

ECON 482: Advanced Topics in Environmental Economics

Fall 2022

Instructor: Dr. Zoë Plakias ([link to my website](#))

Schedule: T/Th 12-1:50 PM

Location: Interdisciplinary Sciences 244

Modality: Face-to-face

Student drop-in hours in 313 Parks Hall: M/Th 2-3 PM (no RSVP needed!)

One-on-one meetings: By appointment (schedule at: www.calendly.com/plakiaz)

Official Course Description

Examines an extended set of applications in environmental economics, with a focus on deepening the student's understanding of the field. Applications involve current controversies in environmental policy and management, as well as methodological issues. Topics include climate change, ~~solid waste management and recycling, water quality, and other issues of current interest.~~

Prerequisites: ECON 383 or equivalent

Credits: 4

Grade Mode: Letter

Designation: Writing Proficiency (WP) 3

Learning Goals (adapted slightly from [Lewis and Wichman \(2021\)](#))

Upon completion of this course, students will be able to:

- *Understand* the (basic) science behind human-induced climate change along with the uncertainties involved;
- *Understand* the basics of risk and uncertainty, including tipping points, fat tails, and catastrophic risk, and be able to communicate the meaning of those terms;
- *Demonstrate* the ability to interpret the measurement of climate change damages;
- *Recognize* the equity implications of various climate change impacts;
- *Perform* (basic) benefit-cost analysis and exhibit proficiency with discounting;
- *Utilize* sensitivity analysis to account for fat tails, accelerated timing, and different discount rates;
- *Recognize* the limitations of benefit-cost analysis and integrated assessment models for low probability, high impact events and the normative decisions involved with choosing a discount rate;

- *Be comfortable applying* the Social Cost of Carbon to estimate the impacts of a policy change, especially for the estimation of benefits of reducing climate pollution;
- *Understand* the differences between adaptation and mitigation policy and that both are necessary;
- *Analyze* policy recommendations using knowledge about instrument choice and recognition of the distributional and equity impacts.
- *Evaluate* adaptation strategies;
- *Understand* the rationale for and analyze the implications of government intervention as a potential solution to market failures and global externalities;
- *Recognize* the importance and analyze the implications of international cooperation in achieving global solutions to climate change;
- *Evaluate* policy instruments using evidenced-based reasoning.

Grading

Reading log - 20% total

Final paper - 40% total

In-class “Doing Economics” projects (x2) - 20% total

Other in-class exercises - 20% total

Grading Scale

A	93-100%	C	73-76.99%
A-	90-92.99%	C-	70-72.99%
B+	87-89.99%	D+	67-69.99%
B	83-86.99%	D	63-66.99%
B-	80-82.99%	D-	60-62.99%
C+	77-79.99%	F	0-59.99%

What to expect from this class

You can expect lots of discussion! The science, economics, and policy of climate change is evolving on a daily basis. We have far from all of the answers. And climate change will affect all of us as humans. So we'll be discussing things a lot, and I expect you to be prepared for those discussions.

You can expect opportunities to steer your learning in ways that interest you! I want your input on this class as we go, and there will be multiple points where you can choose from a list of reading or topics to steer your learning in ways that interest you!

What not to expect from this class

Don't expect slides! We'll be in an active learning classroom in the new interdisciplinary sciences building, and I plan to make full use of it. I'll use the white board and screens for presenting some concepts, but I'll expect you to take notes on our discussions. If that's not something you're used to, I'm happy to discuss good note-taking strategies. Also, here's a [nice overview](#) of some different ways to take notes and key things to think about.

Course materials

There is no required textbook for this course. All readings will be available either as a PDF in Canvas or via a link to the library website.

Assignments

Reading log (contributes to WP3 designation)

This course will be heavily discussion based. To have good discussions, you will need to do the reading. Early on in class we'll read an economic paper and discuss how to make reading them a little less scary. I will assign no more than one paper per class period. To ensure enough folks have done the reading so we can have a vibrant discussion, I will ask you to keep a reading log. We'll read 12 papers in the class, and you'll have to read at least 9 for full credit for the reading log. That means you can skip 3. Why? Because we're all human and have rough weeks. There's no need to tell me when you'll skip a reading—we'll just hope not everyone chooses the same day to skip the reading and I'll count up at the end of the term to make sure you have met the requirement! I do encourage you not to use up all these "free days" in the beginning of the term, though, as you might regret it later.

Reading log requirements

For each paper you read for class, write a short narrative (2-3 paragraph) summary of the reading that includes a brief description of the following elements:

- The type of document
- The research questions
- The (stated) importance of the document to the literature and the world
- The methods used and any data used
- The main findings
- 1-2 questions, concerns, or comments you have about the work to bring to our discussion (this is the only point where your opinion should come in!)

How to submit: Submit your summary via the Reading Log discussion board I've created for each of you *before* the start of class the day the reading will be discussed. Late assignments will not be accepted, as the whole point is to discuss it in class!

