127 are normally prerequisites for all upper-year courses.

### **Departmental Minors:**

#### **Environmental Studies Minor**

The Environmental Studies Minor encompasses the study of several major natural systems including the atmosphere, the hydrosphere and the lithosphere, as well as the effects of human activities on the three systems. The program is intended to provide students with an interdisciplinary approach to the natural environment, an approach that is embedded in the Liberal Arts and Science tradition of Bishop's University. The objectives of the program are not only to equip students with the scientific knowledge of their environment, but also to enrich this knowledge with a study of the social, political and policy aspects necessary to effectively analyse complex environmental systems.

The Environmental Studies Minor consists of the following four required courses:

- ESG 100 Introduction to Environmental Studies
- ESG 126 Introduction to Human Geography
- ESG 127 Introduction to Physical Geography
- ESG 224 Human Impact on the Environment

In addition, students must take four more ESG courses for a total of 8 courses, 24 credits, from the Department of Environmental Studies and Geography.

#### **Geography Minor**

The Geography Minor consists of two required courses, ESG 126 and ESG 127 plus six additional ESG courses for a total of 24 credits from the Department of Environmental Studies and Geography.

Note: In keeping with the new Departmental name, as of the 2001-2002 academic year all Departmental course codes are changed from GEO to ESG. Since the course numbers, descriptions and content remain the same, GEO and ESG courses with the same course number are treated as the same course under all University Calendar rules and regulations.

ESG 100 Introduction to Environmental Studies 3-3-0

An introductory approach toward understanding the global environment and the human impact on this environment. Topics covered include processes operating in natural systems, the identification of problems caused by human interaction with these systems, solutions to these problems and the implementation of possible solutions.

ESG 126 Introduction to Human Geography 3-3-0

An introduction to the field of human geography; its scope and methods. The aim is to focus on the relationship between people and their environment, including population trends, resource use, political and economic forces and urban planning.

ESG 127 Introduction to Physical Geography 3-3-0

An introduction to the principles and methods of climatology and geomorphology. Topics discussed include Earth's radiation balance, atmospheric wind systems, major climate types, and the work of geomorphic agents, such as water and wind, on the development of physical landscapes.

ESG 162 Canada: A Nation of Regions 3-3-0

This course examines Canada's evolving regional geography through an exploration of the natural, social, political, cultural and economic forces involved in creating a distinctly Canadian landscape. The course divides Canada into various regions: The Atlantic Region, St. Lawrence-Great Lakes Lowlands, The Canadian Shield, The Western Interior, British Columbia and The North in an effort not only to understand the vast differences within Canada, but also to deepen our understanding of Canada as a whole.

ESG 163 Introduction to Landscape and Cultural Geography 3-3-0

Cultural geography is concerned with making sense of people and the places that they occupy, an aim that is achieved through analysis and understandings of cultural processes, cultural landscapes and cultural identities. This course explores contemporary cultural geography and landscape studies by applying and evaluating - at different scales - the concepts of

cultural diffusion, cultural region, cultural ecology and cultural landscape. Particular attention will be placed on interpretations of how cultural spaces are constructed, contextualized and conserved.

ESG175 Economic Geography 3-0-0

The production of, and trade in, goods and services vary by city, region, and country. In recent years, these spatial variations have widened in some cases, and narrowed in others. But common to all are the drivers-of-change. These include major geo-political events, the adoption of innovative cost-saving practices, and the creation and evolution of entrepreneurial networks and industrial clusters. This course will explore the key elements of these dynamics, and explore the ongoing debate about the appropriate role of government in an increasingly-globalized world.

*This course is cross-listed with ECO 175.*

ESG 211 Historical Geography of the Eastern Townships 3-3-0

A retrospective approach to the Eastern Townships blending history and landscape. Various themes will be presented to examine the principle elements of landscape change during the 19th and 20th centuries in relation to the spread of the agricultural frontier, the changing cultural geography of the region, and the introduction of the area as a recreational retreat.

ESG 224 Human Impact on the Environment 3-3-0

Changing environmental relationships in the modern context of population growth and technological advance. The human impact on the world's atmosphere and climate, water, land and soils, vegetation, and animal life.

