

# ENVIRONMENTAL SCIENCE (ENSC)

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## **ENSC 103 Environment and Sustainability Units: 3.00**

An interdisciplinary approach to complex environmental issues, and diverse perspectives on environmental management and sustainability. The course considers the social and scientific aspects of environmental problems and the production of environmental knowledge alongside global linkages, human health implications and barriers to sustainability.

**Learning Hours:** 120 (24 Lecture, 12 Tutorial, 24 Online Activity, 60 Private Study)

**Requirements:** Prerequisite None.

**Course Equivalencies:** ENSC103; ENSC203

**Offering Faculty:** Faculty of Arts and Science

### **Course Learning Outcomes:**

1. Adopt and make accurate use of disciplinary language to communicate on environmental issues with a variety of audiences.
2. Apply concepts and practices of ecological citizenship.
3. Competently explain key terms for course (e.g. Sustainability, Indigeneity, etc.)
4. Critique constructively the dominance of individualism and voluntary action as core social beliefs in mainstream society.
5. Evaluate the impact of the intersection of scientific and social aspects of a variety of environmental issues.
6. Explore personally the possibilities and/or limitations of individual actions in relation to sustainability.
7. Identify and explain the contested aspects of environmental knowledge (e.g. Around climate change, scientific uncertainty, etc.).
8. Identify relative importance and verifiability of scientific and social aspects of environmental issues.

## **ENSC 200 Environmental History Units: 3.00**

A history of the relations between humans and nature through time, with special emphasis on how science has influenced how we perceive our place in nature, and how we define and understand environmental issues.

**Learning Hours:** 120 (24 Lecture, 12 Tutorial, 84 Private Study)

**Requirements:** Prerequisite (Level 2 or above) or permission of the School. Exclusion ENSC 245/3.0; HIST 257/3.0.

**Offering Faculty:** Faculty of Arts and Science

### **Course Learning Outcomes:**

1. Informed understandings of the complex interactions between societies and their environments.
2. Understand and be able to critically reflect upon the relationship between ongoing settler colonialism and consumption in Canada.
3. Enhanced critical thinking and effective communication skills.
4. Enhanced research and writing abilities.

## **ENSC 201 Environmental Toxicology and Chemical Risks Units: 3.00**

Introduction to global issues and problems in environmental toxicology. Possible topics include waste disposal, pesticides, chemical warfare, pulp and paper mills and genetically modified foods. This course will be of interest to students with either a science or a humanities background.

**Learning Hours:** 120 (24 Lecture, 12 Tutorial, 84 Private Study)

**Requirements:** Prerequisite (Level 2 or above) or permission of the School.

**Offering Faculty:** Faculty of Arts and Science

### **Course Learning Outcomes:**

1. Interpret and analyze basic toxicological data.
2. Communicate environmental toxicology concepts in oral and written formats.
3. Explain and define key environmental toxicology terms (e.g. toxicant, endpoint, LD50).
4. Explain the interactions of hazard, exposure, receptors, and risk for various pollutants, using examples.
5. Independently research and present the key toxicology and risk aspects of an environmental issue.

**ENSC 230 Principles of Sustainability Units: 3.00**

The principles of sustainability provide a focus for discussing global and regional environmental issues in the broadest possible perspective. Frameworks for sustainability and how they are used in understanding various environmental problems will be explored, including in terms of messaging, claims, feasibility and expected outcomes.

**Learning Hours:** 120 (24 Lecture, 12 Tutorial, 36 Online Activity, 48 Private Study)

**Requirements:** Prerequisite ENSC 103/3.0. Exclusion ENSC 390/3.0.

**Offering Faculty:** Faculty of Arts and Science

**Course Learning Outcomes:**

1. Critique approaches to sustainability in terms of claims, feasibility, and expected outcomes.
2. Describe core concepts and theory related to sustainability.
3. Link the concepts of planetary boundaries, resilience, and global governance to sustainability solutions.
4. Understand the impact of messaging and communications in defining and advancing sustainability.

**ENSC 245 Consuming the Environment Units: 3.00**

This course critically explores consumption as a major contributor to climate change and social injustice. The course will emphasize the relationships between consumption and ongoing settler colonialism, environmental racism and gender discrimination.

