

ENVIRONMENTAL STUDIES

Departmental Notes

Subject Code: **ENSC**

World Wide Web Address: <http://www.queensu.ca/ensc/>

Director: Ryan Danby (ryan.danby@queensu.ca)

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Departmental Telephone: 613-533-6602

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Chair of Undergraduate Studies: Stephen Brown
(stephen.brown@chem.queensu.ca)

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Undergraduate Office Telephone: 613-533-2655

Chair of Graduate Studies: Allison Goebel
(goebela@queensu.ca)

Overview

In the School of Environmental Studies, you will acquire an appreciation of the scope and complexity of environmental systems, the ability to deal with the socio-economic dimensions of an issue, and the fundamental knowledge to adapt to changes in the future. Students will study environmental systems from both the perspective of the natural and physical sciences, while recognizing the human and cultural dimensions of the issues.

Advice to Students

Counsellors

| Department | Counsellor |
|--|--|
| Environmental Studies | R. Stephen Brown, Biosciences Complex, Room 3130, 613-533-2655 |
| Department of Biology | R. Stephen Brown, Biosciences Complex, Room 3130, 613-533-2655 |
| Department of Chemistry | R. Stephen Brown, Biosciences Complex, Room 3130, 613-533-2655 |
| Department of Geography | Ryan Danby, Biosciences Complex, Room 3244, 613-533-6000 ext 77105 |
| Department of Geological Sciences and Geological Engineering | Heather Jamieson, Biosciences Complex, Room 3131, 613-533-6181 |

Life Sciences

Louise Winn, Biosciences
Complex, Room 3127,
613-533-6465

Environmental Studies Plans

The School of Environmental Studies offers Plans in both the Arts and Sciences. The following outlines describe each Plan:

Major (Arts) (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-major-arts-ba-honours/>) **Plan in Environmental Studies**

This Plan will prepare arts students to engage in and address environmental issues that are pressing and complex, require scientific expertise, socio-political understanding, the linking of global and local processes, and individual and institutional responsibility.

General (Arts) (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-general-arts-ba/>)/**Minor (Arts)** (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-minor-arts/>) **Plan in Environmental Studies**

This Plan provides an introduction and overview of environmental studies.

Joint Honours (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-medial-arts-ba-honours/>) **(Arts)** (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-medial-arts-ba-honours/>) **Plan in Environmental Studies**

This Plan provides disciplinary strength in the humanities and social science plus interdisciplinary environmental courses on the science side. Students will acquire a basic science background, an understanding of the complexity of environmental issues and their solutions.

Major (Science) (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-major-science-bs-honours/>) **Plan in Environmental Science**

This Plan provides a multidisciplinary view of environmental science with an emphasis on sustainability, and ecosystem and human health. The Plan includes core courses in



science, integrative courses in science and social science, and environmental courses in the humanities.

Specialization (Science) Plans

These Plans provides a multidisciplinary view of environmental science as well as in-depth study in one of six science subjects: Earth System Science (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/earth-system-science-specialization-science-bs-honours/>), Biology (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-biology-specialization-science-bs-honours/>), Chemistry (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-chemistry-specialization-science-bs-honours/>), Geology (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-geology-specialization-science-bs-honours/>), Life Sciences (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-life-science-specialization-science-bs-honours/>), or Toxicology (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-toxicology-specialization-science-bs-honours/>). A strong link is made to environmental studies, stressing human response to environmental issues and to questions of environmental policy and management.

Faculty

- Kristan J. Aronson (<https://qcri.queensu.ca/faculty-staff/kristan-aronson/>)
- R. Stephen Brown (<https://www.queensu.ca/ensc/facultyresearch/stephen-brown/>)
- Heather Castleden (<http://www.queensu.ca/geographyandplanning/people/faculty/heather-castleden/>)
- Dongmei Chen (<https://www.queensu.ca/geographyandplanning/people/faculty/dongmei-chen/>)
- Brian Cumming (<https://www.queensu.ca/ensc/brian-cumming/>)
- Ryan Danby (<https://www.queensu.ca/ensc/ryan-danby/>)
- Vicki Friesen (<https://biology.queensu.ca/people/department/professors/vicki-friesen/>)
- Allison Goebel (<https://www.queensu.ca/ensc/people/faculty-and-staff/allison-goebel/>)
- Anna Harrison (<https://www.get.omp.eu/author/anna-harrison/>)
- Myra Hird (<https://www.myrahird.com/>)

