

Environment and Geography

Faculty

Darren Bardati,

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Program Overview

The Department of Environment and Geography offers a wide variety of courses focusing on the intersection of humans and the natural environment. In order for a complete understanding of the human-environment interactions, students need to understand the science of the natural world, and the impacts humans are having on their environment, whether they be at a local, regional or global scale. We must understand how and why the environment is changing. Climate change, acid precipitation, ozone depletion, waste management, food systems, and water conservation are issues which require thorough examination in or 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.

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.

Environment and Geography Programs

B.A. Geography

- Honours in Geography, 60 credits
- Major in Geography, 45 credits
- Minor in Geography, 24 credits

B.A. Environmental Studies

- Honours in Environmental Studies, 60 credits
- Major in Environmental Studies, 48 credits
- Minor in Environmental Studies, 24 credits

B.Sc. Environmental Science

- Honours in Environmental Science, 81 credits
- Major in Environmental Science, 75 credits
- Minor in Environmental Science, 24 credits

We also offer:

- Undergraduate "Certificate in Environmental Studies and Geography", 30 credits
- Graduate-level "Micro-Program in Climate Change", 9 credits

NOTES (all programs):

Due to the abundant overlap in core and additional required courses, a student cannot double major in any two ESG programs (e.g. double major in Geography and in Environmental Studies). Neither can a student major in one ESG program and minor in another ESG program.

Please note that the complete list of courses to be taken within each program is outlined in the *Table 1*.

TABLE 1 – ESG UNDERGRADUATE PROGRAMS

B.A. Geography	Geography Honours (60 credits)	Geography Minor (24 credits)
Geography Major (45 credits)	HONGEO	MINGEO
MAJGEO	<i>Same as Geography Major, plus:</i>	Core (2 courses or 6 credits)
Core (4 courses or 12 credits)	Core (2 courses or 6 credits)	ESG 126 Intro Human Geography
ESG 126 Intro Human Geography	ESG 461 Honours Proposal	ESG 127 Intro Physical Geography
ESG 127 Intro Physical Geography	ESG 462 Honours Thesis	<i>Additional required: Any 6 courses (18 credits) from the ESG department</i>
ESG 260 Research Methods	<i>Additional required: Any 3 courses (9 credits) from the ESG department</i>	
ESG 261 Quant. Methods (or any quantitative methods course from among the following: BMA140, PMA260, or PHY101)		
<i>Additional required: Any 11 courses (33 credits) from the ESG department</i>		

TABLE 1 (cont.) – ESG UNDERGRADUATE PROGRAMS

Certificate in Environmental Studies and Geography

CONESG

(10 courses or 30 credits)

ESG 100	Intro to Env Studies
ESG 126	Intro Human Geography
ESG 127	Intro Physical Geography

Additional required: Any 7 courses (21 credits) from the ESG department.

B.A. Environmental Studies**Environmental Studies Major (48 credits)** MAJEST**Core (10 courses or 30 credits)**

ELA 116	Effective Writing (or any University-level English literature 3-credit course)
ESG 100	Intro to Env Studies
ESG 126	Intro Human Geography
ESG 127	Intro Physical Geography
ESG 224	Human Impact of the Env
ESG 260	Research Methods
ESG 261	Quant. Methods (or any quantitative methods course from among the following: BMA140, PMA260, or PHY101)
ESG 262	Intro to GIS
ESG 267	Global Env Change
ESG 300	Environmental Studies Seminar

Additional required: Any 6 courses (18 credits) from the ESG department

Environmental Studies Honours (60 credits)

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Same as Environmental Studies Major, plus:

Core (2 courses or 6 credits)

ESG 461	Honours Proposal
ESG 462	Honours Thesis

Additional required: Any 2 courses (6 credits) from the ESG department

Environmental Studies Minor (24 credits) MINEST**Core (2 courses or 6 credits)**

ESG 100	Intro to Env Studies
ESG 126	Intro Human Geography
ESG 127	Intro Physical Geography
ESG 224	Human Impact of the Env

Additional required: Any 4 courses (12 credits) from the ESG department

B.Sc. Environmental Science**Environmental Science Major (75 credits)** MAJENV**Core (13 courses or 39 credits)**

MAT 198	Calculus I (for Life Sciences)
MAT 199	Calculus II (for Life Sciences)
PHY 193	Physics for Life Sciences I & Lab
PHY 194	Physics for Life Sciences II & Lab
CHM 191	General Chemistry I & Lab
CHM 192	General Chemistry II & Lab
BIO 196	Intro to Biology I & Lab
BIO 207	General Ecology & Lab
ESG 100	Intro to Env Studies OR ESG126 Intro Human Geo
ESG 127	Intro to Physical Geography
ESG 260	Research Methods
ESG 261	Quant. Methods OR PHY101 Statistical Methods
ESG267	Global Environmental Change

*Additional required DNS courses:
Any 5 courses (15 credits) from this list:*

PHY 206	Waves and Optics & Lab
PHY 207	Thermal and Fluid Physics & Lab
CHM 111	Organic Chemistry I & Lab
CHM 141	Analytical Chemistry & Lab
CHM 241	Environmental Chemistry I & Lab
CHM 242	Environmental Chemistry II & Lab
BIO 111	Organic Gardening
BIO 205	Diversity of Life I & Lab
BIO 206	Diversity of Life II & Lab
BIO 321	Biogeography
BIO 327	Advanced Ecology

