Syllabus Winter 2022: PPHA 39930
International Climate Policy
Version updated: Oct 22nd, 2021

Instructor: Amir Jina

Course Materials:

(1) Course slides posted weekly on Canvas
(2) Readings for each week to be provided on this syllabus. These will be a mix of academic articles, newspaper articles, blog posts, videos, and podcasts
(3) [Optional resource: Pre-recorded videos from winter 2021]

Course Objective:

Anthropogenic climate change is one of the most difficult challenges faced by modern society. And time to tackle it is running out. This decade is the last where society will have a chance to avoid the worst impacts. If we fail to mitigate the causes of climate change, we will be left with only options to adapt. No matter what career you pursue over the next 10 years, it's unlikely that it will be untouched by some considerations of climate change and its impacts. Being able to look at and engage with climate change from multiple perspectives has never been more important.

This interdisciplinary course covers the tools and insights from economic analysis, environmental science, and statistics that inform our understanding of climate change impacts, the design of mitigation and adaptation policies, and the implementation of these policies. Students will develop a mastery of key conceptual ideas from environmental economics relevant for climate change and acquire tools, both theoretical and empirical, for conducting analyses of climate impacts and policies. The goal is to help students become informed and critically-minded practitioners of evidence-based, climate-informed policy making.

Climate change is also the subject of ongoing debate and discussion. Winter 2022 will also be incredibly relevant for this debate. We will assess and digest the global commitments of the Glasgow COP26 climate negotiations, and the Biden administration's first year of efforts to pass climate policy. We will additionally discuss major issues that have arisen in the past few years about climate policy. Be prepared to share and read news articles that cover many of these current topics. For better or worse, I am somewhat involved in a few ongoing discussion in climate policy, and will attempt to draw from these experiences and the writing and discussion of my collaborators.

Class Preparation:

Class preparation will primarily involve reading the required materials and viewing pre-recorded material, with short quiz answers, before each discussion. Any of the assigned readings or lecture topics may be the subject of classroom discussions, and each of you is expected to join in classroom discussions and debates.

Software:

This course will require you to follow lectures and complete assignments using any statistical software, with a particular emphasis on STATA or R. R was, is, and always will be free.

Course Grading and Evaluation (ALL PRELIMINARY)

Reading reflections: Throughout the quarter you will be required to do **THREE** reading reflections. One should be in the first 3 weeks, one in the next 3 weeks, and one in the final 3 weeks. The content of these will not be graded, but they will be incorporated into some class discussion in some cases. Please post your reflection as a response to that weeks' reading reflection discussion topic. These can be found in the relevant module or linked on the front page of canvas.

Climate facts or figures: Throughout the quarter you will be required to post **THREE** "climate facts or figures" posts. One should be in the first 3 weeks, one in the next 3 weeks, and one in the final 3 weeks. These can be anything you want - an article, a blog post, a particularly controversial twitter thread, a single figure or graph, etc. - and should ideally be something you find in your personal exploration or contemporary policy topics. Each week, I'll post an example or two as well. This is one of the most important ways for us to bring current issues into the class discussions. Please post your fact or figure as a response to that weeks' climate facts or figures discussion topic. These can be found in the relevant module or linked on the front page of canvas.

Individual assignments: There will be three individual assignments throughout the quarter. These will require a combination of data analysis and interpretation, sometimes quantitative, sometimes qualitative. All data analysis is expected to be replicable, with you submitting code in addition to your answers.

Group projects and discussions: There will be one group assignments during the quarter. Op-ed. Students propose, or choose, a major topic related to the upcoming negotiations, and write an op-ed about it that could be published online, but aimed at technically sophisticated readers (i.e., someone like a negotiator) rather than general public.

Approximate assignment dates are as follows:

Component	Date available	Date due	Percent of grade	
Individual assignment 1			15%	
Individual assignment 2			15%	
Individual assignment 3			15%	
Individual assignment 4			15%	
Group assignment			30%	
Reading reflections	-	-	5%	3 for 5%, 2 for 3%, 1 for 1%
Climate facts or figures	-	-	5%	3 for 5%, 2 for 3%, 1 for 1%

Late submission policy

Each student will have two 24-hour "tokens". You can use these one-at-a-time or both together for no-questions-asked extensions to deadlines for any of the assignments. If assignments are late with no tokens remaining, and with no other explanation, you'll lose 5% per day of overage. We're all busy and times are weird, so if you've got circumstances that involve extra difficulty, message Aman and I about it.