- Peter Hodson (<https://www.queensu.ca/ensc/peter-hodson/>)
- Alice Hovorka (<http://livesofanimals.info.yorku.ca/>)
- Heather Jamieson (<https://www.queensu.ca/ensc/heather-jamieson/>)
- Stephen Loughheed (<http://post.queensu.ca/~lough/>)
- Warren Mabee (<http://www.queensu.ca/geographyandplanning/people/faculty/warren-mabee/>)
- Thomas E. Massey (http://dbms.queensu.ca/faculty/thomas_massey/)
- David A. McDonald (<http://www.queensu.ca/devs/david-mcdonald/>)
- Diane Orihel (<https://www.queensu.ca/ensc/diane-orihel/>)
- Mick Smith (<https://www.queensu.ca/ensc/mick-smith/>)
- John P. Smol (<http://post.queensu.ca/~smolj/dper/dperjps.html>)
- Marcus Taylor (<http://www.queensu.ca/devs/faculty-profiles/marcus-taylor/>)
- Kyla Tienhaara (<https://www.queensu.ca/ensc/kyla-tienhaara/>)
- Rena Upitis (<http://educ.queensu.ca/rena-upitis/>)
- Leela Viswanathan (<https://ca.linkedin.com/in/leela-viswanathan-phd-rpp-mcip-5bb41b20/>)
- Nicholas Vlachopoulos (<https://www.rmcc-cmrc.ca/en/civil-engineering/nicholas-vlachopoulos-associate-professor/>)
- Virginia Walke (<http://biology.queensu.ca/people/department/professors/walker/>)
- Molly Wallace (<http://www.queensu.ca/english/m-wallace/>)
- Yuxiang Wang (<http://biology.queensu.ca/people/department/professors/wang/>)
- J. Webster
- Graham Whitelaw (<https://www.queensu.ca/ensc/facultyresearch/graham-whitelaw/>)
- Louise Winn (<https://www.queensu.ca/ensc/people/faculty-and-staff/louise-winn/>)
- Barbara Zeeb (<http://www.rmcc-cmrc.ca/en/chemistry-and-chemical-engineering/barbara-zeeb-professor/>)
- Frank Zeman (<https://www.rmcc-cmrc.ca/en/chemistry-and-chemical-engineering/frank-s-zeman-assistant-professor/>)

Specializations

- Earth System Science – Specialization (Science) – Bachelor of Science (Honours) (<https://queensu-ca-public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/earth-system-science-specialization-science-bs-honours/>)
- Environmental Biology – Specialization (Science) – Bachelor of Science (Honours) (<https://queensu-ca->

public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-biology-specialization-science-bs-honours/)

- Environmental Chemistry – Specialization (Science) – Bachelor of Science (Honours) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-chemistry-specialization-science-bs-honours/>)
- Environmental Geology – Specialization (Science) – Bachelor of Science (Honours) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-geology-specialization-science-bs-honours/>)
- Environmental Life Science – Specialization (Science) – Bachelor of Science (Honours) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-life-science-specialization-science-bs-honours/>)
- Environmental Toxicology – Specialization (Science) – Bachelor of Science (Honours) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-toxicology-specialization-science-bs-honours/>)

Majors

- Environmental Science – Major (Science) – Bachelor of Science (Honours) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-science-major-science-bs-honours/>)
- Environmental Studies – Major (Arts) – Bachelor of Arts (Honours) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-major-arts-ba-honours/>)

Joint Honours

- Environmental Studies – Joint Honours (Arts) – Bachelor of Arts (Honours) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-medial-arts-ba-honours/>)

Generals/Minors

- Environmental Studies – General (Arts) – Bachelor of Arts (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-general-arts-ba/>)
- Environmental Studies – Minor (Arts) (<https://public.courseleaf.com/arts-science/schools-departments-programs/environmental-studies/environmental-studies-minor-arts/>)

Courses

ENSC 2HUM Unspecified - 200 Level Units: 3.00

Offering Faculty: Faculty of Arts and Science

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 (24L;12T;24O;60P)

EQUIVALENCY ENSC 203/3.0.

Requirements: Exclusion No more than 3.0 units from ENSC103; ENSC203

Course Equivalencies: ENSC103; ENSC203

Offering Faculty: Faculty of Arts and Science

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.

(24L;12T;84P)

Requirements: Prerequisite Level 2 or above or permission of the School. Exclusion HIST 257.

Offering Faculty: Faculty of Arts and Science

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 (24L;12T;84P)

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

Offering Faculty: Faculty of Arts and Science

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 (24L;12T;36O;48P).

Requirements: Prerequisite ENSC 103. Exclusion ENSC 390.

Offering Faculty: Faculty of Arts and Science

ENSC 240 Intro To Ecological Econ Units: 3.00

Offering Faculty: Faculty of Arts and Science



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 (36L;84P).

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 (12L;24G;78P).

Requirements: Prerequisite Level 3 or above.

Course Equivalencies: ENSC301, ENSC401

Offering Faculty: Faculty of Arts and Science

ENSC 305 Social Environments Units: 3.00

This course critically examines the complex interaction of material and social processes that define our relationship with the environment. Topics focus on how environmental issues emerge as concerns, are defined by different stakeholders, and their solutions framed through political, economic, cultural, and techno-scientific discourses.

LEARNING HOURS 96 (24L;12G;60P).

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

Offering Faculty: Faculty of Arts and Science

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).

NOTE Field trip: estimated cost \$35.

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

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 (24L;12T;36O;60P).