Grading: Reading logs will be graded as satisfactory or unsatisfactory, and I will provide brief feedback. It's my hope/expectation that everyone can easily receive a satisfactory grade. However, an unsatisfactory grade is likely if you (a) don't appear to have read the paper, (b) simply copy and paste or lightly reword the abstract (that's plagiarism), and/or (c) don't address feedback I provided in past reading log submissions. Here's a [short tutorial](#) (just 10-15 minutes) from the library to help you learn how to avoid plagiarism.

Final paper (contributes to WP3 designation)

In this course, you will be required to write a term paper. You will have opportunities to (and will be expected to!) work on this paper throughout the quarter. The paper will focus on a single existing or proposed climate change mitigation strategy or adaptation strategy, the benefits and costs of the strategy as stated by advocates, and the evidence for the economic and climate impacts of the strategy. It can be a voluntary strategy engaged in by businesses or governments, or a government policy that is mandatory once enacted. See Final Paper Assignment document in Canvas for additional details on this.

In-class "Doing Economics" projects

These projects are both opportunities to dig into data and learn the practice of economics (as in, what you do if you're a professional economist at some level). They have been developed by [Core Econ](#). We'll spend two class periods working on each of them in class and you'll have another week and a half to finish them on your own and submit your completed work. They're not about getting the right answer (in fact, I'll tell you now that the answers are in the "back of the book," so to speak) but rather about learning how to get to those answers! You will need to bring a laptop or tablet to class to do this work! If you don't have one, e-mail me, and we'll see if we can schedule computer lab time instead.

Grading: Projects receiving full credit will: (a) answer all of the questions (I may change the scope of these if they seem like too much to cover in our timeframe), (b) demonstrate correct use and understanding of the program you're using (Excel, Google Sheets, or R), (c) demonstrate correct understanding of economic concepts, and (d) be written in your own words.

Other in-class exercises

Throughout the term I will have in-class exercises for you to complete. Many of these we'll work on together. Some will be individual. I will generally grade these for completion (you did or didn't do it) as opposed to whether it's correct or not. While I do not take attendance and don't believe in policing students (we're all humans with needs and adults who can make our own decisions), you will miss out on 20% of your grade if you do not come to class. For medical situations or other necessary absences, please check in with me about any opportunities for in-class credit you may have missed so I can ensure you have an opportunity to make it up. Also, I ask you to please not take advantage of this policy, as it creates more work for me and decreases the quality of our class engagement if we have a lot of absences.

Course policies

I will follow all of the standard WWU policies listed at Syllabi@WWU. This website covers policies on COVID-19 safety; academic honesty; accommodations; ethical conduct with WWU resources; equity, equal opportunity, and civil rights; finals week; medical excuse policies; and the student code of conduct. In addition, I have adopted [Lauren's Promise](#). I promise to: (1) Listen and believe you if someone is threatening you, (2) Represent a safe haven for sharing incidents of sexual assault, domestic violence, or stalking, and (3) Change campus culture that responds poorly to dating violence and stalking.

Your well-being

Your well-being is very important to me. I am in therapy and take medication for depression and anxiety, and this is something I struggled with in college. I am constantly working (it's not easy!) to get enough sleep and exercise and to eat well, and to manage my time well. COVID-19 continues to affect all of us as well, and I know that transitioning back from online has been challenging. I encourage you to reach out to me if you are struggling with coursework or other things in your life that are affecting your ability to engage in class so that we can discuss strategies that might help and I can direct you to relevant resources at Western. The sooner you talk to me, the better!

E-mail

I will do my best to respond to e-mail in a timely manner. You can message me through Canvas or e-mail me at plakiaz@wwu.edu. You can expect an answer within 24 hours on a weekday, and usually a weekend as well (if the request is urgent—e.g., for an assignment due on Sunday). Please do not expect an immediate response to e-mails, although I will provide these occasionally if I'm online when I receive your message.

Student Drop-in Hours and One-on-One Meetings

Student drop-in hours are times I promise to be in my office (Parks Hall 313) and available for you to drop-in and chat. You do not need to RSVP or tell me you're coming. We can talk about a question related to class (takes priority), further discuss a topic from class, or chat about whatever. For those wishing to chat one-on-one (not assured for drop-in hours, since multiple people might drop-in), I am available for one-on-one chats in person or via Zoom (times vary for the two options—if I am not available in person, I might still be available on Zoom for the same time). You can schedule with me at: www.calendly.com/plakiaz.

Plan for the Term (subject to change)

Week 1 (Thursday only)

Topics: Introductions, syllabus discussion and questions (part 1), concept and knowledge review

Reading: None

Assignment (due Sunday at 11:59 PM): Getting to know you survey!

Complete the short survey in Canvas to help me learn a little bit about you. Credit (for completion—there are no “right” answers to this quiz) will go toward your in-class exercise grade.

