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

Instructors: Ruth Forsdyke ruth.forsdyke@dal.ca Room C12, Maxwell House
Glen Lesins glen.lesins@dal.ca Room 127, Dunn Building
TAs: Econ: Raham Moghaddam rh931729@dal.ca
Phyc: Patrick Duplessis p.duplessis@dal.ca

Lectures: Every weekday from June 3 -June 28. 9:05 am to 12:05 pm Dunn 135
Tutorials: ECON tutorial: Fridays. 12 noon to 1 pm
PHYC tutorial: Thursdays 12 noon to 1 pm

Office Hours: Econ: Moghaddam 3:30 – 4:30 pm (every day except tutorial days), rm A1, ECON Dept.
Forsdyke by appointment
Phyc: 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:
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 10th) 10 %
Quiz 2 (Monday June 17th) 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)

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


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](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).


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

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://library.dal.ca/services/copyright-office.html
Fair Dealing Guidelines: https://library.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
Scent-Free Program: https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html