



Faculty of Science Course Syllabus
Department of Economics
Econ3335.03: Environmental Economics
Fall 2016

Instructor: Ruth Forsdyke, Ruth.Forsdyke@Dal.ca, room C12, Maxwell House, (902) 494-6990

Lectures: M,W,F (10:35 to 11:25) LSC Common Area (room C244)

Office Hours (Prof.): Mon. & Wed. 3:40 – 4:40 (Drop in)

Tues. 2-4 pm, Doodle Poll sign up

Doodle url: <http://doodle.com/poll/zxnfe2csmvfekfa6>

Teaching Assistant: TBA

Office Hours TA: TBA

1_Course Description (Calendar)

CREDIT HOURS: 3

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.

NOTES: All Economics courses, unless stated otherwise, have a minimum grade requirement of C for their prerequisite courses.

2_Course Prerequisites

ECON 2200.03 or 2220.03

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 and radiation; and the destruction of natural ecosystems with massive rates of biodiversity loss including species extinctions. These problems greatly compromise the health of the biosphere and, through this the human economy.

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 but urgent challenge in a world in which there are many other urgent problems such as wars, endemic undernourishment, famines, deaths due to treatable diseases, and high rates of illiteracy.

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 standard Neoclassical approaches to environmental economics. This includes Pigou's framework, which illustrates that markets fail to be efficient when there are negative externalities but can be 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 analysis. First we consider decentralized solutions (property rights, liability approaches, and green goods) and show these are insufficient such that centralized government policies are required. These include pollution taxes, standards, cap and trade markets and educational/moral suasion policies. Policies are then compared according to various welfare criteria.

Lastly, we look at global environmental problems, which require global policy coordination, for example to prevent business from relocating in "pollution havens" (countries or regions with lax environmental policies). This includes a discussion of 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 give examples to illustrate.
- Use mathematical models to illustrate inefficiency due to externalities and how policies can be used to correct these inefficiencies.
- Explain the environmental quality – consumption benefit trade-off utilized by environmental economists.
- Practice using microeconomics to solve problems, which are similar to but not identical to lecture material.
- Explain limitations of various welfare criterion (ex. efficiency) used to evaluate environmental policies.
- Explain methods used to monetize environmental damages and abatement costs.
- Use MAC-MD framework to compare environmental policies under a variety of situations including uncertainty.
- Learn about a variety of environmental problems.
- Improve skills in critical thinking and genuine confidence in your own learning ability.
- Appreciate your own environmental impact and learn practical ways to reduce it.

"Education is a process of living, and not a preparation for future living" -- John Dewey.

"The human mind is our fundamental resource" John F. Kennedy

5_Course Materials

Required Textbook: Olewiler, N. & Field, B. (2011) *Environmental Economics: Third Canadian Edition*, McGraw – Hill Ryerson, Toronto.

* the second edition is a good substitute.

Library Reserves (supplementary material):

Daly, H.E. & Farley, J.C. (2011) *Ecological Economics: principles and applications*, Island Press, Washington.

Gore, Al (2005) *Earth in the Balance*, Rodale, USA.

Gore, Al (2007) *An Inconvenient Truth*, Rodale, USA.

Tietenberg, T.H. & Lewis (2006) *Environmental and Natural Resource Economics*: 7th ed.

Electronic Resources:

- Brightspace (slides, notes on specific topics, media, academic journal articles)

Discussion Forums on Brightspace:

1) **Question and Answer Forum:** (please ask questions or initiate discussions here). If another student asks a question and you know the answer, please help them out.

2) **Environment in the News:** The professor, TA and Students will post information on current events here. Students are encouraged to post links to newspaper, magazine articles and videos. Interesting academic journal articles can also be posted here.

6_Course Assessment

Component	Weight (% of final grade)	Date
Midterm	25 %	Oct. 19 th (7 - 8:30 pm, tentative)
Final exam	45 %	(Scheduled by Registrar)
Assignments	25 % (best 3 out of 4)	
Participation	5 %	

* Due to possible conflicts, midterm date is tentative and will be confirmed during week 2.

* SCP Project contains individual and group components (see details below).