**Learning Hours:** 120 (24 Lecture, 12 Tutorial, 84 Private Study)

**Requirements:** Prerequisite (Level 2 or above) or permission of the School. Exclusion ENSC 200/3.0.

**Offering Faculty:** Faculty of Arts and Science

**Course Learning Outcomes:**

1. Understand and be able to communicate through writing how consumption is a Canadian and global social justice issue, involving inclusion, diversity, equity and Indigenous sovereignty issues.
2. Critically assess the role and importance of the relations between material and social processes.
3. Critical assessments of the ways in which differing theoretical and methodological approaches might be deployed to understand consumption as social justice issues, involving environmental, social, political, economic, and cultural interactions.
4. Demonstrate critical thinking and effective communication skills, including through written assignments, addressing the multidisciplinary topic of consumption.

**ENSC 290 Introduction to Ecological Economics Units: 3.00**

This course includes a combination of lectures, assignments and case studies that are designed to introduce students to the ecological critique of the standard neo-classical economic analysis of environmental degradation and depletion. Students will also be asked to consider the more holistic approach to calculating the costs and benefits of economic activity proposed by ecological economists.

**Learning Hours:** 120 (36 Lecture, 84 Private Study)

**Requirements:** Prerequisite Level 2 or above or permission of the School. Note This course may not be used towards the requirements of an ECON Plan.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 301 Environmental Assessment Units: 3.00**

The course explores components of environmental assessment including public consultation, scoping, alternatives, protocols, significance, trade-offs, mitigation and monitoring. Biophysical, cumulative, social, strategic and sustainability assessment through case studies highlight strengths and weaknesses of the environmental assessment process.

**Learning Hours:** 114 (12 Lecture, 24 Group Learning, 78 Private Study)

**Requirements:** Prerequisite Level 3 or above.

**Course Equivalencies:** ENSC301, ENSC401

**Offering Faculty:** Faculty of Arts and Science

**Course Learning Outcomes:**

1. Develop the skills necessary to start at an entry level environmental assessment job with the government, private sector, or NGO sectors.
2. Grasp main environmental assessment concepts - scoping, alternatives, significance, trade-offs, harmonization, public consultation.
3. Identify valued ecosystem components (VECs) and know how these are used to scope environmental assessment processes.
4. Recommend specific environmental assessment impact studies for a specific case.
5. Understand design of environmental assessment processes.
6. Understand the main types and steps of environmental assessment.

**ENSC 307 Marine Environmental Issues Units: 3.00**

Marine issues such as fisheries and aquaculture, climate change, oil and gas development, shipping, coastal development and marine protected areas will be explored in the context of factors that create environmental problems and the steps that are being taken to solve them. Assignments are modeled on real-world examples to develop skills for creating positive change to promote sustainable practices. This course will be highly complementary to other courses in Oceanography or Limnology (GEOL 200, BIOL 335, GPHY 303).

**Requirements:** Prerequisite (Level 3 or above) or permission of the School. Exclusion BIOL 338.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 310 Environmental Policy Units: 3.00**

This course introduces political science and public policy within the context of environmental politics, policy, and administration. The purposes of policy, the makers of policy, and the tools at their disposal will be analyzed within the institutional context of environmental policy-making.

**Learning Hours:** 132 (24 Lecture, 12 Tutorial, 36 Online Activity, 60 Private Study)

**Requirements:** Prerequisite (Level 3 or above) or permission of the School.

**Offering Faculty:** Faculty of Arts and Science

**Course Learning Outcomes:**

1. Appreciate that environmental governance is multilevel (i.e., occurs at local, regional, national, and global levels) and that interactions between these levels can be complex and contentious.
2. Have some of the skills required to advocate effectively for better environmental policy.
3. Recognize how other areas of policy (e.g., trade policy) can conflict with environmental policy and hinder progress on environmental objectives, and that the mainstreaming of environmental values/principles across government is critical.
4. Understand how different actors influence the development of environmental policies.
5. Understand the competing perspectives on the best way to approach environmental policy.



### **ENSC 315 Sustainable Food Systems Units: 3.00**

This course is about the production and consumption of food on global and local scales. It provides an interdisciplinary look at the relationships shaping food systems. It examines how food systems have become globalized and industrialized and the implications for the environment and social justice. Solutions and alternatives are explored.

NOTE Field Trip: estimated cost \$30.

