



Faculty of Science Course Syllabus
Department of Economics
Econ3335.03: Environmental Economics
Fall, 2026

Dalhousie University operates in the unceded territories of the Mi'kmaw, Wolastoqey, and Peskotomuhkati Peoples. These sovereign nations hold inherent rights as the original peoples of these lands, and we each carry collective obligations under the Peace and Friendship Treaties. Section 35 of the Constitution Act, 1982, recognizes and affirms Aboriginal and Treaty rights in Canada. We recognize that African Nova Scotians are a distinct people whose histories, legacies, and contributions have enriched the part of Mi'kma'ki known as Nova Scotia for over 400 years.

Instructor: Ruth Forsdyke, Ruth.Forsdyke@Dal.ca,

Lectures: Tues, Thurs 1:05 pm - 2:25 pm, LSC Common Area, rm C244

Office Hours (Prof.): Friday 10:30 am - 12:20 pm (in person room C12 Maxwell House)
 or by appointment (in person or Teams).

Teaching Assistant: None

Office Hours (TA): None

Course Delivery: In person, lectures not recorded

* If you are unable to make the office hour times, please email the professor for appointment.

1_ Course Description (Calendar)

This course serves as an introduction to environmental economics. Topics include social decision-making, externalities and public goods, regulatory approaches (standards, charges, tradable permits), forms of value derived from the environment and measurement techniques.

2_ Course Prerequisites

ECON 2200.03 or 2220.03 with minimum grade of C.

3_ Course Description (Longer)

Although our industrial fossil fuel-powered economy has greatly increased the material affluence of much of humankind, this has been and continues to be at great cost to our natural environment. Current problems include: atmospheric greenhouse gases (GHGs) causing global warming, climate change, and ocean acidification; ozone layer depletion; health and ecosystem damaging air and water pollutants including persistent toxins, radiation, and micro-plastics; and the destruction of natural ecosystems with massive rates of biodiversity loss including species extinctions, and overpopulation. These problems greatly compromise the health of the biosphere which provides life support for the humans and other animals.

Directing our economies towards sustainability such that they “meet the needs of the present generations while not compromising those of the future” (Brundtland Report, 1987) poses a great and urgent challenge in a world in which there are many other urgent problems such as wars, genocides, endemic undernourishment and famines, and deaths due to treatable and uncured diseases.

Part I considers environmental problems as social problems with social solutions which work by changing private incentives so that people take into account “external costs” the costs of their decisions upon other “third” parties. We illustrate using an example of network externalities in city transport systems.

Part II investigates sustainable economic systems including a case study of the collapsed civilization of Easter Island, Malthus’s theory of population, carrying capacity and ecological footprints, “limits to growth”, and circular vs. linear production systems.

Part III investigates Pigou’s framework, which illustrates that markets fail to be efficient when there are negative externalities but can be theoretically corrected with policies. The collapse of the East Coast cod fishery is explained as an “open access problem” and positive externalities are examined in the context of pollinators (ex. bees) and are related to public good provision problems. The marginal abatement cost/ marginal damage (MAC-MD) analytical framework is then developed.

Part IV investigates how environmental damages and abatement costs are measured and used in social cost benefit analysis.

Part V looks at environmental policy. First we consider decentralized solutions (property rights, liability approaches, and green goods) and show these are insufficient such that centralized government policies are required. The latter include pollution taxes, emissions and technology standards, cap and trade, and educational/moral suasion policies. Policies are then compared.

Part VI investigates global environmental problems which require global policy cooperation, for example to prevent business from relocating in “pollution havens” (countries or regions with lax environmental policies). We consider global environmental agreements and ways to alter trade agreements to protect the environment.

4_ Course Objectives/Learning Outcomes

- Explain externalities as a social cause of environmental problems and illustrate with examples.
- Use mathematical and graphical models to illustrate how markets fail to protect the environment and how environmental policy works. Be able to explain the graphs using language.
- Explain reasons for limits to growth and implications for economies.
- Explain the environmental quality – consumption benefit trade-off utilized by environmental economists and its limitations.
- Practice solving problems using microeconomics.
- Identify and critically think about various “welfare criteria” used to judge environmental policies including positive-normative criteria, utilitarianism, and consequentialism vs. not.
- Explain methods of monetizing environmental damages and abatement costs, how these are aggregated in cost benefit and cost-effective analysis and pros and cons of these methods.

