ECONOMICS OF CLIMATE CHANGE AND ENVIRONMENTAL POLICY
Monday, Wednesday, & Friday, 1:15-2:30 PM, Starr Auditorium (Belfer Room 200)
SYLLABUS

Nature and Purpose of the Course:

This course provides a survey of public policy issues regarding the management of natural resources and the protection of environmental quality, from the perspective of economics. The course covers both conceptual and methodological topics and recent and current applications. A significant portion of the latter half of the course focuses on global climate change policy.

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Teaching Fellows:

Daniel Stuart, Ph.D. Student, Public Policy (Head Teaching Fellow)
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or by appointment

Prerequisites: One course in microeconomic theory, or permission of the instructor; an introductory course (such as Social Analysis 10, P-125, API-101, or M-221) is adequate preparation. Students should be familiar with basic economic concepts, such as: supply & demand functions, consumers' surplus, opportunity cost, marginal analysis, and time discounting. It may be helpful to review an introductory microeconomics textbook.

Registration:

IMPORTANT: Unless you are a Kennedy School student you must register for ECON 1661, not API-135; this applies to Harvard undergraduates and all non-Kennedy School graduate students (e.g. HLS, MIT, Tufts, etc).
Reading Material:

There are two required books for the course — one text and one volume of selected readings:


Here is a link to two books at the Harvard Coop Bookstore: https://tinyurl.com/300-W20-ECON-1661-1

The Keohane & Olmstead textbook (*Second Edition*) provides a concise yet comprehensive treatment of the topics covered in this course. This book is available for purchase at the Harvard Coop, and is on reserve at the Kennedy School Library, on the ground floor of the Littauer Building. Students who would like a more detailed treatment of the material may consider also purchasing *Environmental and Natural Resource Economics* (Thomas Tietenberg & Lynne Lewis). A more rigorous mathematical treatment of the material, beyond the level required for the course, is found in *Environmental Economics* (Charles Kolstad).

The second required book for the course is the *Seventh Edition* of *Economics of the Environment*. This is available at the Harvard Coop for purchase, and is on reserve at the Kennedy School Library, on the ground floor of the Littauer Building. Students **should not** purchase previous editions, as many readings covered were not included in previous editions.

Extensive use will be made of other materials, particularly handouts of slides that are used in each class. These additional materials should be downloaded from the course web site and printed in advance of respective classes, because laptops and other electronic devices may not be used during class (see the NYTimes for an explanation). A few additional readings found in the reading list below are available for downloading at indicated web sites. The course web site is: https://canvas.harvard.edu/courses/70676

Course Requirements and Grading:

We will meet for a total of 25 class sessions. There will be: five problem sets (due at the beginning of class on February 19, March 2, March 30, April 13, and April 27); an in-class midterm exam (March 9); and an "in-class" (closed book) final exam during exam period. The final examination is scheduled by the Faculty of Arts and Sciences; the date and time of the exam will be announced by FAS later in the semester. Late problem sets will be penalized by a grade adjustment.

**IMPORTANT:** Classes are held on most **Mondays, Wednesdays, and some Fridays, 1:15-2:30 PM**, in Starr Auditorium (Belfer-200) at the Harvard Kennedy School. There will be no course meetings during the HKS shopping period. Please see the schedule on the next page. Also, note that some of the Monday or Wednesday classes may be cancelled in advance, and Friday classes added to make up for these. Therefore, enrolled students should be available for the class times on all three days each week.

The Teaching Fellows will conduct optional review sessions on specific topics. These review sessions will generally take place on Fridays in Starr Auditorium.

The exact schedule of classes, with topics and readings, is found on subsequent pages of the syllabus.
Here is a schematic of the schedule of mandatory lectures (bold) and optional sections (italics):

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<th>Monday, 1:15-2:30 pm</th>
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<td>February 3</td>
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<td>March 2</td>
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<td>Section: March 6</td>
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<td>March 9 (Midterm Exam)</td>
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<td>(Spring Break, March 16-20)</td>
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Course grading is on the following basis:

- Problem Sets: 15%
- Midterm Exam: 35%
- Final Exam: 50%
- Total: 100%

Academic Integrity:

Students are expected to abide by all University policies on academic honesty. While study groups are encouraged, each student must write up and submit his or her own problem sets.
API-135/ECON 1661
ECONOMICS OF CLIMATE CHANGE AND ENVIRONMENTAL POLICY

COURSE OUTLINE

I. INTRODUCTION AND OVERVIEW – Jan 27

II. PRINCIPLES AND METHODS

A. Fundamentals
   1. Net Present Value Analysis – Jan 29 & Feb 3 & 5
   2. The Costs and Benefits of Environmental Policies - Feb 10

B. Environmental Benefit Estimation Methods
   1. Revealed Preference I: Recreation Demand Models - Feb 12
   2. Revealed Preference II: Hedonic Pricing & Averting Behavior - Feb 12
   3. Stated Preference and Benefit Transfer – Feb 19 (Problem Set #1 Due)