Re-Grades

Any item for which there is a re-grade request must be done within 7 days after we return the assignment or exam to you. The request for re-grade MUST be done in writing and attached to the assignment. In such cases, **we will re-grade the whole assignment**– not just the question you identified. As a result, your grade may be lower.

Communication

Communication from instructors to students will happen through posting of materials on Canvas and class email sent through Canvas. **Emailing me directly is likely to be the least efficient way to communicate about the class, with office hours or messages on Canvas highly preferred. Please cc your TA on messages.** *Questions regarding scheduling, class materials, or assignments* should be directed to your TA.

Detailed syllabus and readings (WILL CHANGE BEFORE CLASS)
NOTE: Required readings are indicated with a '**' before their entry. Readings that underpin or reinforce core concepts in the class but are not strictly required are marked with a '*'. Other readings are optional, and will either be referred to in class or provide extra background / detail on a topic. I'll provide some context on readings each week in class.

Part I: The Science and Economics of Climate Change (week 1-2)

1) A Crash Course in Climate Science for Policy-Makers (plus class introduction)

Topics: Greenhouse effect; Climate culprits; Residence time; Emissions trends and distribution; Emissions scenarios; Emissions sources; Global climate models; IPCC coordination of climate science; Heterogeneity of climate changes; Energy and energy intensity; Climate sensitivity;

a. **IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

a. **Clark, D. (2011). What's the target for solving climate change? The Guardian. http://www.guardian.co.uk/environment/2011/nov/14/climate-change-targets
b. Carbon Brief (2018), "Explainer: How "Shared Socioeconomic Pathways" explore future climate change" https://www.carbonbrief.org/explainer-how-shared-socioeconomic-pathways-explore-future-climate-change
c. Carbon Brief (2019), "The high-emissions 'RCP8.5' global warming scenario" https://www.carbonbrief.org/explainer-the-high-emissions-rcp8-5-global-warming-scenario
d. Hayhoe, K., D.J. Wuebbles, D.R. Easterling, D.W. Fahey, S. Doherty, J. Kossin, W. Sweet, R. Vose, and M. Wehner, 2018: Our Changing Climate. In Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II https://nca2018.globalchange.gov/chapter/2/
e. J. T. Kiehl and Kevin E. Trenberth, Earth's annual global mean energy budget, *Bull. Amer. Meteor. Soc.***78** (1997), 197–208.

2) The Nature of the Climate Problem

Topics: The Commons; Externalities and Public Goods; Energy and growth; "Common but Differentiated Responsibilities"; International climate negotiations; Adaptation; Mitigation; Uncertainty in emissions and parameters; Discounting and valuing the future; Social Cost of Carbon; Abatement costs; Optimal climate policy; Cost-benefit Analysis;

a. **Fullerton, Don, and Robert Stavins. "How Economists See the Environment." Nature 395 (1998): 433–434.
b. **Keohane, Nathaniel O., and Sheila M. Olmstead. Markets and the Environment. Island Press, 2016. Chapters 1 and 2.
c. **Goulder, Lawrence and William A. Pizer (2008). The economics of climate change. In The New Palgrave Dictionary of Economics 2nd edition. Hampshire, UK: Palgrave Macmillan
d. Stern, Nicholas (2008), "The Economics of Climate Change", American Economic Review: Papers & Proceedings, 98(2), 1-37. Read up to Section 3.