**Learning Hours:** 132 (24 Lecture, 12 Group Learning, 36 Online Activity, 12 Off-Campus Activity, 48 Private Study)

**Requirements:** Prerequisite Level 3 or above.

**Offering Faculty:** Faculty of Arts and Science

#### **Course Learning Outcomes:**

1. Engage and apply interdisciplinary perspectives to the study of food systems.
2. Critically interrogate the state of food systems and reflect on their own relationships with food.
3. Understand key issues and trends in the food system in the local area, including opportunities for community engagement.

### **ENSC 320 Wildlife Issues in a Changing World Units: 3.00**

A lecture/seminar course focusing on the notion of wildlife; laws governing wildlife protection and use; the effects of overexploitation, habitat destruction, and introduced species, and management plans and strategies.

**Requirements:** Prerequisite Level 3 or above. Exclusion BIOL 422/3.0.

**Offering Faculty:** Faculty of Arts and Science

#### **Course Learning Outcomes:**

1. Apply basic theories of wildlife conservation science to "real-world" examples through the presentation and interactive analysis of case studies.
2. Explore past and current issues in wildlife use, management, and conservation at both species and ecosystem levels.
3. Explore the concept of wildlife as well the ecological foundations of, and societal basis for, its conservation.
4. Foster independent learning and critical thinking.
5. Identify current threats to wildlife at local, regional, national, and international scales.
6. Survey relevant institutional arrangements, including species-based regulations and legislation and habitat protection.
7. Understand how your own philosophy and perspectives on wildlife issues relate to the wide diversity of perspectives in this area.

### **ENSC 321 Environmental Justice in Global Context Units: 3.00**

Examines the socially uneven effects across race, class, gender and nation of environmental problems such as toxic waste disposal, air pollution, climate change, deforestation and environmental disasters and the responses to them from local to global movements, protests and politics.

**Learning Hours:** 150 (18 Lecture, 18 Seminar, 6 Online Activity, 108 Private Study)

**Requirements:** Prerequisite Level 3 or above.

**Offering Faculty:** Faculty of Arts and Science

#### **Course Learning Outcomes:**

1. Apply concepts of environmental justice to specific environmental issues.
2. Appreciate the contributions of global political economy, global development studies, and social science theories of environmental justice.
3. Foreground global and local inequalities as they shape production and outcomes of environmental problems.
4. Identify gaps in environmental justice approaches.
5. Identify impacts of social equality and conflicts of power in environmental
6. undefined

**ENSC 330 Applications of Sustainability Units: 3.00**

Applications of sustainability are used to address environmental problems and develop solutions in areas from resource management to regional planning. Emphasis will be on multidisciplinary approaches in research and communications. Methods and indicators for sustainability assessment will be critically examined using case studies and considering expected outcomes.

**Learning Hours:** 132 (24 Lecture, 12 Tutorial, 12 Group Learning, 36 Online Activity, 12 Off-Campus Activity, 36 Private Study)

**Requirements:** Prerequisite ENSC 230. Exclusion ENSC 390.

**Offering Faculty:** Faculty of Arts and Science

**Course Learning Outcomes:**

1. Be able to work effectively and collegially in an interdisciplinary team.
2. Evaluate sustainability initiatives through application of indicators and monitoring.
3. Link the main concepts of sustainability (integration, equity, efficiency, precaution, scale, etc.) to a practical proposal dealing with a current topic.
4. Understand and be able to apply leading edge concepts and theory related to sustainability to research and practice.
5. Understand the role (potential role) of government, private sector and civil society in advancing sustainability.

**ENSC 390 Sustainability Units: 3.00**

The concept of sustainability provides a focus for discussing global and regional environmental issues in the broadest possible perspective. This course will examine the meaning of sustainability and ways in which it is assessed at various levels including individual lifestyles, ecological, agricultural and industrial systems, urban areas, regions within countries, nations, and the world as a whole. Case studies will be used to illustrate the general principles.

**Requirements:** Prerequisite Level 3 or above. Exclusion ENSC 230; ENSC 330.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 407 Global Water Resources: Challenges and Opportunities Units: 3.00**

This course investigates water resources from the physical, social, and health aspects common to a diversity of watersheds found across Canada, and around the world. It critically explores a wide range of challenges and opportunities associated with our common connection to water, from water as a human right, to anthropogenic environmental impacts.

NOTE Field Trip: estimated cost \$30.

