

**Faculty of Science Course Syllabus**  
**Department of Economics/Physics and Atmospheric Science**  
**ECON 2850/PHYC 2850 (CRN: 30112/30269)**  
**Science and Economics of Climate Change**  
**Summer 2019 – 6 Credit Hours**

<b>Instructors:</b>	Ruth Forsdyke	<a href="mailto:ruth.forsdyke@dal.ca">ruth.forsdyke@dal.ca</a>	Room C12, Maxwell House
	Glen Lesins	<a href="mailto:glen.lesins@dal.ca">glen.lesins@dal.ca</a>	Room 127, Dunn Building
<b>TAs:</b>	Econ: Raham Moghaddam	<a href="mailto:rh931729@dal.ca">rh931729@dal.ca</a>	
	Phyc: Patrick Duplessis	<a href="mailto:p.duplessis@dal.ca">p.duplessis@dal.ca</a>	
<b>Lectures:</b>	Every weekday from June 3 -June 28. 9:05 am to 12:05 pm Dunn 135		
<b>Tutorials:</b>	ECON tutorial: Fridays. 12 noon to 1 pm		
	PHYC tutorial: Thursdays 12 noon to 1 pm		
<b>Office Hours:</b>	<i>Econ:</i>	Moghaddam 3:30 – 4:30 pm (every day except tutorial days), rm A1, ECON Dept.	
		Forsdyke by appointment	
	<i>Phyc:</i>	Lesins by appointment	
		Duplessis by appointment	

---

### Course Description

This course examines how climate change will impact the environment and human activities, and how to formulate and implement economically realistic solutions. It integrates the physical and biological science with economics to analyze the response options as we move to eliminate carbon emissions. The design and use of simple climate and economic models will be covered.

### Course Prerequisites

ECON1101.03 or ECON1102.03 or any first year MATH or STAT course

### Exclusions

PHYC2800.03, ECON2216.03

### Course Objectives/Learning Outcomes

1. Understand the science behind climate change and the predicted impacts.
2. Understand how economists explain global warming as a social problem.
3. Examine mitigation and adaptation solutions that are scientifically and economically reasonable.
4. Practice applying microeconomics and environmental economics in the context of global warming.
5. Learn the use of a simple Integrated Assessment Model.
6. Be able to analyze media coverage of climate change.
7. Understand policy solutions to global warming, climate change, and ocean acidification.
8. Gain experience with working in a team to tackle climate change issues.
9. Learn critical thinking skills.
10. Improve numeracy skills with daily mini-assignments.

### Course Materials

Course materials will be uploaded to the Brightspace course website.

Required Textbooks:

**Science:** Dire Predictions by Mann & Kump, 2<sup>nd</sup> Ed., ISBN 978-1-4654-3364-0

**Economics:** Stern Review of the Economics of Climate Change by Nicholas Stern, available online in Brightspace.

**Course Assessment**

Final Exam (Friday June 28 in class)	35 %
Mini-assignments (due next morning at 9 am)	20 %
Quiz 1 (Monday June 10 <sup>st</sup> )	10 %
Quiz 2 (Monday June 17 <sup>th</sup> )	10 %
Group Project	
Written Proposal (Fri June 14)	3%
Oral Presentation (June 24/25)	10%
Written Report (Wed June 26)	12%
Project Total	25%

**Other course requirements**

None

**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)		

**Mini assignments**

Mini assignments are short daily assignments that are usually given out during class and are due the following day at 9 am. They may be based on in-class exercises and worksheets such that missing lectures may make it difficult or impossible to achieve full marks.

**Course Policies**

A doctor's explanation note is required for any missed component in the grading scheme.

There are no make-up quizzes or exams.

No late submissions will be accepted without prior approval.

If you need to leave class early, please inform the professor ahead of time so as not to disrupt the class.

Students are responsible for checking the Brightspace for Announcements, Course Information, etc.

**Tentative Course Content, Schedule and Deadlines (Mini-Assignments Due 9 am most days)**

<b>June</b>	<b>#</b>	<b>Science</b>	<b>Economics</b>
<b>Week 1 – Concepts</b>			
Mon 3	1	Environment – Economy Linkages Climate and Economic System Components IPAT & Kaya Identity Analysis Evidence of Climate Change Types of GHGs & sources, Climate Change as a Social Problem due to Externalities.	
Tues 4	2	Radiation & Energy Balance Greenhouse Effect & Surface Temper.	Markets & Welfare Analysis
Wed 5	3	Greenhouse Gases & Carbon Cycle Aerosols	Market Failure due to Externalities
Thur 6	4	Water / Clouds / Ice / Oceans <b>SCI Tutorial #1</b>	Policies to Correct the Market
Fri 7	5	Planetary Energy Imbalance Climate Change & Radiative Forcing	Abatement Costs & Damage Framework <b>ECON Tutorial #1</b>
<b>Week 2 - Models</b>			
Mon 10	6	<b>QUIZ</b> Feedbacks & Sensitivity	<b>QUIZ</b> Abatement Costs/ Discounting Mechanics
Tues 11	7	Impacts, Damages & Monetization	
Wed 12	8	Integrated Assessment Models I	Integrated Assessment Models I
Thur 13	9	Integrated Assessment Models II <b>SCI Tutorial #2</b>	Integrated Assessment Models II
Fri 14	10	IPCC Summary	RCPs, Socioeconomic Scenarios & Climate Change Perspectives <b>ECON Tutorial #2</b>
		<b>Project Proposal Due</b>	
<b>Week 3 – A New Future</b>			
Mon 17	11	<b>QUIZ</b> Steady-State Economy	<b>QUIZ</b> Short Term Macroeconomics/ Green New Deal
Tues 18	12	Energy Demand Alternative Energy Sources	Cap and Trade
Wed 19	13	Tipping Points	Cap and Trade
Thur 20	14	Adaptation vs Mitigation <b>SCI Tutorial #3</b>	Mitigation Policy Comparisons
Fri 21	15	Geoengineering / Negative Emissions	Adaptation Policy/ Geoengineering <b>ECON Tutorial #3</b>
<b>Week 4 – Projects and Wrap-up</b>			
Mon 24	16	<b>Project Day 1: Student Presentations</b>	
Tues 25	17	<b>Project Day 2: Student Presentations</b>	
Wed 26	18	Project Day 3: Climate Change Treaty Negotiations	
		<b>Written Report Due 9am</b>	
Thur 27	19	Summary Emissions Gap Wind & Solar Energy Future <b>SCI Tutorial #4</b>	Summary Problem of Public Misunderstanding Alternative Approaches <b>ECON Tutorial #4</b>
Fri 28	20	<b>FINAL EXAM</b>	<b>FINAL EXAM</b>

## **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](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](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](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](mailto:elders@dal.ca)) or leave message (902-494-6803).

**Information:** [https://www.dal.ca/campus\\_life/communities/native.html](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](https://www.dal.ca/academics/important_dates.html)

## University Grading Practices

[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](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](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](https://www.dal.ca/campus_life/communities/native.html)

**Black Advising Centre:** [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)

**International Centre:** [https://www.dal.ca/campus\\_life/international-centre/current-students.html](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](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](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](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](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](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>