- Use MAC-MD framework to determine socially efficient prices and levels of pollutants and compare environmental policies using a variety of criteria.
- Learn about a variety of environmental problems and appreciate their seriousness and urgency.
- Understand that humans depend on healthy ecosystems to have a life support system and that these are seriously compromised by current production systems and consumption practices.
- Improve skills in critical thinking and gain genuine confidence in your ability to learn on your own.
- Appreciate your own environmental impact and learn ways to reduce it.
- Relate ideas learned in this course to a particular environmental topic that interests you and communicate this orally and via a short magazine article.
- Practice working in groups.

5_ Course Materials

Required Textbook:

Field, B.C. & Field M.K. (2024) *Environmental Economics: An Introduction* McGraw-Hill Education, 2024 Release

e-book is available via the Dalhousie Bookstore link:

[https://bookstore.dal.ca/CourseSearch/?course\[\]=SUB,202710,ECON,ECON3335,01&](https://bookstore.dal.ca/CourseSearch/?course[]=SUB,202710,ECON,ECON3335,01&)

OR

Olewiler, N. & Field, B. (2015) *Environmental Economics: 4th Canadian Edition*, McGraw – Hill Ryerson, Toronto (2nd, 3rd or 4th ed)

* As the Canadian edition is no longer available, the American edition (F&F) will be used. Either edition is fine for this course and readings are provided for both.

- Other course materials available on *Brightspace* include slides, videos, notes for some topics, and links to internet media.

Library Reserves:

Some supplementary material may be placed on reserve in the library.

6_ Course Assessment

Component		Weight (% final grade)	Basic Details	Submission details	Due Date
Midterm		20		in class	Oct 15
Final Exam		40		Scheduled by Registrar	TBA
Assignments		12	Best 2 out of 3 (2 before midterm, 1 after)	Brightspace "Assessments" >> "Assignments"	2 before midterm, 1 after
Environmental News Broadcast with Magazine Article on a particular environmental topic (group work)	News Broadcast	10	- either live "in person" using props such as lap tops and/or posters OR pre-produce a video and show it. - 5 minute questions session.	If you did a video, please submit to Brightspace "Assessments" >> "Assignments" and "Discussions" News Broadcasts and Magazine Article Portal.	Nov 24th (and Nov 26th if needed)

	Magazine Article	6	- write short magazine article on your news broadcast & illustrate using figures.	Brightspace "Assessments">>"Assignments" and "Discussions".	Nov. 26
	Reflection & Assessment	4	- of self, other groups', members of own group.	- form to be handed out - submit to Brightspace "Assessments">>"Assignments"	Dec 3
Participation & Attendance		8	- based on attendance, participation & engagement.		

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

A+ (90-100)	B+ (77-79)	C+ (65-69)	D (50-54)
A (85-89)	B (73-76)	C (60-64)	F (<50)
A- (80-84)	B- (70-72)	C- (55-59)	

7_ Details on Course Work and Assessment

Lectures and Questions:

Please ask questions during class, or/ and on the discussion board, and during office hours. If of general interest to the class, I recommend asking during class or on the Brightspace Discussion board. However, please visit office hours or **email** your questions to the professor if its private or not likely to be of general interest to the class. If your question is too time consuming to answer by email, please come to office hours.

Lecture Slides/ Covid Videos:

The lecture slides will be posted after class. For some lectures, videos produced during the Covid lockdown, the "covid videos" will be posted. Although these may be helpful if you missed a class due to illness, or to review material previously covered in class, they should be regarded as **highly imperfect substitutes for real in-class lectures and may differ in coverage or emphasis**. Also, information in the videos regarding dates (ex. assignment due dates, test dates) or statements like "next week we will cover" should be disregarded as they applied to the time period of the Covid Lockdowns.