**Learning Hours:** 128 (12 Lecture, 24 Seminar, 8 Off-Campus Activity, 84 Private Study)

**Requirements:** Prerequisite Level 3 or above.

**Offering Faculty:** Faculty of Arts and Science

**Course Learning Outcomes:**

1. Describe water resources and identify main watersheds processes.
2. Identify challenges and opportunities related to water resources around the world.
3. Interpret the movement of water within a watershed and the implications for water quality, quantity, and human health.
4. Apply geospatial analysis and advanced visualization techniques to better evaluate water resources.



### **ENSC 425 Ecotoxicology Units: 3.00**

An exploration of the interactions among chemical exposure, toxicity to individual organisms, and effects on ecosystem structure and function. Mechanisms of toxicity will be linked to effects at different levels of organization up to the level of the ecosystem, using case studies to explore the complexities of exposure and response.

NOTE Field Trip (Local Harbour or Marina): estimated cost \$30.

**Learning Hours:** 126 (24 Lecture, 12 Tutorial, 6 Off-Campus Activity, 84 Private Study)

**Requirements:** Prerequisite Level 4 or above and BIOL 102/3.0 and BIOL 103/3.0 and CHEM 112/6.0. Recommended ENSC 201/3.0.

**Course Equivalencies:** ENSC325; ENSC 425

**Offering Faculty:** Faculty of Arts and Science

#### **Course Learning Outcomes:**

1. Appreciate the history of chemical contamination in Kingston, Ontario.
2. Compare effects of pollutants at different levels of biological organization.
3. Describe the major classes of pollutants and their fate in the environment.
4. Search, synthesize, critique, and discuss scientific papers.
5. Solve problems and draw conclusions from ecotoxicological data.

### **ENSC 430 Honours Projects in Environmental Sustainability Units: 6.00**

Interdisciplinary study of the scientific, socio-political, and economic aspects of selected local, national, or global issues related to environmental sustainability. Teamwork is emphasized.

NOTE Field Trip (Biosphere Reserve): estimated cost \$30.

**Requirements:** Prerequisite (Level 4 or above and registration in an ENSC Major, ENVS Major, ENVS Joint Honours, EBIO, ECHM, EGEO, EGPY, ELSC, or ETOX Specialization Plan) or permission of the School.

**Offering Faculty:** Faculty of Arts and Science

#### **Course Learning Outcomes:**

1. Write literature reviews and project proposals.
2. Apply their knowledge of environmental studies to real-world issues.
3. Communicate their knowledge and ideas to different audiences and stakeholders.
4. Work effectively and collegially in an interdisciplinary team.

### **ENSC 445 Waste Flows: Environmental Studies of Waste Units: 3.00**

This course will consider waste as a global human health and environmental crisis that requires interdisciplinary approaches to understand waste as a social justice issue. Various types of waste will be considered as well as various waste governance and management practices.

NOTE Field Trip: estimated cost \$30.

**Learning Hours:** 132 (24 Lecture, 12 Tutorial, 24 Online Activity, 12 Off-Campus Activity, 60 Private Study)

**Requirements:** Prerequisite (Level 3 or above and registration in an ENSC Major, ENVS Major, ENVS Joint Honours, EBIO, ECHM, EGEO, EGPY, ELSC, or ETOX Plan) or permission of the School. Exclusion ENSC 483/3.0\* (Topic Title: Waste - Fall 2019, Fall 2020, Fall 2021, Winter 2024).

**Offering Faculty:** Faculty of Arts and Science

#### **Course Learning Outcomes:**

1. Understand and be able to communicate through writing and oral presentation how waste is a Canadian and global social justice issue, involving inclusion, diversity, equity and Indigenous sovereignty issues.
2. Critically assess the role and importance of the relations between material and social processes using the three central concepts of Social Justice, Upstream-downstream, and Inverted Quarantine.
3. Critically assess differing theoretical and methodological approaches that might be deployed to understand the role of waste in social justice issues involving environmental, social, political, economic, and cultural interactions, and critically examine proposed solutions.
4. Apply enhanced research methods and independent critical thinking to the multidisciplinary topic of waste.
5. Apply effective communication skills through oral presentation and writing abilities directed to an audience of diverse stakeholders.



