Syllabus

Econ 57a, Environmental Economics, Fall 2020
Lecture: Monday / Wednesday 4:00-5:30 pm Eastern Standard Time (GMT -4)
Location: Link Here, or manually at https://brandeis.zoom.us/j/3579158444 Passcode: econ57
Check-ins: TBD

This is a tentative version of the syllabus, and is subject to change without prior notification.

Instructor: Prof. Xinde “James” Ji
Email: xji@brandeis.edu
Virtual Office Hours: Monday / Wednesday 10:00 - 11:30 am, or by appointment
Location: Link Here, or manually at https://brandeis.zoom.us/j/3579158444

Disclaimer: Email is the preferred communication mechanism, and I promise to respond to your email within 24 hours (48 hours on weekends). Using alternative communication media (instant messaging) does not guarantee a faster response.

Teaching Assistant: Jacob Margolis
Email: jjmargolis@brandeis.edu
Office Hours: Monday/Thursday 12:30-13:30 pm
Location: Link Here, or manually at https://brandeis.zoom.us/j/91703352041

Course materials will be posted on LATTE, as well as on my personal website, link here

Teaching Modes

In light of public health concerns, this class is taught online only. Synchronous class sessions will run on Monday/Wednesday 4:00-5:30 pm Eastern Time. Video recordings of lectures will be posted shortly after each class session. You are FREE to choose between attending synchronous sessions or watch video recordings asynchronously. Whichever your choice, I will ensure that your learning outcomes are equally and fairly evaluated.

That said, you are encouraged to attend synchronous sessions if you are able to do so. There are at least several reasons:

1. The learning process of this class will be based on a series of discussions and conversations between us, and between you and your peers. Attending synchronous sessions is the easiest way to have such discussions.
2. The same amount of time, effort, and critical thinking are expected for synchronous and asynchronous learning. You still need to invest heavily in this class in order to earn a successful grade with asynchronous learning.
3. A higher bar will be expected for lecture reflection questions (see the assignment section for details) if it is completed outside of the synchronous session.

Virtual Check-ins If you cannot join synchronous class sessions regularly, you will be asked to attend periodic check-ins with me or the TA, at a time that is convenient to all of us. The exact time of the check-ins will be determined at the second week of the semester.
Overview

How much is an endangered species worth? Are we going to run out of fuel in the next 50 years? How damaging is climate change, and how should we deal with it? Why are so many fisheries over-exploited, forests cut down, aquifers depleted, and are there ways to prevent that?

Human society is intrinsically connected with nature. This course aims to provide an introduction to the economics regarding natural resources and the environment. In the first part of the course, we will talk about how economists think about environmental and resource problems from methodological and analytical perspectives. Topics include market failures and policy instruments to correct them, property rights, and ways to evaluate benefits and costs of protecting the environment. In the second part of the course, we will dive into specific real-world environmental problems and analyze them using economics methods and tools. Topics will include non-renewable resources, air, water, climate, and others.

Learning goals

There are four learning goals that I hope you will be able to grasp by the end of this course.

1. Know the facts (not the alternative facts or the rhetorics)
   - How damaging will climate change be on our society?
   - How much jobs will be lost by phasing out fossil fuel in the next 10 years?
2. Know the concepts of which economists think of environmental problem
   - What is the Coase theorem?
   - What is scarcity rent?
3. Develop skills to think logically, critically, and coherently
   - Graphically show how to correct externality using the tax instrument
   - Apply the equi-marginal principle to the case of freshwater allocation
4. Develop an economic mindset that can be applied to analyze real-world environmental problems
   - What are the trade-offs associated with protecting wildlife in Madagascar?
   - What is the best way to do so?

Prerequisites

Students are expected to have knowledge of microeconomics at the level of Econ 2a (A Survey of Economics) or Econ 10a (Intro to Microeconomics). I will assume that you have basic knowledge regarding supply and demand, consumer and producer surplus, opportunity cost, etc. Please come to see me if you are not sure you meet the prerequisite of the course.

Textbook

Required
The textbook is available for purchase at the Brandeis Bookstore.