Midterm and Final Exam: The midterm is held in class (see date in schedule) and the final exam is scheduled by the Registrar and both are on campus.

Assignments: These are **individual** which **must be written in your own words** in handwriting with hand drawn graphs. Please do these yourself using your own brain requiring you to think, put ideas together in a logical manner in writing, and learn to plot and interpret graphs., and solve the problem. Otherwise, you are missing out on practicing critically thinking so as to truly understand this important material. Try your best to solve the problem yourself as this is how you learn. Doing the problems using AI or and copying off other students will not help you to learn skills of analysis, thinking, writing, and graph plotting. Assignments will be graded based on a combination of : 1) completion, and 2) some selected questions and components of questions. If no TA is available for this class, a larger component of the grade will be based on completion.

Environmental News Broadcast & Magazine Article (on a particular environmental topic):

Here you will **pretend you are an Environmental Economics news reporter investigating a particular environmental problem**. You will work in groups of **2 to 3 students**. You will assume your audience understands basic economic concepts (ex. took principles economic class), so you will be able to use basic demand and supply graphs to try to understand and explain the particular environmental problem you're researching. Learning objectives include learning about a particular environmental issue and relating it to theory regarding the source of the problem, and using these to discuss policy solutions, pros and cons, and actual policy approaches. The challenge will be to explain concepts of environmental economics (learned in a course) applied to a particular context in a manner that a generally educated person could understand. The project has three components as follows:

1) News Broadcast

Here, you take on the role of Broadcasters to produce a news show using one of the following two methods:

- 1) 7 - 10 minutes live using props such as laptops and/or posters OR
- 2) a 7 - 10 minute pre-prepared video and show it.

Either approach will be followed by a 5- minute question session with questions being asked by other students, the professor and TA (if applicable).

2) Magazine Article

- write a short magazine article on your news broadcast including illustrative figures such as graphs, photos, and diagrams. This will be posted in the News Broadcast Forum under Brightspace Discussions.

- Page Limit = 2 pages including figures, word count = 600 to 800 words, body text is 12 font.

3) Reflect and Assess self, other groups', other group members, & participation

Based on Attendance, engagement, participation in class exercises & games, and reflections. A paper form will be circulated on the News Broadcast day!

Participation: Based on attendance, engagement, participation in class exercises & games, including writing answers to short questions, and reflecting on course content on small pieces of paper and submitting these.

Practice Problem Sets: These are for practice and are NOT submitted for grades. **Answers** will be posted so you can check your answers or peek at the solutions if you get stuck in order to help you to see how to proceed. However, do your best to try the problem on your own before peaking at the answers as you will likely learn more! You may also want to solve these in groups as this will allow you to practice explaining things to others and listening to and trying to understand their answers.

Discussion Board: In Brightspace, click on "Discussions" to access Discussion forums such as "**Ask a Question**", and "**Environmental Economics in the News**". You are encouraged to ask questions, , comment, relate class content to real world events, or respond to posts made by the professor, TAs, or other students, and/or post interesting news items. You may either use your name or participate anonymously (meaning that other class members will not know who you are, but the professor and teaching assistants will know your name).

Office Hours: These are in person. If you are unable to make these hours and have a question, please email the professor or TAs to set up an appointment either in person or via Teams. Dependent upon Covid conditions, office hours may be moved entirely online via Teams.

8_ Course Schedule & Topics (tentative as time permits)

Readings either F&F or O&F (for details, see required textbook above)

- **F&F** refers to **Field and Field (2024) (paper or e-book)**

- **O&F** refers to **Olewiler & Field, (Canadian Ed.)**

- “*” = highly recommended background reading, “no *” = supplementary background reading such as papers referred to in slides. Background readings will help you to place lecture material into a broader context. Focus on material covered in slides.

