Syllabus
Economics 970-SS. The Economics of Climate Change

Instructor: Samuel Stolper <samuel_stolper@hks.harvard.edu>
Meeting Times: Tuesdays and Thursdays, 1:00 pm – 2:30 pm
Meeting Location: Sever 111
Website: <http://isites.harvard.edu/icb/icb.do?keyword=k100981>
Stata Tutorial Website: <http://isites.harvard.edu/icb/icb.do?keyword=k12758&pageid=icb.page649769>
Office Hours: Thursdays, 3:00pm – 5:00pm, HKS Taubman Carrel #5.

Prerequisites:
1. Completion of or concurrent enrollment in Economics 1011a (recommended) / 1010a1 / 1010a2
2. Completion of or concurrent enrollment in Statistics 100 / 104 / 110 or Applied Math 101 or Math 154

Additionally, enrollment in Economics 1123 / 1126 is highly encouraged.

Course Description

Climate change can be viewed as a fundamentally economic problem: Emissions of greenhouse
gases have no economic value, so they are freely overproduced, to the entire planet’s detriment.
However, climate change has a unique set of attributes that make standard economic analysis
very difficult to apply. It is a global problem requiring unprecedented international
cooperation. It is pervaded by uncertainty in every step of the process of translating global
emissions into local damages. The costs and benefits of its mitigation are highly mismatched
geographically as well as temporally. And its damages are largely irreversible.

This class is about breaking down the many challenges of climate change and seeing what
economics research has done to address them. We will learn what is known (and what is not
known) about the economic damages of climate change; we will study theoretical models that
clarify the policy problem; and we will examine existing and potential climate policies and their
relative strengths and weaknesses. In the process, we will practice at developing and carrying
out empirical economics research, as well as writing and speaking about it.

Economics 970 emphasizes discussion as a mode of learning. This section’s class format reflects
that emphasis: Each class will generally consist of a one-hour discussion of a single assigned
academic article, followed by twenty minutes of lecture to prepare students for the next
assigned reading. Our study of climate economics thus prioritizes depth at the cost of some
breadth. Nonetheless, students will, at the end of this course, know more about the economics
of climate change than 99% of the world and also be equipped to begin carrying out research on
this all-important topic.
Course Requirements

Class Participation (20%): A major part of this course is becoming comfortable interacting with economics research. In every class, we will pick a published paper and discuss its motivations, objectives, research strategy, findings, strengths, and weaknesses. I expect you to come prepared to participate in this discussion.

Commentaries (10%): Every week, you must submit a one-page response to one of that week’s assigned readings. Since these are short, you should focus on just one or two points you want to make. That can mean, for example, a question about the analytical strategy, a criticism of the paper, or an idea for a related research idea. Half of the class will be responsible submitting a commentary on Tuesday’s reading(s), and the other half will be responsible for submitting a commentary on Thursday’s reading(s). However, you may choose any two weeks in which to not submit a commentary.

Short Papers (15%): There are two short paper assignments, for which you should write 3-5 pages each. The first is a summary of arguments about ‘discounting’ in climate policy analysis. The second is an explanation of an economic model of uncertain climate change impacts. The point of these assignments is to improve both comprehension and translation of economics research.

Empirical Exercise (10%): All students enrolled in Economics 970 will attend a four-week Stata mini-course and complete four associated problem sets. These problem sets will guide you through writing your own Stata “do-file” to analyze numerical datasets, which is a key component of empirical economics research.

Short Presentation (5%): In our April 1st class, you will each be part of a small group (2-4 students) charged with teaching one of the assigned readings. The readings are taken from a very recent Journal of Economic Literature symposium on ‘current issues in climate economics.’ Your group will have 20 minutes to collectively teach your assigned reading to the class and lead a discussion.

Research Paper (40%): As a final project, you will write an original research paper (15-20 pages in length) on any topic relevant to the economics of climate change, as long as it involves either theoretical modeling or empirical analysis. You will develop your research in stages. First you must schedule a meeting with me during the week of 2/25-3/1 to discuss possible topics. Then you will sketch out your work in a series of brief assignments: A research proposal (due March 11th); a literature review (March 25th); and a description of your planned analysis (April 8th). The final paper is due May 5th. I will give you comments at each stage and am more than happy to discuss topics and/or strategy with you at any time.
Course Policies

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

Correspondence: I will try to get back to your emails within 24 hours. Please note ECON-970 in your subject line. If you plan on asking multiple involved questions, please schedule a meeting with me.

Absences: Participation is especially important in this class, since ECON-970 is designed to help you discuss economics intelligently. You are allowed one excused absence if you let me know beforehand. Any further absence will result in a deduction from your participation grade equal to one-third of a letter grade (e.g., from A to A-).

Grading: I will grade weekly commentaries on a ✓+✓/✓- basis, and aggregate them to a letter grade at the end of the semester. All other individual assignments will be given a letter grade. I will re-grade at most one assignment for each student. You must submit the request 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.

