EAS 501.022: Climate Economics and Policy

Winter 2019 Course Syllabus
(Version: January 10th, 2019)

Logistics

Lecture: T/Th 1:00-2:20 p.m. (Dana 1028)
Professor: Samuel Stolper (sstolper@umich.edu)
Graduate Student Instructor: Benjamin Rego (benrego@umich.edu)
Website: https://umich.instructure.com/courses/270321
Office Hours: T 3:00-4:00pm, Th 4:00-5:00pm, Dana 3006 (Prof. Stolper)
M 12:00-1:00pm, W 11:30am-12:30pm, Dana 4325 (Ben)

About this course

Climate change is sometimes called the greatest challenge humanity as a whole has ever faced. It is a truly global collective action problem, whose social costs will be massive, widespread, unpredictable, and inequitably distributed. Economic analysis of the climate problem is valuable for a number of reasons: economics provides a framework for understanding incentives for human behavior; it facilitates the measurement of costs and benefits; and it is a language to which people listen, from the highest levels of government down to the individual household. In this course, we will use the lens of economics to clarify the costs and benefits of climate change, the challenges of climate change mitigation, and the theoretical and empirical impacts of the climate policies at our disposal. We will start by reviewing some foundational economic concepts and studying the impacts of climate change. From there, we will set our sights on the general policy problem and assess the performance of different policy instruments along a variety of dimensions. In the second half of the course, we will zero in on the two largest sources of greenhouse gas emissions globally: electricity and transportation.

Suggested prior coursework: EAS 570. Environmental Economics: Principles, Methods, and Tools; or equivalent coursework elsewhere

Class format and teaching goals

I have designed this course with several teaching goals in mind. I want you, the students, to:

• Become knowledge experts in the area of climate economics and policy
• Develop a versatile economic intuition, for use in any environmental professional setting
• Become more comfortable with quantitative thinking and analysis
• Improve your ability to communicate, translate, and wield rhetoric in the highly divisive scientific debate about how to respond to the changing climate

I think the best way to achieve these goals is to engage you, the students, as much as possible, and in as many ways as possible. I will devote some part of most class meetings to lecture, but I will also emphasize discussion, both during lecturing and in dedicated periods of class time. I will strive to make students feel comfortable speaking up and raising questions. In-class activities will not be limited to lecture and discussion; we will also play a multi-round, team-based game simulating Michigan’s wholesale electricity market, devote two class days to student group presentations on policies of interest, and possibly take a tour of U of M’s Central Power Plant. Lastly, course assignments will give you practice in a variety of tasks to which you may be exposed in your future careers.

Readings

For most classes, you will be assigned readings from some combination of textbook, academic journals, blogs, and popular media. There is less assigned reading in this course than in many others; as a result, I expect everyone to complete it.


Several of the assigned readings come from the blog run by the Energy Institute at Haas, based at the University of California Berkeley, Haas School of Business. There is an excellent group of environmental and energy economists at Berkeley, and I encourage you to peruse the blog (https://energyathaas.wordpress.com/) beyond the assigned readings.


Assignments and grading

I have designed the assignments in this course to help you develop skills that I think will be useful in your professional environmental careers. These assignments are listed below, along with class participation and two exams. Numbers in parentheses are weights for each graded component in your final grade.

• Class participation (10%): Speaking up in class will give you valuable practice communicating in your future careers, and the course will be more fun and more thought-provoking if we all share our perspectives, our questions, our ideas.
• Problem sets (10%): Two problem sets will give you practice working through foundational models of supply and demand in different settings.

• Op-ed (5%): The format and readership of a newspaper op-ed is a good setting in which to practice written communication to a broad, non-expert audience.

• Policy analysis (10%): Here you will play the role of government analyst, assessing the impacts of a proposed policy and summarizing your findings for your superiors.

• Midterm exam (15%): You will be tested on your understanding of material covered in the first half of the course.

• Program evaluation (10%): Playing the role of an analyst at an electric utility, you will evaluate the impacts of an energy efficiency program, using data on treatment status and household electricity use over time. You will describe your findings in a short report.

• Electricity game memo (10%): With your team, detail the strategies you employed in the electricity game, what went right and wrong, and why.

• Group presentation (10%): With your team, you will make a 12-minute presentation on, and answer questions about, a climate policy of your choosing. Available policies will be provided at the outset of the course, and students will each be assigned to one based on stated preferences.

• Final exam (20%): You will be tested on your understanding of material covered throughout the semester.

Problem sets and written assignments are due at the beginning of class, unless otherwise stipulated. Please submit problem sets via hard copy in class to Ben, and writing assignments digitally to Canvas. Late (unexcused) assignments will be penalized 5 percentage-points per day. I grade this course on a curve, aiming to give A/A- grades to approximately 40% of students. The exact percentage varies from year to year.

Other course information

Attendance: You may miss up to three class meetings without excuse. Beyond this number, your attendance grade will be affected by absences and lateness without timely explanation and reasonable justification. I will try my best to accommodate religious observance that affects your attendance or more generally ability to complete course activities; please try to inform me in advance of known absences or difficulties. Don’t hesitate to come talk to me in person if attendance is an issue for you.

Laptops and phones: Neither laptops nor phones are allowed in class. They would inevitably draw your attention away from class lecture and discussion.