	Lecture Topic	Readings
Part I: Introductory		
	L1) Introduction: What is Environmental Economics? Why is it important? How will we study it. - Types of Problems, Social Source of the Problem, Externalities,	* F&F, ch. 1, ch.2 or * O&F, ch. 1 (4th ed. pg. 1-16, 27-38) (3 rd ed. pg. 1-15, 25-35) - Harden, Garrett (1960) The Tragedy of the Commons
	L2) Environmental Problems as Social Problems (Network externalities in city transport)	* online note * F&F or O&F, Ch. 2, Fig. 2.1 (compare with Daly Diagram)
Part II: Sustainable Economic Systems		
	L3) Limits to Growth & Collapse, Linear vs. Circular Economies, & Misperceptions (Case Study Easter Island)	* Diamond, Jared (1995) Easter’s End , <i>Discover Magazine</i> http://discovermagazine.com/1995/aug/eastersend543 - Diamond, Jared (2005) Collapse: How Societies Choose to Fail or Succeed, Ch. 2 “Twilight at Easter” - Brander, James and Taylor, S.M. (Mar. 1998) The Simple Economics of Easter Island: A Ricardo-Malthus Model of Renewable Resource Use, <i>American Economic Review</i> , 88(1), pg 119 – 138 (you do NOT need to know the math in this paper but may wish to read written sections). * F&F, ch. 2 (2.3 - 2.5) or O&F, Ch. 1, pg. 15-19, Ch. 2 * Annie Leonard, The Story of Stuff (Video, 20 min.) http://www.storyofstuff.com/ - Daly, Herman (1999) Uneconomic Growth in Theory and in Fact, <i>The First Annual Feasta Lecture</i> , Trinity College Dublin. http://www.feasta.org/documents/feastareview/daly.htm - Boulding, Kenneth (1966) The Economics of Coming Space Ship Earth, in Daly, Herman and Kenneth Townsend, <i>Valuing the Earth, Economics, Ecology, Ethics</i> , pg. 297-310. http://www.ub.edu/prometheus21/articulos/obsprometheus/BOULDING.pdf
	L4) Malthusian Dilemma, Steady States, Carrying Capacity, and Ecological Footprints	* Rees, William E. (2006), <i>Ecological Footprints and Bio-Capacity: Essential Elements in Sustainability Assessment</i> http://www.ecoglobe.ch/footprint/e/rees2006.htm - Malthus, Thomas (1778) <i>An Essay On the Principle of Population</i> https://www.econlib.org/library/Malthus/malPop.html - Arrow, Kenneth et. al. (1996) Economic Growth, Carrying Capacity and the Environment, <i>Ecological Applications</i> , 6(1), pg. 13-14.
Part III – Externalities, Key Concepts and Analytical Framework		
	L5) Private Efficiency and Markets	* F&F (ch. 3, ch. 4, pg. 60 - 65) or O&F 4th ed. (ch. 3 & ch. 4, pg. 57 - 61)