*Prerequisite: ESG 100 and ESG 126*

ESG 226 Oceans I 3-3-0

An introduction to physical, geological and chemical oceanography. Topics to be covered include: the history of oceanography, the origin of the ocean basins, marine sediments, seawater properties, ocean climates, waves, tides and other physical characteristics of the coastal margins.

*Prerequisite: ESG 127 or permission of the Instructor*

ESG 227 Oceans II 3-3-0

An introduction to the interaction between the oceans and society at large. Topics will include: marine organisms of economic value, food and mineral production from the oceans, coastal development, marine pollution, ocean lifestyles and legal problems concerning the use of the oceans.

*Prerequisite: ESG 226a (Oceans I) or ESG 127*

ESG 249 Resource Management 3-3-0

This course examines the interactions between natural and social processes in the development, use and conservation of natural resources. Theories and concepts explored are: integrated resource management, ecosystem management, adaptive management and the role of public participation. Case studies explore trends in forestry, fisheries, agriculture, mining, wildlife and water management.

*Prerequisites: ESG 100*

ESG 250 Geomorphology 3-3-0

Selected topics in geomorphology with particular emphasis on fluvial processes and land forms of southern Quebec. Aspects of applied physical geography may be covered. Fieldwork is an integral part of this course.

*Prerequisite: ESG 127*

ESG 251 Soils and Vegetation 3-3-0

The systematic examination of the development and distribution of the major soil and vegetation types of the world and of the ways in which these elements of the physical environment have become resources subject to varying utilization patterns.

*Prerequisite: ESG 127*

ESG 260 Research Methods 3-3-0

An introduction to research methodology and its application to environmental studies and geography. Course modules include research design, hypothesis testing, sampling techniques, interview techniques, archival techniques and other approaches to primary and secondary data gathering.

*Prerequisite: ESG 126 and ESG 127*

ESG 261 Quantitative Methods 3-3-0

Quantitative methods in environmental studies and geography; the nature of explanation; problems of observation and data collection; descriptive statistical analysis; inferential statistical analysis.

*Prerequisite: ESG 126 and ESG 127*

ESG 262 Introduction to Geographic Information Systems 3-3-0

An introduction to geographic information systems including cartographic concepts, basic remote sensing (aerial photography and digital imagery), vector and raster digital spatial data models, data input and editing, database management, structured query language, and elementary spatial analysis.

*Prerequisites: ESG 126 and 127; Open only to ESG students in the Environmental Studies Concentration*

ESG 264 Outdoor Recreation 3-3-0

This course examines: (i) theories and concepts concerning the recreational use of natural settings (the human dimensions), (ii) the nature, capabilities and limitations of natural settings (the natural dimensions) and, (iii) the institutional arrangements which exist to manage outdoor recreation settings (the management dimensions), including the role of national parks and protected areas.

*Prerequisite: ESG 100 or ESG 126*

ESG 265 The Atmosphere and Weather 3-3-0

A comprehensive description of the principal characteristics of Earth's atmosphere including air temperature, density, pressure and moisture; the development of clouds, wind and precipitation, and physical explanations of weather events such as mid-latitude cyclones, thunderstorms and hurricanes.

*Prerequisite: ESG 127 or permission of the Instructor*

ESG 266 Environmental Policy 3-3-0

An introduction to the field of environmental policy, with an emphasis on the regulation of technological hazards. Consideration will also be given to different approaches to environmental policy, including "command-and-control" regulation and enforcement as well as the emergence of market incentives and voluntary initiatives. Topics will include: air quality, water quality, solid and hazardous waste, toxic substances, pollution-prevention and environmental assessment.

*Prerequisite: ESG 224a or permission of instructor*

ESG 267 Global Environmental Change: a physical perspective 3-3-0

An examination of the general trends and concepts associated with global environmental change using a physical geographic approach. This includes analysis of the complex interlinkages of the atmosphere-ocean-terrestrial-biosphere systems, of environmental changes during the Quaternary Period, and of the environmental issues associated with these changes. The human response to global environmental change will be covered in less detail.