Part II: Climate Impacts and Climate Justice (weeks 3-6)

3) Climate Impacts

Topics: GCMs; Biophysical impacts methods; Socioeconomic impacts methods; Integrated Assessment Models (IAMs); Biophysical impacts; Economic impacts; Adaptation; Hedonic regression; Panel regressions; dose-response;International climate impacts; US and wealthy country climate impacts; Developing nation impacts; socioeconomic impacts; dose-response; damage function; labour; agriculture; energy; health; conflict; ecosystems services; water; sea level rise impacts; TFP and GDP; Economic growth impacts;

a. **Keohane, Nathaniel O., and Sheila M. Olmstead. Markets and the Environment. Island Press, 2016. Chapter 3 and 4.

b. **Carleton, T.A. and S.M. Hsiang (2016). "Social and economic impacts of climate". Science 353(6304).
c. **Hsiang, S. et al. (2017). Estimating economic damage from climate change in the United States. Science, 356(6345), 1362-1369.
d. Dell M, Jones B, Olken B. What Do We Learn from the Weather? The New Climate-Economy Literature. Journal of Economic Literature. 2014. Sec. 2.1 and 4.1
e. Wagner, Gernot, and Martin Weitzman. "Inconvenient Uncertainties," New York Times, October 10, 2013

4) Integrated Assessment, Discounting, and the Social Cost of Carbon

Topics: Cost-benefit analysis; Social Cost of Carbon in practice;

a. **Committee on Assessing Approaches to Updating the Social Cost of Carbon (2017). Valuing Climate Damages. Executive Summary and Structure of the Estimation Process (pages 1-3 and 39-43).
b. **Mooney, Chris (2017). New EPA document reveals sharply lower estimate of the cost of climate change
c. Pindyck, R.S. (2013). "Climate Change Policy: What Do the Models Tell Us?" Journal of Economic Literature 51(3): 860-872
d. Nordhaus, W. (2013). Chapter 16 - Integrated Economic and Climate Modeling. Handbook of Computable General Equilibrium Modeling. B. D. Peter and W. J. Dale, Elsevier. Volume 1: 1069-1131. Read up to Section 16.1.10.

5) Climate Justice and the Ethical Dimensions of Climate Change

Topics: Climate Justice; Equity and Inequity aversion; Climate change and human rights; Distributional equity; Hedonic sorting; Energy access; Inequality of climate impacts;

a. **Dietz, S., Hepburn, C., and Stern, N. 2009. Economics, ethics and climate change. Arguments for a Better World: essays in honour of Amartya Sen (Volume 2: society, institutions and development) [Kaushik Basu and Ravi Kanbur (eds.)]. Oxford University Press, Oxford.
b. **Schlosberg, David, and Lisette B. Collins. "From environmental to climate justice: climate change and the discourse of environmental justice." Wiley Interdisciplinary Reviews: Climate Change 5, no. 3 (2014): 359-374.
c. **Arrow, Kenneth, Maureen Cropper, Christian Gollier, Ben Groom, Geoffrey Heal, Richard Newell, William Nordhaus et al. "Determining benefits and costs for future generations." Science 341, no. 6144 (2013): 349-350.
d. **Hsiang, Solomon, Paulina Oliva, and Reed Walker. "The distribution of environmental damages." Review of Environmental Economics and Policy 13, no. 1 (2019): 83-103.
e. Stern, Nicholas. (2006). "Chapter 2 – Economics, Ethics, and Climate Change." Stern Review - Report on the Economics of Climate Change

Part III: Climate Policy Instruments in Theory and Practice (weeks 6-9)

6) An Introduction to Climate Policy Instruments

Topics: Mitigations and Adaptation, Emissions trading; Carbon pricing; Markets versus mandates; Cost-effectiveness; Political economy; Trade; Output and input taxes; Cap-and-trade

a. **Keohane, Mr Nathaniel O., and Sheila M. Olmstead. Markets and the Environment. Island Press, 2016. Chapters 5 and 8.
b. **Gillingham, Kenneth, and James H. Stock. 2018. "The Cost of Reducing Greenhouse Gas Emissions." Journal of Economic Perspectives, 32 (4): 53-72.
c. Goulder and Parry, "Instrument Choice in Environmental Policy." Review of Environmental Economics and Policy 2008.
d. Aldy, Krupnick, Newell, Parry, and Pizer, "Designing Climate Mitigation Policy." Journal of Economic Literature, 2010 Section 3.
e. Goulder "Markets for Pollution Allowances: What Are the (New) Lessons?" Journal of Economic Perspectives 27(1), Winter 2013.