	L6) Negative Externalities and Market Failure (Social Efficiency) {Case study: Agriculture}	* F&F, ch. 4 or O&F, ch. 4 * Stavins, R. & Fullerton, D. (1998) How Economists see the Environment, <i>Nature</i>, 395, 433- 434. http://works.bepress.com/cgi/viewcontent.cgi?article=1019&context=don_fullerton - Pigou, A.C. (1952) <i>The Economics of Welfare</i>, Transaction Publishers, New Brunswick, New Jersey, http://books.google.com/books?id=bQUdTMh7uxQC&printsec=frontcover#v=onepage&q=&f=false - Balmford A., Green R., Phalen, B. (2012) What Conservationists Need to Know About Farming, <i>Proceedings of the Royal Society</i>, B, 279, pg. 2714-2724. - Pimenthal, David (2005) "Environmental and Economic Costs of the Application of Pesticides Primarily in the United States", <i>Environment, Development and Sustainability</i>, 7, 229-252 link to paper - Bourguet, D. & Guillemaud, T. (2016) The Hidden and External Costs of Pesticide Use, <i>Sustainable Agriculture Reviews</i>, 19. link to paper - Rachel Carson (1962) Silent Spring-1, <i>The New Yorker</i> https://www.newyorker.com/magazine/1962/06/16/silent-spring-part-1
	L7) Open Access Problems related to negative externalities (Case Study, Collapse of the East Coast Cod Fishery)	* F&F, Ch. 4, pg. 70-72 or O&F, ch. 4, pg. 65 - 67 * Harden, Garrett (1960) "Tragedy of Freedom on a Commons" http://dieoff.org/page95.htm {please read at least the first 5 paragraphs} * H. Scott Gordon (1954) pg. 88-99 A Common Property Resource: The Fishery, <i>The Journal of Political Economy</i>, 62 (2), pg. 124-142 http://faculty.arts.ubc.ca/gmunro/472gord.pdf
	L8) Public Goods, External Benefits, and Market Failure (Case Study, nature parks, bees and other insects)	* F&F, pg. 67-73 or O&F, pg. 68-73
	L9) MAC MD Framework (Case Study, Persistent Toxins)	* F&F or O&F, Ch. 5 ch. 11 (standards, pg. 194-201), Ch. 12 (taxes and subsidies, pg. 212-218) O&F, Ch. 5, ch. 11 (standards, pg. 203-212), ch. 12 (taxes and subsidies, pg. 225-231)
Part IV: Policy Analysis		
	L10) Criteria for Policy Analysis & Decentralized Policies I (Coasian Property Rights Solutions)	F&F or O&F (Ch. 9, Ch. 10) Bentham, Jeremy (1789) <i>The Principles of Morals and Legislation</i> (1789) Ch I, p. 1-5 http://books.google.ca/books?id=EfQJAAAAIAAJ&printsec=frontcover&dq=the+principles+of+morals+and+legislation&source=bl&ots=nByXL8ngMA&sig=bywMPtoXgaTnxUz-ReWfB2h3Abo&hl=en&ei=f34jTfLxFIH78Ab6-unsDQ&sa=X&oi=book_result&ct=result&resnum=3&ved=0CCgQ6AEwAg#v=onepage&q&f=false Happiness (and how to measure it), <i>The Economist</i>, (Dec. 19th, 2006) http://www.economist.com/node/8450035?story_id=8450035
	L11) – Decentralized Policies II (Liability Approaches, Green Goods and Moral Suasion)	F&F or O&F, Ch. 10 * Ronald H. Coase (1960) The Problem of Social Cost, <i>Journal of Law and Economics</i>, pg. 1-44 Movie clip, <i>A Civil Action</i>
	L12) Cap and Trade (US SO ₂ market) a) How it works. b) Monetary cost effectiveness c) Other centralized policy comparisons.	F&F or O&F, Ch. 13 F&F, ch. 11 (standards, 200-211), ch. 12 (taxes, 218-233), ch. 13 (cap & trade, 243-249) or O&F, ch. 11 (standards, 211-222), ch. 12 (taxes, 231-242), ch. 13 (cap & trade, 248-257)

	L13) Policy Comparisons Under Uncertainty	O&F, ch. 14 (will be posted) * Weitzman, M.L. (1974) Prices vs. Quantities, <i>Review of Economics Studies</i> , pg. 477 -491 http://scholar.harvard.edu/weitzman/files/prices_vs_quantities.pdf
Part V – Cross Boundary Pollution		
	L14) Environmental Problems as Prisoner's Dilemmas	F&F, Ch. 19, O&F, ch. 20 Barrett, Scott (Spring, 1990) The Problem of Global Environmental Protection, <i>Oxford Review of Economic Policy</i> , 6(1), pg. 68 - 79
	L15) Trade and the Environment	slides
Part VI: Measurement (as time permits)		
	L16) Measurement of Externalities and Abatement costs	F&F or O&F (ch. 6 - 8)