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

Offering Faculty: Faculty of Arts and Science

ENSC 311 Applied Environmental Policy Units: 3.00

This course investigates the ecological, social and economic dimensions of environmental policy using a comparative approach. This course will normally be offered at an international locations (e.g. BISC) thereby allowing and comparisons/contrasts between Canadian and other context-specific approaches on the role of law, governance, politics, administration and economics towards promotion of 'enlightened' environmental policy.

NOTE Only offered in the Queen's-Blyth International Studies program or at the Bader International Studies Centre, Herstmonceux.

LEARNING HOURS 120 (24L;72G;24P).

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

Offering Faculty: Faculty of Arts and Science

ENSC 315 Global Food Security, Agriculture, and Environment Units: 3.00

National and global review of current and projected adequacy of food supplies, as affected by soil and water resources, climate and climate change, and human population growth. Reviews different scenarios for meeting food needs over the next 50 years, including technological, social, economic, and political factors.

LEARNING HOURS 124 (36L;4Pc;6O;18Oc;60P).

Requirements: Prerequisite Level 3 or above.

Offering Faculty: Faculty of Arts and Science

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.

Offering Faculty: Faculty of Arts and Science

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 (18L;18S;6O;108P).

Requirements: Prerequisite Level 3 or above.

Offering Faculty: Faculty of Arts and Science

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 (24L;12T;12G;36O;12Oc;36P).

Requirements: Prerequisite ENSC 230. Exclusion ENSC 390.

Offering Faculty: Faculty of Arts and Science

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 391 Practical Applications in Sustainability Units: 3.00

Application of approaches and practices of sustainability will be developed with an emphasis on individual or group projects. This course will involve sustainability efforts at a local, regional or national scale.

NOTE Only offered in the Queen's-Blyth International Studies program or at the Bader International Studies Centre, Herstmonceux.

LEARNING HOURS 120 (24L;72G;24P)

Requirements: Prerequisite Level 3 or above.

Offering Faculty: Faculty of Arts and Science

ENSC 401 Ecological Assessment Units: 3.00

Requirements: Requires a minimum of 48.00 units

Course Equivalencies: ENSC301, ENSC401

Offering Faculty: Faculty of Arts and Science

ENSC 407 Global Water Issues Units: 3.00

Increasing demands on water resources and widespread pollution of surface and groundwater has led many experts to predict a looming water crisis. This course will develop a global perspective on issues that include water distribution, management, pollution, conservation, conflict and policy. This course will be of interest to students in science, applied science or the humanities.

NOTE Field Trip: estimated cost \$30.

Requirements: Prerequisite Level 3 or above.

Offering Faculty: Faculty of Arts and Science

ENSC 410 Hons Proj In Environ Sustain Units: 3.00

Offering Faculty: Faculty of Arts and Science

ENSC 420 Gender and Environments Units: 3.00

This course considers feminist approaches to environmental issues in western and non-western contexts, with attention to both theories and activism.

Requirements: Prerequisite Level 3 or above. Note This course is recommended for students in Environmental Studies, Gender Studies, Global Development Studies or Health Studies.

Offering Faculty: Faculty of Arts and Science

**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: estimated cost \$20.

LEARNING HOURS 126 (24L;12T;6Oc;84P).

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

Course Equivalencies: ENSC325; ENSC 425

Offering Faculty: Faculty of Arts and Science

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: estimated cost \$30.

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

Offering Faculty: Faculty of Arts and Science

ENSC 471 Environmental Analysis Methods Units: 3.00

Two weeks of intensive study in Environmental Analysis. Fundamentals of sample collection and preparation, including statistics and extraction methods, plus instrumental techniques including chromatography, atomic spectroscopy, spectrophotometry, and automated analysis techniques. Laboratory experiments in each of these areas. Enrolment limited.

NOTE Field trip: estimated cost \$15.

Requirements: Prerequisite CHEM 213 or permission of the School. Exclusion CHEM 321.

Course Equivalencies: ENSC371, ENSC471

Offering Faculty: Faculty of Arts and Science

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: estimated cost \$30.

Requirements: Prerequisite Level 3 or above and registration in an (ENSC Major, ENVs Major, ENVs Medial, EBIO, ECHM, EGEO, EGPY, ELSC or ETOX 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: estimated cost \$30.

Requirements: Prerequisite Level 3 or above and registration in an (ENSC Major, ENVs Major, ENVs Medial, EBIO, ECHM, EGEO, EGPY, ELSC or ETOX plan) or permission of the School.

Offering Faculty: Faculty of Arts and Science

ENSC 483 Special Topics in Environmental Studies II 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. Topic for each year will be announced in advance of course selection and will be made available on the ENSC webpage. Students are advised to consult with their academic counsellor and/or the course instructor prior to registration.

NOTE Field Trip: estimated cost \$30.

Requirements: Prerequisite Level 3 or above and registration in an (ENSC Major, ENVs Major, ENVs Medial, EBIO, ECHM, EGEO, EGPY, ELSC or ETOX 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 (48I;180P).

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

Offering Faculty: Faculty of Arts and Science

ENSC 595 Independent Study Units: 6.00

Offering Faculty: Faculty of Arts and Science

ENSC 596 Independent Study Units: 12.00

Offering Faculty: Faculty of Arts and Science