7) National Climate Policies in Practice

Topics: Power; Renewable energy; Fracking;Transportation; Fuel and Energy efficiency; Marginal abatement curves; Energy access; Electrification; Energy policy in low income settings; "Energy ladder"; Innovation, technology; Research, development, and deployment; Renewable energy technology;

a. **Keohane, Mr Nathaniel O., and Sheila M. Olmstead. Markets and the Environment. Island Press, 2016. Chapters 9.
b. **Newell, R., et al. (2013). "Carbon markets 15 years after Kyoto: lessons learned, new challenges." Journal of Economic Perspectives, 27(1), 123-146.
c. **Ambec, Stefan, Mark A. Cohen, Stewart Elgie, and Paul Lanoie. "The Porter hypothesis at 20: can environmental regulation enhance innovation and competitiveness?." Review of environmental economics and policy 7, no. 1 (2013): 2-22.
d. Aldy, J.E. and W.A. Pizer (2009). Issues in Designing U.S. Climate Change Policy. Energy Journal 30(3). **read pages 179-191
e. Kellogg, Ryan. Output and Attribute-Based Carbon Regulation Under Uncertainty. No. w26172. National Bureau of Economic Research, 2019.

8) International Climate Policies in Practice

Topics: UNFCCC, Kyoto Protocol, Paris Accord; IPCC; Leakage; European Union Emissions Trading Scheme (EU-ETS); Climate and Development;Mitigation, Adaptation, and Loss and Damage;

a. **Barrett, Scott (2008) ”Climate treaties and the imperative of enforcement”, Oxford Review of Economic Policy.
b. **Bodansky et al. (2015). ”Facilitating linkage of climate policies through the Paris outcome” Climate Policy
c. **Victor (2015). Why Paris Worked: A Different Approach to Climate Diplomacy. https://e360.yale.edu/features/why_paris_worked_a_different_approach_to_climate_diplomacy
d. **Chan, Gabriel, Robert Stavins, and Zou Ji. "International Climate Change Policy." Annual Review of Resource Economics 10 (2018): 335-360.
e. **Aldy, J., B. Pizer et al. (2016). "Economic tools to promote transparency and comparability in the Paris Agreement". Nature Climate Change 6, 1000-1004.
f. Carbon Brief (2017) “Explainer: Dealing with the ‘loss and damage’ caused by climate change” https://www.carbonbrief.org/explainer-dealing-with-the-loss-and-damage-caused-by-climate-change

Remote Resources for Student Support

If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, remote counseling services are available. Student Counseling Service (SCS) urges you to attend to your mental wellbeing and to reach out to them for support during these challenging times. All SCS services are covered by the Student Life Fee, and there is no additional cost for students to access their services. See https://wellness.uchicago.edu/mental-health/student-counseling-service-spring-quarter-faq/. Students seeking new services/resources can call 773.702.9800 during business hours (Monday–Friday 8:30 a.m.–5 p.m.) and ask to speak with a clinician. Students needing urgent mental health care can speak with clinicians over the phone 24/7 by calling the SCS at 773.702.3625.

Ethical Academic Conduct

All University of Chicago students are expected to uphold the highest standards of academic integrity and honesty. Among other things, this means that students shall not represent another’s work as their own, use un-allowed materials during exams, or otherwise gain unfair academic advantage. All students suspected of academic dishonesty will be reported to the Harris Dean of Students for investigation and adjudication. The disciplinary process can result in sanctions up to and including suspension or expulsion from the University. In addition to disciplinary sanctions, a student will receive a grade of 0 on the assignment or exam in question (subject to the discretion of the instructor). The Harris policy and procedures related to academic integrity can be found at https://harris.uchicago.edu/gateways/current-students/policies. The University of Chicago Policy on Academic Honesty & Plagiarism can be found at https://studentmanual.uchicago.edu/academic-policies/academic-honesty-plagiarism/

Harris Integrity Policy for Problem Sets Involving Code

Note: This policy was developed by a committee of Harris faculty and is meant as a guideline. Individual instructors may make modifications to this policy in the context of his or her own class. Please see the course syllabus for rules relating to a particular course.