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:

Practice Problems:

Practice problem sets are provided for practice and are NOT to be handed in. Answers to these are posted so that you can check your answers.

Assignments:

There are four hand-in assignments. Your assignment score is based on the best 3 out of 4 assignments. One of the best ways to learn is to teach and you will benefit from helping each other. Hence, you are encouraged to work in groups to solve the problems. However, *each student must hand in an individual assignment, which must be written in your own words to indicate that you understand what you are doing*. If you worked in a group, write down other group members name on the top right-hand side of assignment.

Participation:

The participation grade will be determined by a combination of attendance and engagement in the course.

8_Course Policies

In cases in which a student misses a midterm, final exam, or other assignment due to illness, a doctor's note must be provided. In this case, other assessment components will be given more weight. Doctor's notes must contain a clearly written doctor or nurse's name with a contact phone number and evidence that the student was ill.

Late assignments receive a maximum penalty of 5% per day, unless the student provides a doctor's note. Assignments will not be accepted after answers have been posted on the web.

Class slides are posted after lectures and are not a substitute for reading the textbook. Readings will be written on the chalkboard during class.

9_Course Content

(tentative as time permits)

- O&F refers to the textbook.
- "*" refers to recommended background reading
- please read non-starred readings prior to class.

Part I: Introductory	
1- Introduction: What is Environmental Economics?	O&F, ch. 1 (pg. 1-15), ch. 2 (pg. 25-35)
2- Environmental Problems as Social Problems (Network externalities in city transport)	Note will be provided online
Part II: Sustainable Economic Systems	
3- Collapse (Case Study of Easter Island)	Diamond, Jared (1995) Easter's End, <i>Discover Magazine</i> http://discovermagazine.com/1995/aug/eastersend543
4- Malthusian Dilemma, Carrying Capacity, Steady States, & Ecological Footprints	Rees, William E. (2006), Ecological Footprints and Bio-Capacity: Essential Elements in Sustainability Assessment http://www.ecoglobe.ch/footprint/e/rees2006.htm * Arrow, Kenneth et. al. (1996) Economic Growth, Carrying Capacity and the Environment, <i>Ecological Applications</i> , 6(1), pg. 13-14.
5- Limits to Growth and Linear vs. Circular Economic Systems	O&F, Ch. 1, pg. 15-19, Ch. 2 Annie Leonard, The Story of Stuff 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
Part III – Externalities, Key Concepts and Analytical Framework	
6- Private Efficiency and Markets	O&F, ch. 3 & ch. 4 (pg. 52 – 56)
7- Negative Externalities and Market Failure (Social Efficiency) {Case study: Agriculture}	O&F, ch. 4 (pg. 57 – 60) 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, (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.
8- Open Access Problems (Case Study, The Collapse of the East Coast Cod Fishery)	O&F, ch. 4, pg. 60 – 61 “ Tragedy of Freedom on a Commons” (http://dieoff.org/page95.htm) {please read 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) * Reed, W.J. (1991) Discussion: Bioeconomics. An Essay on the Classic Papers of H. Scott Gordon, Milner B. Schaeffer and Harold Hotelling, <i>Bulletin of Mathematical Biology</i> , 53(1/2), pg. 217-229. (http://www.springerlink.com/content/254r23683x643x48/)
9 – Positive Externalities and Market Failure (Case Study, Bees, Butterflies and Other Insects)	O&F, pg. 62 - 63
10 – Public Goods (Case Study, Nature Conservatories, Information)	O&F, pg. 63 - 67
11- MAC MD Framework (Case Study of Persistent Toxins) with introduction to emissions standards and emissions taxes.	O&F, ch. 5, ch. 11 (standards, pg. 180 – 185), (taxes, pg. 198 – 203)
Part IV – Social Cost Benefit & Cost Effectiveness Analysis	
11- Overview and key concepts	O&F, ch. 6
12- Valuation of Benefits	O&F, ch. 7
13- Valuation of Costs	O&F, ch. 8
Part V – Policy Analysis	
14 - Criteria for Evaluation of Environmental Policies	O&F, ch. 9 * 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&q=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
15 - Decentralized Policies I (Coasian Property Rights Solutions)	O&F, ch. 10 - Ronald H. Coase (1960) The Problem of Social Cost, <i>Journal of Law and Economics</i> , pg. 1-44, (http://www.sfu.ca/~allen/CoaseJLE1960.pdf)
16 – Decentralized Policies II (Liability Approaches)	O&F, ch. 10, recommended Movie, <i>A Civil Action</i>
17- Decentralized Policies II (Green Goods and Moral Suasion)	O&F, ch. 10
20 – Cap and Trade (Case study of US SO ₂ market)	O&F, ch. 13
19 – Centralized Policy Comparisons	O&F, ch. 11 (standards, 186-197), ch. 12 (tax, 203-212), ch. 13, ch. 14 (pg. 226-230)
21 – Centralized Policy Comparisons Under Uncertainty	O&F, ch. 14 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 VI – Cross Boundary Pollution	
22 – Environmental Problems as Prisoner’s Dilemmas	O&F, ch. 20 - note will be provided online Barrett, Scott (Spring, 1990) The Problem of Global Environmental Protection, <i>Oxford Review of Economic Policy</i> , 6(1), pg. 68 - 79
23 – Trade and the Environment	- note will be provided online

