



Faculty of Science Course Syllabus
Department of Economics
ECON2216
The Economics of Global Warming
Winter, 2018

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

Lectures: Mon., Wed., 14:35 – 15:55, LSC Common Area, rm. C236

Office Hours: Tues. & Thurs. 3:30 – 4:30 pm (drop in)

TA: Qichen Zhang, qc329891@dal.ca, Office Hours TBA

Course Description:

This course uses economic principles to investigate such questions as: What are the benefits and costs of various time paths for abating emissions? How do we value the well-being of future generations? How do we balance helping the poor with environmental sustainability? What policies can align incentives with environmental sustainability?

Course Prerequisites and Exclusions:

PREREQUISITES: ECON 1101.03

EXCLUSIONS: ECON2850.06, PHYC2850.06

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

PHYC2800 “Climate Change”, a course in climate change science, is an excellent complement to ECON2216. Taking both PHYC2800 and ECON2216 is similar to taking “The Science and Economics of Climate Change (ECON2850.06 or PHYC2850.06), a full credit course which is offered in the summer term. There is however more integration of the science and economics in the summer course. ECON2216.03 or ECON/PHYC2850.06 will provide you with excellent background for Econ3335, environmental economics or Social Cost Benefit Analysis Econ3350.

Course Objectives/Learning Outcomes:

1. Understand the basic science of the Greenhouse Gas (GHG) problem (global warming, ocean acidification and climate change) problem and scientists’ recommendations.
2. Understand the GHG problem as being social due to externalities such that solutions are not only to be found in the technical sphere but also the social sphere.
3. Understand key categories of net abatement costs and damages and the magnitude of estimates, and also have a basic understanding of how these are estimated and the degree of uncertainty.
4. Understand policy solutions to mitigate and adapt to climate change and pros and cons.
5. Practice applying microeconomics, macroeconomics and environmental economics in the context of global warming.
6. Apply basic linear algebra to finding market equilibrium and socially efficient prices and quantities of GHG emissions and goods under various policy regimes and gain skills

plotting graphs and understanding and using these to do basic welfare analysis and to provide policy advise.

7. Learn and practice statistical computing skills, use Excel to plot data and estimate slopes.
8. Learn and practice critical thinking, writing, and communicating in assignments, tests, practice problems.
9. Understand ethical and moral dimensions the GHG problem and its solutions.
10. Understand the seriousness and urgency of the GHG problem and understand ways that you can contribute to solving the GHG problem.

Course Materials:

Required Textbooks:

Mann M.E. and Kump, L.R. (2015) *Dire Predictions: Understanding Climate Change, The Visual Guide to the Findings of the IPCC*, 2nd Ed.

Stern, Nicolas (2006) *The Economics of Climate Change: The Stern Review* (online at: http://webarchive.nationalarchives.gov.uk/20100407172811/http://www.hm-treasury.gov.uk/stern_review_report.htm)

Brightspace Learning Management System:

The key material for the course is available under “**content**” and “**discussions**” tabs. Announcements are put under “**announcements**” on the home page. Students are responsible for checking “announcements regularly.

Killam Library Reserves:

Olewiler, N.D & Field, B.C. (2002) *Environmental Economics: 2nd Canadian Edition*, McGraw-Hill Ryerson, Toronto.

Tietenberg, T. & Lewis, L. (2010) *Environmental Economics and Policy*, 6th ed., Addison-Wesley

Gore, Al (2006) *An Inconvenient Truth*, Rodale, New York.

Gore, Al (2006) *Earth in the Balance: Ecology and the Human Spirit*, Rodale, New York

Berners-Lee, M. (2011) *How Bad are Bananas? The Carbon Footprint of Everything*, Greystone Books, Vancouver.

Mann M.E. & Kump, L.R. (2015) *Dire Predictions: Understanding Climate Change*, 2nd Ed., Pearson (2 copies are temporarily on reserve due to problems with the book order).

Course Assessment:

Component	Weight (% of final grade)	Date
Test 1	15	Wed, Feb. 7th (in class)
Test 2	15	Wed, Mar. 7 th (in class)
Final exam	40	(Scheduled by Registrar)
Assignments	30	(best 3 out of 4)

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)		

Course Policies

Missed Assignments or Tests: If you miss a test or assignments due to illness, a doctor's note must be provided in which case other assessment components will be given more weight.

IMPORTANT: If you are sick, you must get a doctor's note *while you are sick* so that the doctor can verify that you were sick.

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 Brightspace. Late assignments can be handed into my mailbox, which is on the ground floor of the middle house in the Econ Department. Please get the secretaries to sign and date these prior to depositing them in my mailbox.

Missed Classes: If you miss a class, you are responsible for asking other students if you missed any information and you are advised to get another student's notes.