**ENSC 480 Special Topics in Environmental Science Units: 3.00**

This course will provide intensive coverage of a topic that is current and/or of special interest in Environmental Science. The course will be multidisciplinary, but with a science focus. Offered periodically by visiting professors or members of faculty. The topic for each year will be announced in advance of course selection and will be made available on the ENSC web page. Students are advised to consult with their academic counsellor and/or the course instructor prior to registration.

NOTE Field Trip (Local Farm or Nature Reserve): estimated cost \$30.

NOTE This course is repeatable for credit under different topic titles.

**Requirements:** Prerequisite (Level 3 or above and registration in an ENSC Major, ENVS Major, ENVS Joint Honours, EBIO, ECHM, EGEO, EGPY, ELSC, or ETOX Specialization Plan) or permission of the School.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 482 Special Topics in Environmental Studies Units: 3.00**

This course will provide intensive coverage of a topic that is current and/or of special interest in Environmental Studies. The course will cover mainly social science-based material, but will be multidisciplinary. Offered periodically by visiting professors or members of faculty. The topic for each year will be announced in advance of course selection and will be made available on the ENSC web page. Students are advised to consult with their academic counsellor and/or the course instructor prior to registration.

NOTE Field Trip (Local Waste Treatment Facility): estimated cost \$30.

NOTE This course is repeatable for credit under different topic titles.

**Requirements:** Prerequisite (Level 3 or above and registration in an ENSC Major, ENVS Major, ENVS Joint Honours, EBIO, ECHM, EGEO, EGPY, ELSC, or ETOX Specialization Plan) or permission of the School.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 501 Independent Environmental Study Units: 6.00**

Independent study of an environmental topic by individuals or inter-disciplinary groups.

NOTE This course is intended for a self-motivated student with an established record of undergraduate performance, i.e. cumulative GPA of approximately 3.0. It is the responsibility of the student to secure a supervisor prior to registering in the course.

**Learning Hours:** 228 (48 Individual Instruction, 180 Private Study)

**Requirements:** Prerequisite Open to students in the final year of an Honours Program in any discipline, and with permission of the Instructor of the course and of the Department of the student's Degree Plan.

**Course Equivalencies:** ENSC 501, ENSC 501B

**Offering Faculty:** Faculty of Arts and Science

**ENSC 502 Research Project Sustainability Units: 12.00**

This is an interdisciplinary research project related to environmental sustainability, with supervision and training in appropriate research methods by faculty members of the School of Environmental Studies. The course includes supervised research including a research proposal, a seminar, a poster presentation and a final thesis and oral defence.

**Requirements:** Prerequisite Open to students in the final year of an Honours Program in any discipline, and with permission of the Instructor of the course and of the Department of the student's Degree Plan.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 594 Independent Study Units: 3.00**

Exceptionally qualified students entering their third- or fourth-year may take a program of independent study provided it has been approved by the Department or Departments principally involved. The Department may approve an independent study program without permitting it to be counted toward a concentration in that Department. It is, consequently, the responsibility of students taking such programs to ensure that the concentration requirements for their degree will be met.

NOTE Requests for such a program must be received one month before the start of the first term in which the student intends to undertake the program.

**Requirements:** Prerequisite Permission of the Department or Departments principally involved.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 595 Independent Study Units: 6.00**

Exceptionally qualified students entering their third- or fourth-year may take a program of independent study provided it has been approved by the Department or Departments principally involved. The Department may approve an independent study program without permitting it to be counted toward a concentration in that Department. It is, consequently, the responsibility of students taking such programs to ensure that the concentration requirements for their degree will be met.

NOTE Requests for such a program must be received one month before the start of the first term in which the student intends to undertake the program.

**Requirements:** Prerequisite Permission of the Department or Departments principally involved.

**Offering Faculty:** Faculty of Arts and Science

**ENSC 596 Independent Study Units: 12.00**

Exceptionally qualified students entering their third- or fourth-year may take a program of independent study provided it has been approved by the Department or Departments principally involved. The Department may approve an independent study program without permitting it to be counted toward a concentration in that Department. It is, consequently, the responsibility of students taking such programs to ensure that the concentration requirements for their degree will be met.

NOTE Requests for such a program must be received one month before the start of the first term in which the student intends to undertake the program.

**Requirements:** Prerequisite Permission of the Department or Departments principally involved.

**Offering Faculty:** Faculty of Arts and Science