*Additional required ESG courses:
Any 7 courses (21 credits) from this list:*

ESG 226	Physical Oceanography
ESG 227	Biogeochemical & Environmental

Oceanography

ESG 250	Geomorphology
ESG 251	Soils & Vegetation
ESG 265	Atmosphere & Weather
ESG 269	Earth's Crust
ESG 349	Watershed Management
ESG 354	Environmental Impact Assessment
ESG 361	Glacial Environments
ESG 363	Natural Hazards
ESG 364	Field Course
ESG 365	Mid-Latitude Weather Systems
ESG 367	Climate Change

Environmental Science Honours (81 credits) HONENV

Same as Environmental Science Major, plus

Core (2 courses or 6 credits)

ESG461	Honours Proposal
ESG462	Honours Thesis

Environmental Science Minor (24 credits) MINENV**Core (3 courses or 9 credits)**

ESG100	Intro to Env Studies
ESG127	Intro Physical Geography
ESG261	Quant. Methods
OR	
PHY101	Statistical Methods

*Additional required DNS courses:
Any 3 courses (9 credits) from the list of additional required DNS courses for the Environmental Science Major*

*Additional required ESG courses:
Any 2 courses (6 credits) from the list of additional required ESG courses for the Environmental Science Major*

List of Courses

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.

ESG 175 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 or ESG 126

ESG 226 Physical Oceanography 3-3-0

An introduction to physical and geological oceanography. Topics to be covered include: the history of oceanography, plate tectonics and the origin of the oceans basins, marine sediments, seawater properties, ocean climates, geostrophic currents, deep ocean circulation, waves and tides.

Prerequisite: ESG 127

ESG 227 Biogeochemical and Environmental Oceanography 3-3-0

An introduction to marine life and the interaction between the oceans and society at large. Topics will include: biological productivity (phytoplankton, zooplankton), biogeochemical cycles in the oceans, life in various marine habitats, marine resources, fisheries, mariculture, pollution, coastal development and other environmental issues affecting the oceans.

Prerequisite: ESG 226 or ESG 127

ESG 248 Geography of Food 3-3-0

This course examines the growing harvesting, processing, packaging, transporting, marketing, consumption, and disposal of food and food-related items. By employing spatial concepts and analysis the impacts of food systems on the natural environment, this course examines conventional/industrial food systems, as well as alternatives such as organic food, local food, community-supported agriculture, farmers' markets, slow food movements and others.

Prerequisites: ESG 100 and ESG 126

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.

Prerequisite: 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 environment 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.

Prerequisite: ESG 126 and ESG 127

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 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

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 224

- 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: Any one of 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. Students will learn about igneous, metamorphic sedimentary rocks, rock weathering and transport of material at the surface. They will also learn the basic principles of physical geology and how the Earth works: volcanic activity, earthquakes, rock deformation, mountain building, and plate tectonics. We will also explore the vastness of geologic time.
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 ESG 267; open only to U3 ESG Honours and Majors in Environmental Studies
- ESG 339 The Canadian Arctic 3-3-0**
The ecology of traditional Eskimo occupancy; 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: Any one of 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: Any one of ESG 100, ESG 126, ESG 162 or ESG 163
- ESG 346 Independent Study I / Internship I 3-0-0**
The student is required to select an independent research project or internship, and, under the supervision of a faculty member, complete a formal report. Open to U3 majors and honours students at the discretion of the Department.
- ESG 347 Independent Study II / Internship II 3-0-0**
The student is required to select an independent research project or internship, and, under the supervision of a faculty member, complete a formal report. 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.
- 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 224
- 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 224.
- 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 250.
- ESG 362 Advanced Geographic Information Systems 3-3-0**
Project-based applications stress the utility of advanced GIS analysis in environment 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: Any one of ESG 250, ESG 269 or ESG 265
- ESG 364 Field Course in Environment and Geography 3-0-0**
The course will introduce students to field techniques and data collection and analysis in human, environmental and physical geography. Sometimes offered during Spring semester, depending on faculty resources and student enrollments. 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 Environment 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 Environment and Geography.

ESG 461a Honours Research Proposal**3-0-0**

An introduction to the planning, execution and reporting of Environment and Geography 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 Environment and Geography.

Prerequisite: ESG 461 and permission of the Department

Politics and International Studies

Faculty

Don Dombowsky,

B.A. (Concordia), M.A. (New School for Social Research), Ph.D. (Ottawa);
Assistant Professor

Gilbert Gagné,

B.A., B.Soc.Sc., M.A.(Ottawa), D.Phil.(Oxford);
Full Professor

Sarah-Myriam Martin-Brûlé

B.Sc. (Université de Montréal), M.Sc. (Université de Montréal), Ph.D. (McGill University);
Associate Professor

Heather McKeen-Edwards,

B.A. (Manitoba), M.A., Ph.D. (McMaster);
Associate Professor
Chair of the Department

Andrew J. Stritch,

B.A. (Exeter), M.A. (Lancaster), Ph.D. (Queen's);
Full Professor

Trygve Ugland,

Cand.mag., Cand.polit.(Oslo and Queen's Belfast),
Dr.polit.(Oslo);
Full Professor

Program Overview

Knowing the political system increases one's capacity for choice. Therefore, a knowledge of how political systems work in Canada and abroad, as well as the impact of globalization on the emergence of a new international economic and political order, presents a student with not only an understanding of power, authority and decision making in the system but also with greater opportunities and advantages within their society. Lectures, seminars and individual tutorials are normal methods of instruction and the department stresses personal contact with students as much as possible in order to assist them in choosing a postgraduate career in government, business, non-profit or the academic fields. Guest lectures are given by visiting politicians, academics, interest group representatives and industry leaders.

The department offers the following programs of study: Honours, Major and Minor in Political Studies; Honours, Major and Minor in International Studies; Honours and Major in International Political Economy.