9_ How to Learn in this Course

- **attend all lectures (unless sick), pay attention, and take notes.** Taking notes may help you to pay attention aiding learning as you will need to try to understand the material in order to write it down concisely. Audio reinforcement may help you to learn. Going to class should help you to create a rhythm, and keep organized so you don't fall behind.
- read through course syllabus to get an overview of what lies ahead.
- manage your time -- make a schedule, record due dates in your planner, and set aside times to study.
- avoid distractions like social media while studying. Just turn it off!
- after logging into Brightspace, check **Announcements** for new information.
- do all assignments.
- read and work through the textbook readings for overview and to understand concepts in lecture slides. Use the lectures and slides to guide your focus. Slides and posted "Covid Videos" may help you to review points from the lectures and go over any points you had difficulty with during class and augment missing sections in your class notes. Charts, flow charts and mind maps may be helpful. Work through the mathematical problems and write down and/or talk through the method used. Make summaries to identify key points.
- if you need to miss a class, please ask other students and/or visit office hours to find out what you missed.
- do the practice problems on your own. If you get stuck, peak at the solution and then try on your own again. Repeat as necessary. Note down where you went wrong in your initial attempt.
- relate course concepts to other things you know.
- ask questions while studying, in office hours and on discussion boards.
- start studying early for tests. Do review sheet problems.
- explain concepts to yourself and other students. Test yourself.
- If you are having trouble focussing your study, please visit office hours for advice.

10_Course Policies

1) Students are responsible for **CHECKING THE FINAL EXAM SCHEDULE PRIOR to booking any flights.** There are **NO EARLY EXAMS** under **ANY circumstances.**

2) **Late or Missed Midterms or Assignments:** If you miss a midterm or assignment due to illness, death in the family, or for other serious valid reasons, as soon as possible, please inform the professor via email and include a signed **Student Declaration of Absence (DOA)** form. Be sure to read the form carefully. In the case of a **missed midterm**, the final

exam will be worth the combined grade percentage of the midterm and the final exam.

Student DOA forms are available at:

<https://cdn.dal.ca/content/dam/dalhousie/pdf/faculty/computerscience/forms/StudentDeclarationofAbsenceFORM.pdf/subassets/page1.pdf>

3) If the **final exam is missed due to illness**, or some other serious extenuating reason, please inform the professor by email as soon as possible to let them know and arrange to write an alternative exam.

4) **Late assignments** receive a **maximum penalty of 5% per day**.

5) **Class slides/videos** should be regarded as complements as opposed to substitutes for reading the textbook and attending lectures. When you read the textbook, with pencil and paper, work through the examples.

6) Students are responsible for **checking Brightspace "Announcements" regularly**.

Important information to guide learning including occasional corrections to assignments or test review questions are posted there.

7) You are responsible for establishing whether you have access to all course material as soon as the term begins and before the ADD/DROP date. If you cannot access certain material, inform the instructor as soon as possible. Alternative access methods are not guaranteed.

8) Students are expected to conduct themselves with **academic integrity** and should familiarize themselves with the University academic integrity policy. The link is here:

<https://www.dal.ca/about/leadership-governance/academic-integrity.html>

In particular, it's important to learn what **plagiarism**, as this is a **grave academic offence**. The link is here: <https://www.dal.ca/about/leadership-governance/academic-integrity/plagiarism-and-cheating.html>

If you have questions, please ask the professor.

9) **Gift Policy**: Please do NOT give either the professor or the teaching assistants gifts as this may be a conflict of interest. However, if you wish to thank us, a kind word is much appreciated.

10) **Laptop Policy**: Students are strongly discouraged from using laptops during class, although it's fine to use a tablet to take notes. **Phones are strictly prohibited in the classroom**.

11) **Course Accessibility**: Please refer to the **Student Accommodation Policy** for information on how Dalhousie instructors and staff work collaboratively with students to create and sustain an accessible educational environment.

- You are eligible for accommodations based on protected characteristics such as religion. If you have religious, cultural, or community-significant observances that conflict with course requirements, reach out to me to collaboratively find alternatives for completing the course requirements.
- To begin the process of requesting a formal academic accommodation, contact the Student Accessibility Centre

Syllabus Appendix

Click on the following link for important information on student supports & University Statements, Policies, and Guidelines.

[Syllabus Appendix: Student Supports & University Statements, Policies, and Guidelines](#)