1. Academic dishonesty will not be tolerated. If you commit plagiarism, you may receive an F and be referred to the Area Disciplinary Committee.
2. All work must be your own. Do **NOT**
   - show other students your code
   - ask for another student's code
   - use online solutions to textbook questions
   - copy large portions of code from online repositories (e.g. replication code)
3. Every submission begins with "*this submission is my work alone and complies with the 57300 integrity policy. Add your initials to indicate your agreement: **___**"*
4. So how can I collaborate?
   a. In-person collaboration
      I. clarify ambiguities in problem set questions
      II. discuss conceptual aspects of problem sets (e.g. at the whiteboard)
      III. show output on screen (e.g. a graph or table)
      IV. show helpful documentation files
   b. Electronic collaboration
      I. Piazza message board
         - ask questions
         - share error messages (but not code)
      II. Code from an online forum or resource (other than documentation files)
         - cite all code you use, even a one-line snippet
5. How do these rules change for problem sets working in groups?
   a. You and your group members will submit a single problem set.
   b. If you work collaboratively with other students, but turn in your own problem set
      - You can talk to your group members as needed and look at other members work to facilitate that discussion
      - Your problem set should be solely your authorship (written up by yourself, in your own language, including your own code.)
      - Your code should have a comment at the top listing the members of your group.
      - any part of your code that was substantially altered because of your group discussion should cite others' contributions with names and descriptions in a comment at the place where it is applicable.
6. Unsure about some aspect of this policy? Please ask your instructor.

Please see example

source: This policy draws heavily on the CS 12100 academic honesty policy and CMSCC 23300 policy

Full Harris Academic Integrity Procedures
from online student Handbook accessible at https://harris.uchicago.edu/gateways/current-students/policies

Harris Procedures for Allegations of Plagiarism, Cheating, and Academic Dishonesty

First Violation

If a student is accused by an instructor or teaching assistant of plagiarism, cheating, or any other form of academic dishonesty, the student will be summoned to meet with the Dean of Students and the instructor. In the meeting, the student and instructor both present information about the situation. If it is determined by the instructor and the Dean of Students that the student has, in fact, plagiarized or cheated, the following sanctions will be imposed for the first violation:

- The student will generally receive a grade of 0 on the assignment or exam in question. Please note that grading decisions are fully at the discretion of the instructor, who may decide to impose harsher grade penalties.
- The student may be asked to re-do the assignment or retake the exam (without credit) to ensure that the student has learned how to properly cite sources or demonstrate that he or she has command of material covered.
- A formal letter of finding is sent to the student stating that the student has been found in violation of the code of academic honesty and what the sanctions were. The letter, along with any evidence presented, is archived in Harris Student Affairs records until the student graduates if the student has no other violations.
- Students found in violation of the academic honesty policy are not permitted to withdraw from the course to avoid grade penalties from the instructor.
- In cases where plagiarism or academic dishonesty is egregious, the case may be referred to the Area Disciplinary Committee even on a first offense. The Dean makes all decisions about which cases will go before the Area Disciplinary Committee.

Second Violation

If a student who has already been found in violation academic dishonesty is again accused of academic dishonesty, the case will be sent to the Harris Area Disciplinary Committee. Details about the Area Disciplinary Committee procedures can be found in the University Student Manual. Information about the first violation, including the formal letter of finding any evidence, will be presented to the Area Disciplinary Committee, along with evidence of the current allegation. If the student is found in violation of academic honesty a second time, the Area Disciplinary Committee can assign sanctions including transcript notes, disciplinary probation, suspension or expulsion from the University.

Academic Dishonesty Appeals

If a student has been found in violation of academic honesty and does not believe that either the finding or the sanction is fair or correct, the student has the right to appeal the finding by requesting a hearing from the Area Disciplinary Committee. More information about the Area Disciplinary Committee is available here.

University of Chicago Policy on Academic Honesty & Plagiarism

https://studentmanual.uchicago.edu/academic-policies/academic-honesty-plagiarism/