Homework Submission: Weekly commentaries are due at the beginning of class each Thursday. Late commentaries will be docked one grade (e.g., from ✓+ to ✓). All other assignments are due by 5pm on the designated day and will be docked one-third of a letter grade per day of lateness.

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. For reference, see the section on ‘Academic Performance’ in the Handbook for Students: <http://handbook.fas.harvard.edu/icb/icb.do?keyword=k95151&pageid=icb.page584280>
Outline of Class Topics

I. Introduction (February 4th)
II. Defining Concepts (February 6th – February 20th)
III. Climate Damages (February 25th and February 27th)
IV. Mitigation Costs (March 4th and March 6th)
V. Cost-Benefit Analysis (March 11th – April 1st)
VI. Policy Instruments (April 3rd – April 29th)

Due Dates
Commentaries (1 page): Due weekly (but you may skip two of your choice)
Stata Problem Set #1: Due Friday, February 14th
Short Paper #1 (3-5 pages): Due Tuesday, February 18th
Stata Problem Set #2: Due Wednesday, February 26th
Short Paper #2 (3-5 pages): Due Tuesday, March 4th
Stata Problem Set #3: Due Thursday, March 13th
Proposal for Research Paper (1 page): Due Tuesday, March 25th
Short Presentation (25 minutes per group): Due Tuesday, April 1st
Stata Problem Set #4: Due Wednesday, April 2nd
Literature Review for Research Paper (2-3 pages): Due Thursday, April 3rd
Analysis Plan for Research Paper (2-3 pages): Due Thursday, April 10th
Final Research Paper (15-20 pages): Due Monday, May 5th
Detailed Course Schedule

Tuesday, February 4th. Introduction: The Nature of the Climate Problem
Readings:

Readings:

Thursday, February 6th – Stata Session #1

Tuesday, February 11th. Defining Concepts II: Discounting
Readings:

Thursday, February 13th. Defining Concepts III: Uncertainty
Readings:

Friday, February 14th (not a class)
Assignments:
- Stata Problem Set #1 due
Tuesday, February 18th. Defining Concepts IV: Distribution of Damages
Readings:

Assignments:
- Short Essay #1 due

Tuesday, February 18th – Stata Session #2

Thursday, February 20th. Defining Concepts V: Irreversibility
Readings:

Tuesday, February 25th. Climate Damages I: Catastrophic Damage
Readings:
3. Angrist, J.D. and A.B. Krueger (1991). “Does Compulsory School Attendance Affect Schooling and Earnings?” *Quarterly Journal of Economics* 106(4): 979-1014 (*We will discuss this paper because you will be replicating its results for your Stata tutorial*).

Assignments:
- Schedule a meeting with me this week to discuss possible research topics

Wednesday, February 26th (not a class)
Assignments:
- Stata Problem Set #2 due

Thursday, February 27th. Climate Damages II: Non-Catastrophic Damage
Readings:
Tuesday, March 4th. Mitigation Costs I: Competitiveness  
Readings:  
Assignments:  
- Short Essay #2 due

Tuesday, March 4th – Stata Session #3

Thursday, March 6th. Mitigation Costs II: Trade and the Environment  
Readings:  

Tuesday, March 11th. Cost-Benefit Analysis I: Integrated Assessment Models  
Readings:  

Thursday, March 13th. Cost-Benefit Analysis II: Social Cost of Carbon  
Readings:  
Assignments:  
- Stata Problem Set #3 due

Tuesday, March 18th – No class. Spring Break.

Thursday, March 20th – No class. Spring Break.
Tuesday, March 25th. Cost-Benefit Analysis III: Credibility of CBA
Readings:

Assignments:
- Proposal for Research Paper due

Tuesday, March 25th – Stata Session #4

Thursday, March 27th. Cost-Benefit Analysis IV: Alternatives to CBA
Readings:

Tuesday, April 1st. Cost-Benefit Analysis V: Symposium on Current Issues
Readings:

Assignments:
- Students lead discussions of assigned symposium articles.

Wednesday, April 2nd (not a class)
Assignments:
- Stata Problem Set #3 due

Thursday, April 3rd. Policy Instruments I: Market-Based Policies
Readings:

Assignments:
- Literature Review for Research Paper due
Tuesday, April 8th. Policy Instruments II: Command-and-Control Policies  
Readings:  

Thursday, April 10th. Policy Instruments III: European Union – Emissions Trading Scheme  
Readings:  
Assignments:  
- Analysis Plan for Research Paper due

Tuesday, April 15th. Policy Instruments IV: U.S. Cap-and-Trade Programs  
Readings:  

Thursday, April 17th. Policy Instruments V: Standards, Subsidies, and Tariffs  
Readings:  

Tuesday, April 22nd. Policy Instruments VI: International Policy Design  
Readings:  
Thursday, April 24th. Policy Instruments VII: Energy Efficiency
Readings:

Tuesday, April 29th. Policy Instruments VIII: Policy Debate
No Readings – We will watch a video of a one-on-one debate over energy policy and discuss.

Monday, May 5th (no class)
Assignments
- Final Research Paper due