10 How to Learn in this Course

- attend lectures and take careful notes.
- do practice problems (try diligently to do these yourself *before* looking at solutions).
- read text book before lecture. This will provide you with two overviews.
- ask questions during class or office hours and while you are studying. The TA and I like to provide one-on-one help, please visit us!!!
- do all assignments.
- study for tests (do review sheet problems).
- work with other students to share ideas and information (Use Brightspace question forum to ask and answer questions).
- manage your time.
- If you are having trouble focussing your study, see us for advice. We want to help!

ACCOMMODATION POLICY FOR STUDENTS

Students may request accommodation as a result of barriers related to disability, religious obligation, or any characteristic protected under Canadian Human Rights legislation. The full text of Dalhousie's Student Accommodation Policy can be accessed here:

http://www.dal.ca/dept/university_secretariat/policies/academic/student-accommodation-policy-wef-sep--1--2014.html

Students who require accommodation for classroom participation or the writing of tests and exams should make their request to the **Advising and Access Services Centre (AASC)** prior to or at the outset of the regular academic year. More information and the ***Request for Accommodation*** form are available at www.dal.ca/access.

ACADEMIC INTEGRITY

Academic integrity, with its embodied values, is seen as a foundation of Dalhousie University. It is the responsibility of all students to be familiar with behaviours and practices associated with academic integrity. Instructors are required to forward any suspected cases of plagiarism or other forms of academic cheating to the Academic Integrity Officer for their Faculty.

The Academic Integrity website (<http://academicintegrity.dal.ca>) provides students and faculty with information on plagiarism and other forms of academic dishonesty, and has resources to help students succeed honestly. The full text of Dalhousie's ***Policy on Intellectual Honesty*** and ***Faculty Discipline Procedures*** is available here:

http://www.dal.ca/dept/university_secretariat/academic-integrity/academic-policies.html

STUDENT CODE OF CONDUCT

Dalhousie University has a student code of conduct, and it is expected that students will adhere to the code during their participation in lectures and other activities associated with this course. In general:

"The University treats students as adults free to organize their own personal lives, behaviour and associations subject only to the law, and to University regulations that are necessary to protect

- the integrity and proper functioning of the academic and non – academic programs and activities of the University or its faculties, schools or departments;
- the peaceful and safe enjoyment of University facilities by other members of the University and the public;
- the freedom of members of the University to participate reasonably in the programs of the University and in activities on the University's premises;
- the property of the University or its members."

The full text of the code can be found here:

SERVICES AVAILABLE TO STUDENTS

The following campus services are available to help students develop skills in library research, scientific writing, and effective study habits. The services are available to all Dalhousie students and, unless noted otherwise, are free.