III. NATURAL RESOURCE ECONOMICS AND POLICY

A. Nonrenewable Resources
   1. Optimal Extraction & Use of Nonrenewable Natural Resources – February 26
   2. Markets, Market Failure, and Public Policy – March 2 (Problem Set #2 Due)

B. Renewable Resources: Common-Property Problems – March 4

(Midterm Examination: March 9)

IV. ENVIRONMENTAL ECONOMICS AND POLICY

A. Economics of Pollution Control: An Overview – March 23, 25 & 27

B. Local Air Pollution – March 30 (Problem Set #3 Due)

C. Acid Rain – April 1

D. Global Climate Change

   1. Overview and National Climate Policy – April 6, 8, & 13 (Problem Set #4 is Due April 13)

   2. International Climate Policy – April 15, 20, & 22

E. Trade, Growth, and the Environment (Professor Frankel) – April 27 (Problem Set #5 is Due)

F. Global Climate Change (Concluded) – April 29
ECONOMICS OF CLIMATE CHANGE AND ENVIRONMENTAL POLICY

READING LIST

Readings should be completed prior to class sessions, with selections read in the order listed.


JANUARY 27: INTRODUCTION AND OVERVIEW

TEXT, pp. 11-34, 80-90: Chapter 2 "Economic Efficiency..." and Chapter 5 "Market Failures...", through the "Public Goods" heading


JANUARY 29 & FEBRUARY 3 & 5: NET PRESENT VALUE ANALYSIS

TEXT, pp. 35-68: Chapter 3: “The Benefits and Costs..."


FEBRUARY 10: THE COSTS AND BENEFITS OF ENVIRONMENTAL POLICIES

TEXT, pp. 69-78: Chapter 4, “The Efficiency of Markets”


FEBRUARY 12: REVEALED PREFERENCE I: RECREATION DEMAND MODELS & REVEALED PREFERENCE II: HEDONIC PRICING & AVERTING BEHAVIOR

FEBRUARY 19: STATED-PREFERENCE (CONTINGENT VALUATION) AND BENEFIT TRANSFER

NOTE: Problem Set #1 is due at beginning of class.


EOE, pp. 108-130, Chapter 6 (Kling, Catherine L., Daniel J. Phaneuf and Jinhua Zhao. "From Exxon to BP: Has Some Number Become Better than No Number?" Journal of Economic Perspectives. 26(4) 2012). OPTIONAL


FEBRUARY 24: BENEFITS OF MORBIDITY AND MORTALITY RISK REDUCTION


FEBRUARY 26: OPTIMAL EXTRACTION & USE OF NONRENEWABLE NATURAL RESOURCES


EOE, pp. 236-249, Chapter 15 (Solow, Robert M. "The Economics of Resources or the Resources of Economics." American Economic Review 64(2), 1974).

EOE, pp. 250-269, Chapter 16 (Covert, Thomas, Michael Greenstone and Christopher R. Knittel. "Will We Ever Stop Using Fossil Fuels?" Journal of Economic Perspectives 30(1), 2016). OPTIONAL

MARCH 2: MARKETS, MARKET FAILURE, AND PUBLIC POLICY FOR NONRENEWABLES

NOTE: Problem Set #2 is due at beginning of class.

TEXT, pp. 94-97, or NE pp. 111-113: The remainder of Chapter 6.


MARCH 4: RENEWABLE RESOURCES & COMMON-PROPERTY PROBLEMS

TEXT, pp. 91-97, 128-137: Chapter 5, “Market Failures…” from the heading “Public Good Provision…” to the end.

EOE, pp. 440-468, Chapter 27 (Stavins, “The Problem of the Commons: Still Unsettled After 100 Years.” American Economic Review 101(1), 2011). Material related to Part I of this paper is covered in this section of the course. Part II of this paper will be covered during the section on climate change.

MARCH 9: MIDTERM EXAMINATION

MARCH 23, 25, & 27: ECONOMICS OF POLLUTION CONTROL: AN OVERVIEW

TEXT, pp. 139-198: Chapters 8, “Principles of Market-Based…: and 9, “The Case for Market-Based…”


MARCH 30: LOCAL AIR POLLUTION

NOTE: Problem Set #3 is due at beginning of class.


APRIL 1: ACID RAIN

TEXT, pp. 200-207: Chapter 10, “Market-Based Instruments…” through “Compliance and Enforcement”


APRIL 6, 8, & 13: GLOBAL CLIMATE CHANGE – OVERVIEW AND NATIONAL POLICY

NOTE: Problem Set #4 is due at beginning of class on April 13.


APRIL 15, 20 & 22: GLOBAL CLIMATE CHANGE - INTERNATIONAL POLICY
Note: These lectures are interrupted on the 24th by Professor Frankel’s lecture on trade.


APRIL 27: TRADE, GROWTH, AND THE ENVIRONMENT (Professor Jeffrey Frankel)

NOTE: Problem Set #5 is due at beginning of class.


APRIL 29: GLOBAL CLIMATE CHANGE – COURSE CONCLUSION

Stavins, Robert N. and Robert C. Stow, eds. The Paris Agreement and Beyond: International Climate Change Policy Post-2020. Harvard Project on Climate Agreements, Belfer Center, October 2016. (Read only pages 1-17.)

