Syllabus
Econ 57a, Environmental Economics, Fall 2019
Lecture: Tuesday / Friday 11:00-12:20, Mandel Center for Humanities G12
Instructor: Prof. Xinde “James” Ji
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Office Hours: Tuesday / Thursday 2:00 - 4:00pm, or by appointment
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Office Hours: Monday 4:00 - 5:00pm, Thursday 2:00 - 3:00pm, or by appointment
Location: Library by the printers
Course materials will be posted on LATTE, as well as on my personal website, https://sites.google.com/site/xindejamesji/teaching/environmental-economics

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 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 for 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 wildlifes 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 as the class goes along.

Grading

1. Thoughts and Questions (10%)
   I will assign a collection of readings 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.
   - You only need to submit 8 TQs over the course of the semester. You get an additional 2 points automatically after you have done 8 TQs.
   - TQ is due by 10 pm on the day before we start a new module.

2. Problem Sets (20%)
   - Problems will be posted on Tuesday, and is due on the next Tuesday before class (11 am). I accept late assignments, though it reduces your grade by 20% each day.
   - All the assignments are individual unless otherwise stated.

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

4. Midterm Exam (25%)
   - 10/22, in class
   - Closed book, calculator allowed

5. Final Exam (25%)
   - Time TBD
   - Closed book, calculator allowed
   - The exam will focus on the second half of the class, though students are expected to be able to apply 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.

Groups will be assigned on 9/17 based on your background and interests. To help you get started and stay on track, a one-page project proposal is due on 11/1. The group presentations will be held on the last several classes of the semester. The final paper is due electronically on 12/10.

Class Policies

Attendance

Attendance will not be tracked and you are not required to inform the instructor when you will miss a class. Please find out (either from the instructor or another student in the class) what you missed and get the relevant notes.

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/sres/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).

Cell Phone and Laptop Policy

The use of cell phones in class is not allowed. Please turn your cell phone off or put it on vibrate during lecture. Laptops may not be used in class unless otherwise instructed.

Accomodations

Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, please talk with 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

- 9/11 Last day to add classes
- 9/17 Group project member assigned
- 10/1 Rosh Hashanah (No class)
- 10/15 Brandeis Monday (No class)
- 10/22 Mid-term exam
- 11/1 Group project proposal due
- 11/27-11/29 Thanksgiving holiday
• 12/2, 12/6 Group project oral presentation
• 12/10 Group project due
• TBD Final exam

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 equimarginal principle
     Readings: Keohane and Olmstead Chapter 2 (pp 11-30); Do you think like an economist (LA Times)

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; The Invisible Hand (The Economist);
     Ronald Coase and the Misuse of Economics (New Yorker); Ostrom (2009)’s Nobel Prize Press Release

5. Measuring Benefits
   • Estimating causal effects
   • Estimating dollar values
   • Stated preference
   • Revealed preference
     Readings: Goodstein and Polasky Chapter 4

6. Measuring Costs
   • Engineering vs. opportunity cost
   • Measuring social welfare losses
   • Who bears the cost?
   • Employment
   • Innovation
     Readings: Goodstein and Polasky Chapter 5

7. Benefit-cost Analysis and Dynamic Efficiency
   • Criteria for evaluating programs
   • Discounting and present value
   • Dynamic decision-making
   • Decision under uncertainty
Readings: Tietenberg and Lewis Chapter 3

8. Non-renewable Resources
   • The two-period problem
   • The infinite horizon problem
   • Hotelling’s rule
   • The Simon-Erhlich bet

Readings: Keohane and Olmstead Chapter 6

9. Water
   • Who owns the water?
   • The economics of water resources
   • Water transfers
   • When will we run out of water

10. Air
    • The economic cost of air pollution
    • Mandates, cap-and-trade, and innovation

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