Week 2: Concept Review + Key Skills

Tuesday

Topics: Syllabus discussion and questions (part 2), reading an economic paper

Reading (does not contribute to reading log): [Lee \(2017\)](#)

Thursday

Topics: More review of economic concepts, reading discussion

Reading: [Stern \(2022\)](#) or [Nordhaus \(2019\)](#)

Assignment (due Sunday at 11:59 PM): Submit a paper topic proposal for final paper
See Final Paper Assignment document in Canvas for additional details on this.

Week 3: Measuring Climate Change

Tuesday

Topics: measuring climate change vs. measuring impacts of climate change, linearity vs. non-linearity, tipping points, uncertainty, reading discussion, begin in-class project ([Doing Economics 1 - Measuring Climate Change](#))

Reading: [Hsiang and Kopp \(2018\)](#)

Thursday

Topics: Continue in-class project ([Doing Economics 1 - Measuring Climate Change](#))

Reading (does not contribute to reading log): [NYT \(2021\)](#)

Week 4: Methods in Economics for Measuring the Impacts of Climate Change

Tuesday

Topics: Methods introduction and concepts, including benefit-cost analysis, discounting, and uncertainty

Reading: [Zerbe and Scott \(2015\)](#)

Thursday

Integrated assessment models

Social cost of carbon

Reading: [Metcalf and Stock \(2017\)](#) or [Rennert et al. \(2022\)](#)

Assignment (due Sunday at 11:59 PM): Turn in finished in-class project from prior week (one per student, although you may work together outside of class). Submit all documents or links to documents containing your work (Excel, R, or Google Sheets). Submit a separate Word document with your answers to the discussion questions. Summarizing class discussion (in your own words) for things we discussed in class is totally fine!

Week 5: Methods in Economics for Measuring the Impacts of Climate Change

Tuesday

Topics: Marginal damage functions, linear regression, econometric estimation of damages

Reading: [Aufhammer \(2018\)](#)

Thursday

Topics: Tuesday topics continued, additional critical perspectives on climate models

Reading: [Pindyck \(2017\)](#) or [Keen \(2021\)](#)

Assignment (due Friday at 11:59 PM): Submit an annotated bibliography
See Final Paper Assignment document in Canvas for additional details on this.

Week 6: Economic Impacts of Climate Change

Tuesday

No class today (I'll be at a conference)

Note: This would be a good time to prepare for Thursday's reading discussion. You're welcome to use our usual classroom as a workspace!

Thursday

Topics: Types of impacts from climate change and how they are estimated, sign of impacts, equity/distribution of impacts, reading discussion

Reading (reading log required!): Use your library research skills to locate a paper that talks about the *impacts* of climate change on a specific sector or group that interests you. Examples: Recreation, transportation infrastructure, maritime infrastructure, crime, marine fisheries, agriculture, food security, labor conditions, gender. Be prepared to share out during class some of the highlights from the reading. To the extent you speak to your classmates, don't *intentionally* choose the same paper as them.

Week 7: Economic Impacts of Climate; Climate Change Adaptation + Mitigation

Tuesday

Topics: Climate adaptation, mitigation, and engineering intro; valuation methods; reading discussion; begin in-class project ([Doing Economics 11 - Measuring WTP for Climate Change Mitigation](#))

Reading: [Kling et al. \(2012\)](#)

Thursday

Topics: Continue in-class project ([Doing Economics 11 - Measuring WTP for Climate Change Mitigation](#))

Reading: None

Week 8: Climate Change Adaptation + Mitigation

Tuesday

Topics: Adaptation, mitigation, and engineering; mitigation of climate change (climate policy, voluntary practices, climate engineering)

Reading for Tuesday: [Masseti and Mendelsohn \(2018\)](#) or [Castells-Quintana et al. \(2018\)](#) or [Fawzy et al. \(2020\)](#)

Thursday

Topics: Cap and trade, economics of auctions

Reading: [Schmalensee and Stavins \(2017\)](#)

Assignment (due Sunday at 11:59 PM): Turn in finished in-class project from prior week (one per student, although you may work together outside of class). Submit all documents or links to documents containing your work (Excel, R, or Google Sheets). Submit a separate Word document with your answers to the discussion questions. Summarizing class discussion (in your own words) for things we discussed in class is totally fine!

Week 9: Climate Policy

Tuesday

Topics: Carbon taxes and cap-and-trade

Reading: [Goulder and Schein \(2013\)](#)

Thursday

Guest speaker (Derek Nixon)

Assignment (due Sunday at 11:59 PM): Turn in full first draft of paper!
See Final Paper Assignment document in Canvas for additional details on this.

Week 10 (Tuesday only): Climate Policy

Tuesday

In class: 5-minute presentation!

Reading: None

Week 11: Climate Policy (cover these topics only if time!)

Tuesday

Topics: International agreements, governance and cooperation, game theory, Nash equilibrium

Reading: [Keohane and Victor \(2016\)](#) or [Ostrom \(2009\)](#)

Thursday

Topics: Wrap-up day

Reading: None

Finals week

Assignment (due Friday at 11:59 PM): Final paper due!

See Final Paper Assignment document in Canvas for additional details on this.