Announcements: Announcements are made in class and are posted under "News" on the Brightspace Homepage. Students are responsible for checking announcements regularly.

Assignment Policy Regarding Working in Groups: Although you are encouraged to work in groups to solve assignment problems, the work you hand in must be your own including your own wording and ideas. If you work in a group, please indicate the other group members on the top of your assignment but hand in your own assignment. The TA will mark a random selection of questions.

Practice Problems: Practice problems are for practice and are not to be handed in.

Final Exam: The exam period is April 12 – 26th. Students are responsible for *not booking flights prior to the end of the exam period*.

Course Content:

- topics are tentative as time permits.

- corresponding recommended background readings in Stern Review of Climate Change (SR) and Dire Predictions (DP) are indicated below.

- other supplementary readings will be provided on Brightspace.

	Topic:	Background Reading:
I Introductory Section		
1	Introduction: Overview & GHGs as a social problem due to externalities.	N. Stern (2006) "What is the economics of global warming?" https://www.humphreyfellowship.org/system/files/stern_summary_what_is_the_economics_of_climate_change.pdf SR, Executive Summary (read during January)
2	Science of Global Warming, Climate Change and Ocean Acidification.	SR, Ch. 1, DP, Part I & 2 (read over January)
3	Emissions Scenarios, Projections & Options for GHG Emissions Reductions (IPAT & Kaya Identity)	Ch. 7 SR, DP, 92 - 99
4	Markets and Welfare Analysis (private efficiency)	- note
II Economics of Global Warming in Static Market Framework		
5	Market Failure due to Externalities	- note
6	Policies that Directly Target Goods Markets and Life Cycle Assessment	- note - Bernier-Lee (library reserves)

	(LCA)	
7	Socially Efficient Emissions Levels/ One Period MAC MD Framework	- note SR, Ch. 14
8	Policies that Directly Target GHGs (Carbon Taxes, Abatement Subsidies & Standards)	- note
III Measurement of Damages and Abatement Costs and Social Cost Benefit Analysis		
9	Social Cost Benefit Analysis, Discounting, and Climate Change Ethics	SR, Ch. 2
10	Impact Analysis and Damage Measurement	Sections from SR, Ch. 3, 4, 5. DP, Part III (pg. 118 – 149)
11	Abatement Costs and their Measurement	SR, Ch. 10, 11
IV Dynamics of Socially Desirable Abatement		
12	Shifts MACs and MDs related to Emissions Scenarios and RCPs.	DP, 92 – 99, note
13	Stabilization Targets/ Integrated Assessment Models	SR, Ch. 8, Ch. 13, Nordhaus, W. with Satorc, P. (2013) DICE 13R: Introduction and Users Manual
V Mitigation Policy Comparisons, Adaptation and Geoengineering		
14	Cap and Trade and Monetary Cost Effective Abatement	SR, Ch. 15
15	Policy Comparisons of Mitigation Policies	- note
16	Adaptation Policy and Geoengineering	DP, Part IV, 150 – 164, SR, Ch. 18 - 20 DP, 192 - 193
VI Challenges of Short Run Macroeconomics, Global Agreements and Public Misunderstanding		
17	Short Run Macroeconomic Policy/ Limits to Growth	Harris, J. (2009) Ecological Macroeconomics, Consumption, Investment and Climate Change, Real World Econ. Review, 50(1), pp. 34-48
18	Challenges of Negotiating and Enforcing Global Agreements, Carbon Border Tariffs	SR, Ch. 21, 27
19	Problem of Public Misunderstanding	SR, Section 17.4
20	Summary and Road Ahead	

How to Learn in this Course:

- attend lectures and take careful notes.
- do practice problems (make a serious effort *before* looking at solutions).
- do readings before lecture.
- 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 and start early. If you are having trouble, visit office hours for help.
- study for tests (do review sheet problems).
- work with other students to share ideas and information (Use Brightspace to ask and answer questions message board).
- read newspaper and magazine and web site articles about climate change news.
- manage your time.
- If you are having trouble focussing your study, see us for advice. We want to help!

University Policies and Statements:

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>)

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit the office (Rm 3037, McCain Building), e-mail (elders@dal.ca) or leave message (902-494-6803).

Information: https://www.dal.ca/campus_life/communities/native.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Aboriginal Student Centre: https://www.dal.ca/campus_life/communities/native.html

Black Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html **Studying for**

Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html **Copyright Office:**
<https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health Services: https://www.dal.ca/campus_life/health-and-wellness/health-services/services.html

Counselling: https://www.dal.ca/campus_life/health-and-wellness/counselling.html

Student Advocacy: <https://www.dsu.ca/services/community-student-services/student-advocacy-service>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>