Correspondence: We (Ben and I) will try to get back to your emails within 24 hours. Please note EAS 501 in your subject line. If you plan on asking multiple involved questions, please come to office hours or schedule a meeting.

Grade grievances: You must submit requests for a re-grade within one week of receiving the original grade. You must also attach the original graded item and provide a clear written
explanation of what you would like to be re-evaluated and why. Your adjusted grade may be
higher or lower than the original.

Work ethic: Do not plagiarize. If you paraphrase or copy work that is not your own, you
must reference that work. The risk of plagiarizing is not worth the reward. More generally,
cheating and academic dishonesty in any form will not be tolerated. Any student found to
have cheated or behaved unethically or dishonestly will be given a zero on the assignment or
exam involved and referred to the appropriate disciplinary committees at U of M.

Writing resources: The Sweetland Center for Writing offers one-on-one writing assistance,
among many other services. It also offers mini-courses and casual conversation groups for
international students or anyone wanting to improve their English.

### Course calendar

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<thead>
<tr>
<th>Date</th>
<th>Day</th>
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<th>Unit</th>
<th>Assignment Due</th>
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<td>1/10</td>
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<td>1</td>
<td>Introduction</td>
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<td>1/15</td>
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<td>Costs, benefits, supply, and demand</td>
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<td>1/17</td>
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<td>3</td>
<td>Externalities and public goods</td>
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<td>4</td>
<td>The impacts of climate change</td>
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<td>5</td>
<td>The social cost of carbon</td>
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<td>6</td>
<td>International climate policy</td>
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<td>1/31</td>
<td>Th</td>
<td>7</td>
<td>Policies in theory I: carbon pricing</td>
<td>Problem set 1</td>
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<td>Policies in theory II: markets vs. mandates</td>
<td>Op-ed</td>
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<td>Policies in practice I: cost-effectiveness</td>
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<td>Policies in practice II: distributional equity</td>
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<td>Policies in practice III: political economy</td>
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<td>Policies in practice IV: trade</td>
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<td>Group presentations I</td>
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<td>14</td>
<td>Review</td>
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<td>Electricity I: power systems</td>
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<td>Electricity II: power plants</td>
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<td>Electricity III: renewables</td>
<td>Problem set 2</td>
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<td>Electricity IV: portfolio auction</td>
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<td>Electricity V: climate policy</td>
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<td>Energy efficiency</td>
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<td>Transportation I: fuel economy</td>
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<td>Transportation II: buses, trains, automobiles</td>
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<td>Transportation III: electrification</td>
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<td>Transportation IV: ridesharing and automation</td>
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<td>Group presentations II</td>
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<td>Case study: U of M GHG emissions</td>
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<td>4/23</td>
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<td>28</td>
<td>Review</td>
<td>Electricity game memo</td>
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<td>4/26</td>
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<td>Final exam</td>
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Detailed course schedule

Class #1 – January 10th. Introduction

Class #2 – January 15th. Costs, benefits, supply, and demand
Readings
1. KO: Chapter 3, pp. 44-48; Chapter 4, pp. 70-79.

Class #3 – January 17th. Externalities and public goods
Readings
1. KO: Chapter 5, pp. 80-94.

Class #4 – January 22nd. The impacts of climate change
Readings

Assignments
1. Problem set 1 due

Class #5 – January 24th. The social cost of carbon
Readings

Class #6 – January 29th. International climate policy
Readings
1. KO: Chapter 5, pp. 94-97.

Class #7 – January 31st. Policies in theory I: carbon pricing

Readings

1. KO: Chapter 8, pp. 143-162.

Class #8 – February 5th. Policies in theory II: markets vs. mandates

Readings

1. KO: Chapter 9, pp. 168-184.

Assignments

1. Op-ed due

Class #9 – February 7th. Policies in practice I: cost-effectiveness

Readings

2. TBD

Class #10 – February 12th. Policies in practice II: distributional equity

Readings


Class #11 – February 14th. Policies in practice III: political economy

Readings

Class #12 – February 19th. Policies in practice IV: trade

Readings

2. TBD

Assignments

1. Policy analysis due

Class #13 – February 21st. Group presentations I

Class #14 – February 26th. Review

Class #15 – February 28th. Midterm

March 5th. NO CLASS – SPRING BREAK

March 7th. NO CLASS – SPRING BREAK

Class #16 – March 12th. Electricity I: power systems

Readings


Class #17 – March 14th. Electricity II: power plants (field trip)

Readings

Class #18 – March 19th. Electricity III: renewables

Readings


Assignments

1. Problem set 2 due

Class #19 – March 21st. Electricity IV: portfolio auction

Readings

1. TBD

Class #20 – March 26th. Electricity V: climate policy

Readings


Class #21 – March 28th. Energy efficiency

Readings


Class #22 – April 2nd. Transportation I: fuel economy

Readings


Class #23 – April 4th. Transportation II: buses, trains, automobiles

Readings


Class #24 – April 9th. Transportation III: electrification

Readings


Assignments

1. Program evaluation due

Class #25 – April 11th. Transportation IV: ride-sharing and automation

Readings


Class #26 – April 16th. Group presentations II

Class #27 – April 18th. Case study: U of M GHG emissions

Readings

1. TBD
Class #28 – April 23rd. Review

Assignments

1. Electricity game memo due

FINAL EXAM – April 26th, 4:00 pm – 6:00 pm