Optional

Readings
Additional readings will be posted on LATTE.
Grading

1. Thoughts and Questions (10%)
   A collection of readings will be assigned for each module. Please read them and reflect on the following question, unless otherwise specified:
   **What did you find most challenging, confusing, or noteworthy about the reading?**
   - You get 1 point for each TQ you submit, as long as it is a good-faith effort.
   - TQ is due by 10 pm on the day before we start a new module.
   - I will drop the lowest two TQ scores.

2. Class Reflections (10%)
   During some class sessions, you will be asked a reflection question. You could either answer it synchronously during the session, or asynchronously after watching the session recording.
   - You get 1 point for each CR you submit, as long as it is a good-faith effort.
   - The bar for “good-faithness” is slightly higher for CRs submitted outside of synchronous class time.
   - I will drop the lowest two CR scores.

3. Problem Sets (15%)
   - There will be ~6 assignments throughout the semester.
   - Problems will be posted on Wednesday, and is due on the next Wednesday before class (4 pm). I accept late assignments, though it reduces your grade by 10% each day.
   - All the assignments are individual unless otherwise stated.

4. Group Project (20%)
   - See instructions below

5. Midterm Exam (20%)
   - Time TBD
   - Open book, open notes

6. Final Exam (25%)
   - Time TBD
   - Open book, open notes
   - The exam will focus on the second half of the class, though you are expected to be able to apply concepts and tools covered in the first half of the class.

Instructions on the Group Project

You are expected to work on the project in a group of 4 students. I will provide a list of problems / issues you can work on, but feel free to propose your own topic as long as it is related to an environmental or resource issue. The final products will be a ~10 minutes class presentation and a paper around 8 pages, not including references but everything else.

Think of your paper as an attempt to address an environmental or natural resource issue as an economist: describe the issue; analyze the issue using an analytical or quantitative framework; and offer your conclusion or suggestion. It is not expected that your paper be the last word on the topic or be entirely comprehensive. The point of the paper is for you to learn in greater detail about a particular topic, to think through the trade-offs associated with the problem, to make an argument, and to defend that argument using economic logic.

The paper is expected to be academic, i.e. not a collection of opinions from blogs and websites. You are expected to use information from credible sources, for example refereed journal articles, research reports, and governmental agencies such as the EPA, DOE, and CBO, etc. Make sure you include those references at the end of your paper.

The grade for the group project will be based on both the presentation and the paper itself, applying to all group members. Detailed grading rubrics will be posted later in the semester.
Class Policies

Attendance While participation in synchronous sessions is encouraged, there are no attendance requirement for this class.

Equipments We will be using interactive Zoom for lectures, office hours, and check-ins. All other class-related materials will be posted on LATTE. You will need the following equipment to succeed in this course:

• A personal computer (necessary)
• Access to LATTE, Zoom, and Brandeis Email (necessary)
• Reliable internet service (recommended)
  – Alternatively, reliable access to cellular data
• Virtual Private Network (VPN, recommended if you join us from China)

Please contact Student Financial Services to discuss options available to purchase equipment and other technology and supply needs.

Video Recordings All synchronous class sessions, if not otherwise indicated, will be recorded for educational purposes. You may decline to be recorded; if so, please contact me to identify suitable alternatives for class participation. These recordings will be deleted within two months after the end of the semester. If you can be personally identified in a recording, no other use is permitted without your formal permission. You may not record classes on your own without my express permission, and may not share the URL and/or password to anyone unaffiliated with this course. Your behavior in these recordings, and in this class as a whole, must fulfill Brandeis standards:

Brandeis University is committed to providing its students, faculty and staff with an environment conducive to learning and working, where all people are treated with respect and dignity. You must refrain from any behavior toward members of our Brandeis community, including students, faculty, staff, and guests, that intimidates, threatens, harasses, or bullies.