*Prerequisite: ESG 100 and ESG 127*

ESG 268 The Human Landscape and Environmental Change 3-3-0

This course uses various aspects of environmental change to identify links between the sciences and the humanities. A convergence of these two conceptual approaches can provide a more holistic understanding of the long-term processes impacting both human and physical environments. How different cultures conceptualise their relationships with the physical environment is central to how environmental management decisions are made.

*Prerequisite: ESG 100, ESG 126, ESG 162 or ESG 163*

ESG 269 The Earth's Crust 3-3-0

The course is a general study of the materials and dynamics of Earth's crust. Included are geologic and topographic maps, geological time scales; an examination of minerals and fossils, igneous, metamorphic and sedimentary rocks; discussion of processes such as: sedimentation, vulcanism, plutonism, deformation and seismology; and, an introduction to plate tectonics, orogenies

*Prerequisite: ESG 127*

ESG 300 Environmental Studies Seminar 3-3-0

Selected topics in Environmental Studies will be examined. The course allows detailed study of particular areas of environmental research through student-led seminars and general class discussion.

*Prerequisites: ESG 224 and 267; open only to U3 ESG Honours and Majors in the Environmental Studies Concentration*

ESG 339 The Canadian Arctic 3-3-0

The ecology of traditional Eskimo occupance; socio-economic change through contact with explorers, whalers, traders, missionaries, and administrators. Demographic centralization; industrial development; nunamiut and kabloonamiut; frontier or homeland? The outlook for renewable resources. Problems of sovereignty over arctic space.

*Prerequisite: ESG 100, ESG 126, ESG 162 or ESG 163*

ESG 340 The Circumpolar North 3-0-0

An introduction to the physical and cultural geography of the Circumpolar North. This course will focus upon the cultural and political ecology of the human population in this region. The emphasis will be upon the contexts of human life and human experience in the North. This course also includes discussions of the northern landscape: nunamiut and kabloonamiut; demographic centralization; challenges to sovereignty over arctic space. The emphasis will be on lectures and class participation. There will be time set aside to discuss lecture topics and to add concerns of interest to the students; class participation is highly encouraged.

*Prerequisite: ESG 100, ESG 126, ESG 162 or ESG 163*

ESG 346 Independent Study I 3-0-0

Open to U3 majors and honours students at the discretion of the Department.

ESG 347 Independent Study II 3-0-0

Open to U3 majors and honours students at the discretion of the Department.

ESG 348 Urban Planning 3-3-0

Consideration of several aspects of the city planning process: the legal basis of planning, the official Plan, zoning, transportation, planning procedure and implementation, the goals of planning.

*Prerequisite: ESG 126 or permission of the instructor.*

ESG 349 Watershed Management 3-3-0

This course examines integrated watershed management, including assessment of biophysical freshwater systems, implications of natural resource development and land use on water quality and quantity, as well as institutional arrangements and the role of stakeholder involvement in watershed-scale decision-making. Field studies in the St. Francis River Watershed.

*Prerequisite: ESG 249*

ESG 350 Environmental Justice 3-3-0

An introduction to the field of environmental justice, with an emphasis on fairness and equity in environmental management. The course will examine the history of activism and the development of theoretical work and empirical evidence regarding the connections between race, class and the environment.

*Prerequisite: ESG 224a or permission of instructor*

ESG 353 Landscape 3-3-0

This course explores landscapes as products of interacting physical and human processes, and examines how those processes can change landscapes over time. The course uses an integrated approach to examine and interpret contemporary landscapes and reconstruct landscapes of the past, and highlights the utility of landscape science for environmental management applications. The course will be conducted through lectures and student-led seminars.

*Prerequisite: ESG 126 and ESG 127*

ESG 354 Environmental Impact Assessment 3-3-0

Environmental impact assessment (EIA) is intended to provide a basis for deciding whether and how to proceed with a proposed resource development project so as to prevent or minimize environmental degradation. This course will examine the theory, methods, regulatory frameworks and social implications of EIA with emphasis on recent Canadian case studies.

*Prerequisite: ESG 249*

ESG 358 International Environmental Issues 3-3-0

Environmental factors and their impact on global agricultural production, population growth and distribution. Fresh water and its effect on socio-economic development and political stability. Issues in trans-boundary pollution are discussed. Case studies from developed and developing countries.