Service	Support Provided	Location	Contact
General Academic Advising	Help with <ul style="list-style-type: none"> - understanding degree requirements and academic regulations - choosing your major - achieving your educational or career goals - dealing with academic or other difficulties 	Killam Library Ground floor Rm G28 <i>Bissett Centre for Academic Success</i>	In person: Killam Library Rm G28 By appointment: <ul style="list-style-type: none"> - e-mail: advising@dal.ca - Phone: (902) 494-3077 - Book online through MyDal
Dalhousie Libraries	Help to find books and articles for assignments Help with citing sources in the text of your paper and preparation of bibliography	Killam Library Ground floor Librarian offices	In person: Service Point (Ground floor) By appointment: Identify your subject librarian (URL below) and contact by email or phone to arrange a time: http://dal.beta.libguides.com/sb.php?subject_id=34328
Studying for Success (SFS)	Help to develop essential study skills through small group workshops or one-on-one coaching sessions Match to a tutor for help in course-specific content (for a reasonable fee)	Killam Library 3rd floor Coordinator Rm 3104 Study Coaches Rm 3103	To make an appointment: <ul style="list-style-type: none"> - Visit main office (Killam Library main floor, Rm G28) - Call (902) 494-3077 - email Coordinator at: sfs@dal.ca or - Simply drop in to see us during posted office hours All information can be found on our website: www.dal.ca/sfs
Writing Centre	Meet with coach/tutor to discuss writing assignments (e.g., lab report, research paper, thesis, poster) <ul style="list-style-type: none"> - Learn to integrate source material into your own work appropriately - Learn about disciplinary writing from a peer or staff member in your field 	Killam Library Ground floor Learning Commons & Rm G25	To make an appointment: <ul style="list-style-type: none"> - Visit the Centre (Rm G25) and book an appointment - Call (902) 494-1963 - email writingcentre@dal.ca - Book online through MyDal We are open six days a week See our website: writingcentre.dal.ca

DEPARTMENT OF ECONOMICS STATEMENT ON ACADEMIC INTEGRITY

At Dalhousie University, we respect the values of academic integrity: honesty, trust, fairness, responsibility and respect. As a student, adherence to the values of academic integrity and related policies is a requirement of being part of the academic community at Dalhousie University.

What does academic integrity mean?

Academic integrity means being honest in the fulfillment of your academic responsibilities thus establishing mutual trust. Fairness is essential to the interactions of the academic community and is achieved through respect for the opinions and ideas of others. "Violations of intellectual honesty are offensive to the entire academic community, not just to the individual faculty member and students in whose class an offence occurs." (<http://ug.cal.dal.ca/UREG.htm#12>)

How can you achieve academic integrity?

make sure you understand Dalhousie's policies on academic integrity:

<http://academicintegrity.dal.ca/Policies/>

- do not submit an assignment or essay that is identical to an assignment or essay submitted by another individual or group
- give appropriate credit to the sources used in your assignment or essay
- do not download the work of another from the Internet and submit it as your own
- do not submit work that has been completed through collaboration or previously submitted for another assignment without permission from your instructor
- do not have someone else write an examination or test for you, or write an examination or test for someone else

What will happen if an allegation of an academic offence is made against you?

Instructors are required to report any suspected offence. The full process is outlined in the Discipline flow chart (<http://academicintegrity.dal.ca/Files/AcademicDisciplineProcess.pdf>) and includes the following:

- Each Faculty has an Academic Integrity Officer (AIO) who receives allegations from instructors
- The AIO decides whether to proceed with the allegation and you will be notified of the process
- If the case proceeds, you will receive an INC (incomplete) grade until the matter is resolved
- If you are found guilty of an academic offence, a penalty will be assigned ranging from a warning to a suspension or expulsion from the University and can include a notation on your transcript, failure of the assignment or failure of the course. All penalties are academic in nature.

Where can you turn for help?

- If you are ever unsure about ANYTHING, contact your instructor.
- <http://academicintegrity.dal.ca>

Links to policies, definitions, online tutorials, tips on citing and paraphrasing

- <http://writingcentre.dal.ca>
 - Assistance with proofreading, writing styles, citations
- <http://www.library.dal.ca/How/>
 - Workshops, online tutorials, citation guides, Assignment Calculator, RefWorks
- <http://www.dsu.ca/Services/Advocacy>
 - Assists students with academic appeals and student discipline procedures.
- <http://senate.dal.ca>
 - List of Academic Integrity Officers, discipline flow chart, Senate Discipline Committee