Academic Honesty Every member of the University community is expected to maintain the highest standards of academic integrity. A student shall not submit work that is falsified or is not the result of the student’s own effort. Infringement of academic honesty by a student subjects that student to serious penalties, which may include failure on the assignment, failure in the course, suspension from the University or other sanctions (see section 20 of Brandeis University Rights and Responsibilities). Please consult Brandeis University Rights and Responsibilities (see https://www.brandeis.edu/studentlife/srcs/rightsresponsibilities/index.html) for all policies and procedures related to academic integrity. Students may be required to submit work to TurnItIn.com software to verify originality. A student who is in course or assignment should consult the faculty member responsible for that course or assignment before submitting the work. Allegations of alleged academic dishonesty will be forwarded to the Department of Student Rights and Community Standards. Citation and research assistance can be found at Brandeis Library Guides - Citing Sources (https://guides.library.brandeis.edu/c.php?g=301723).

Accommodations Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, please reach out me and present your letter of accommodation as soon as you can. I want to support you.

In order to provide test accommodations, I need the letter more than 48 hours in advance. I want to provide your accommodations, but cannot do so retroactively. If you have questions about documenting a disability or requesting accommodations, please contact Student Accessibility Support (SAS) at 781.736.3470 or access@brandeis.edu.

Important Dates

• 8/26 First day of class
Course Outline

Note: the course outline is alive and breathing, so it may evolve spontaneously as the course goes along.

1. Why Environmental Economics?
   • Why Adam Smith is not entirely correct
   • The need for environmental economics
   • The current state of business
     Readings: Fullerton and Stavins (1998); Boyle and Kotchen (2018); McCarthy (2019)

2. The Efficiency Standard
   • The demand
   • The supply
   • The equi-marginal principle
     Readings: Keohane and Olmstead Chapter 2 (pp 11-30); Aldy (2020)

3. When Do Markets Fail
   • Externality
   • Property rights
   • The open-access problem
   • The public good problem
     Readings: Keohane and Olmstead Chapter 5; Hardin (1968)

4. How to Correct Market Failures
   • Command and control regulation
   • Pigovian taxes
   • Subsidies
   • Coase theorem, cap and trade
   • Policy instruments under uncertainty
   • Ostrom, common-pool resources
     Readings: Keohane and Olmstead Chapter 8; Ronald Coase and the Misuse of Economics (New Yorker); Ostrom (2009)’s Nobel Prize Press Release

5. Command-and-Control vs. Market-based Policy
   • Cost-effectiveness
   • Innovation
   • The US Sulfur Trading Scheme
   • Do we ever prefer command-and-control?
     Readings: Keohane and Olmstead Chapter pp 168-184; Keohane and Olmstead pp 200-207; The Invisible Green Hand (The Economist)

6. Measuring Benefits
   • Estimating causal effects
   • Estimating dollar values
   • Stated preference
   • Revealed preference
     Readings: Goodstein and Polasky Chapter 5; EPA Plans to Revisit a Touchy Topic
7. Measuring Costs
   • Engineering vs. opportunity cost
   • Measuring social welfare losses
   • Who bears the cost?
   • Employment
   • Innovation
   Readings: Keohane and Olmstead pp. 35-40, 43-44; Give me green, and jobs, but not green jobs (the Economist); Why Green Energy Can't Power a Job Engine (NYTimes)

8. Benefit-cost Analysis and Dynamic Efficiency
   • Criteria for evaluating programs
   • Discounting and present value
   • Dynamic decision-making
   • Decision under uncertainty
   Keohane and Olmstead pp. 55-62; Goodstein and Polasky pp 146-150; Cunningham (2009)

9. Non-renewable Resources
   • The two-period problem
   • The infinite horizon problem
   • Hotelling’s rule
   • The Simon-Erlich bet
   Readings: Tietenberg and Lewis pp 107-116; Betting on the Planet (NYTimes)

10. Water
    • Who owns the water?
    • The economics of water resources
    • Water transfers
    • When will we run out of water Tietenberg and Lewis pp 197-207; West's Drought and Growth Intensify Conflict Over Water Rights (NYTimes)

11. Climate Change
    • The economic consequence of climate change
    • Measuring benefits and costs
    • Policy instruments: tax, cap, and the clean power plan
    • Global agreements

12. Environment and Economic Development
    • Development and the environment
    • The Kuznets Hypothesis
    • Environmental governance and politics in the developing world