*Prerequisite: ESG 224a or permission of the instructor.*

ESG 361 Glacial Environments 3-3-0

The study of processes in glaciated environments. Particular emphasis will be placed on the effects of past glaciations on the Canadian landscape and on the action of contemporary Canadian glaciers. Arctic and alpine environments provide many excellent examples of these processes.

*Prerequisite: ESG 250a or permission of instructor.*

ESG 362 Advanced Geographic Information Systems 3-3-0

Project-based applications stress the utility of advanced GIS analysis in environmental studies and geography.

*Prerequisite: ESG 262*

ESG 363 Natural Hazards 3-3-0

The course is an examination of the occurrence, nature and explanation of hazardous natural processes. Attention will be given to defining natural hazards, describing their physical characteristics and discussing the human response to these events. Geological hazards, such as earthquakes, floods and volcanoes, and climatological hazards, such as hurricanes, tornadoes and blizzards, will be studied.

*Prerequisite: ESG 250a, ESG 269 or ESG 265*

ESG 364 Field Course in Geography 3-0-0

The course will introduce students to field techniques and data collection and analysis in human and physical Geography. Data collection will take place during a week-long field camp held the week prior to the beginning of Fall Semester classes. During the semester students will meet weekly with a faculty advisor to discuss the Field Course Report. Final submission and oral presentation of the Report will occur at the end of the semester. A field camp fee will be assessed.

*Prerequisite: Open to U3 majors and honours students at the discretion of the Department.*

ESG 365 Mid-Latitude Weather Systems 3-3-0

Examination of several of the major factors in mid-latitude cyclones including: air masses, upper and middle atmospheric structure, baroclinic instability, vorticity, divergence and geostrophic flow. Discussion of normal and extreme weather events such as blizzards, thunderstorms, extra-tropical cyclones, tornadoes and Nor'easters. An introduction to weather forecasting and weather on the internet.

*Prerequisite: ESG 265*

ESG 366 Ethical Perspectives on Environmental Problems 3-3-0

An introduction to the major philosophical traditions in the field of environmental ethics: natural law, utilitarianism, virtue theory and deontology. The use of case studies in environmental problems, e.g. ocean dumping, nuclear wastes, air pollution, greenhouse gases, etc., as a way of exploring several contemporary positions such as biocentrism, ecocentrism, the land ethic and deep ecology.

*Prerequisite: ESG 126 and ESG 127*

ESG 367 Climate Change 3-3-0

The course examines the debate surrounding global climate change with climatic and paleo-climatic perspectives. The climate system's natural variability, and predicted impacts and environmental implications are examined. The course will include a short review of the present climate system, and a section on the Holocene climate. We will also examine how predictive climate models are developed and tested against recent and Holocene paleo-climatic data.

*Prerequisite: ESG 267*

ESG 370 Special Topics in Environmental Studies and Geography 3-3-0

A lecture/seminar course offered by regular and visiting faculty on environmental/geographical topics related to their research interests. Topics are determined by the instructor therefore content of the course varies year by year. The course will be offered on an occasional basis.

*Prerequisite: Open only to U3 Honours and Majors in Environmental Studies and Geography.*

ESG 461a Honours Research Proposal 3-0-0

An introduction to the planning, execution and reporting of Environmental and Geographic research. The student is required to select an appropriate research project and, under the supervision of a faculty member, complete a formal research proposal. The proposal must include a detailed Introduction, including the purpose, objectives and research hypothesis, a detailed Conceptual Background, with associated Literature Review and Bibliography, and a description of the Research Methods and Data Collection Techniques to be used in the project. Preliminary data collection should also take place. The Proposal will be presented at a Departmental seminar to be scheduled during the last two weeks of classes.

*Prerequisite: Permission of Department*

ESG 462b Honours Thesis 3-0-0

The continuation of ESG 461. Information and data collected for the Honours Research Proposal, plus additional data collected will be analysed, discussed and presented in an Honours thesis. Research findings will be presented at a Departmental seminar to be scheduled during the last two weeks of classes; the final submission of the thesis must occur before the last day of the formal examination period. The completion of both ESG 461 and ESG 462 is necessary to satisfy the requirements for Honours in Environmental Studies and Geography.

*Prerequisite: ESG 461 and permission of the Department*