

# ENVS 1350: Environmental Economics and Policy

## Course Description, Fall 2010

### Basic Information

Instructor: Sriniketh Nagavarapu

Days/Time: TTh 10:30-11:50

Location: Bio Med Ctr 291

Suggested Pre-requisite: Econ 1110

Telephone: 3-6279

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Office Hours: W 2:00-3:30, 70 Waterman (Economics Dept. II) Office 202, or by appointment

### Summary of Course

This course covers the economic analysis of environmental issues, with an emphasis on the implications for designing appropriate policy measures. Specifically, we will cover the basic theory of economic markets and market failure in the presence of externalities; private and government solutions to market failure; the role of uncertainty in policy-making; the special concerns involving open trade environments and trans-boundary pollution, on a national and global scale; and the valuation of environmental goods. We will study the applications of these concepts to issues such as land use, air pollution, and water pollution. Finally, we will conclude with an in-depth application to climate change policy.

### Course Goals

By the end of the course, I hope that you will have a greater appreciation for the role of economics in environmental decision-making, as well as an ability to apply economic tools usefully in addressing environmental issues. Specifically, you should have the basic tools needed to:

- Design and evaluate alternative approaches to assessing the value of environmental goods or the costs of environmental deterioration
- Identify sources of market failure in real-world environmental situations
- Clearly delineate the consequences of market-based solutions and other regulatory solutions in these situations
- Understand how the relative merits of various private or government solutions are affected by the specific context at hand

### Books

We will use the textbook “Environmental Economics and Management: Theory, Policy, and Applications (5th ed.),” by Scott Callan and Janet Thomas. The reading list refers to the textbook as “CT”. The reading list also includes journal articles and working papers. I will post copies of the articles on the course website. Updates to the reading list will also appear on the course website.

If you are having trouble with the textbook or lectures, you may find the following two books useful:

- Environmental Economics, 2nd Edition, by Charles Kolstad
- The RFF Reader in Environmental and Resource Policy, 2nd Edition, Wallace Oates, Editor

The former is more technical than the Callan and Thomas book, and could help with lectures. The latter is less technical than the textbook, and could help you think about the fundamental ideas more. If you would like recommendations of other books to try, please let me know.

### Evaluation

While I want to focus on the material rather than grades, I realize there's always valid concern about how grades are determined. Your grade for this course will be determined as follows:

- **5 Problem Sets (35 %)**: The problem sets will be a mix of problems and short-answer questions. The short-answer questions will apply concepts from the traditional problems, lectures, and readings to real-world policy issues. You will have two weeks to work on each problem set. You are welcome to work with others, but you should write up your answers on your own. Please list the names of people you worked with on the first page of the problem sets. Due dates are as follows:
  - PS 1: Sep. 16
  - PS 2: Sep. 30
  - PS 3: Oct. 14
  - PS 4: Nov. 4
  - PS 5: Nov. 18
- **Research Proposal (10 %)**: This assignment will be due Dec. 2, and will require you to develop a narrow research question on an issue of importance in environmental policy or environmental economics. The proposal should include a literature review, a brief discussion of methodology, and a brief discussion of limitations. The entire proposal should be no more than a few pages, but I'll hand out details towards the middle of the semester.
- **Midterm Exam (20 %)**: The date of this closed-book exam will be October 19.
- **Take-home Final Exam (35 %)**: I'll hand out descriptions of the exam in late November. Students must work on the exam alone, though it will be open book. I'll hand out the exam on December 8, and it will be due on the evening of December 11 (which is the scheduled date for an in-class exam).

I'll use absolute cutoffs, as follows: A (87% or above); B (74% or above); C (61% or above); D (48% or above). If you are on a borderline and the quality of your work has shown improved understanding over the course of the semester – or you have been especially active in class discussions – then I'll likely bump you up to the higher grade.

**Note:**

No late assignments will be accepted. Also, there will be no make-up exams. If you have an emergency and cannot turn in homework on time, or cannot take the exam on the designated date, then please let me know. I will re-weight the value of your other assignments in this case.

**Syllabus****Unit I: Diagnosing the Problem****(Sep. 2): Overview of Environmental Economics**

- CT: ch. 1

**(Sep. 7): Review of Microeconomics**

- CT: ch. 2

**(Sep. 9): Market Failure – Public Goods and Externalities**

- CT: ch. 3, p. 52-68

**Unit II: Finding Solutions****(Sep. 14): Private Solutions: Property Rights and the Coase “Theorem”**

- CT: ch. 3, p. 69-76
- (Optional) Coase, Ronald H. “The Problem of Social Cost.” *Journal of Law and Economics* 3, (October 1960): 1-44.

**(Sep. 16): Government Solutions: Command and Control**

- CT: ch. 4

**(Sep. 21, 23): Government Solutions: Market-based Mechanisms**

- CT: ch. 5

**Unit III: Quantifying Consequences of Policy Options****(Sep. 28): Risk Analysis**

- CT: ch. 6

**(Sep. 30): Cost-Benefit Analysis – Introduction and Assessing Costs**

- Kelman, Steven. “Cost-Benefit Analysis: An Ethical Critique.” *AEI Journal on Government and Society Regulation* (March 1981): 33-40.

- Arrow, Kenneth, et al. “Is There a Role for Benefit-Cost Analysis in Environmental Health, and Safety Regulation?” Science, April 12, 1996.

- CT: ch. 8

**(Oct. 5): Cost-Benefit Analysis – Assessing Benefits – Environmental Demand Theory**

- CT: ch. 7

**(Oct. 7): Cost-Benefit Analysis – Assessing Benefits – Hedonic Price Theory, Travel Cost Methods, and Contingent Valuation**

- Chay, Kenneth and Michael Greenstone, “Does Air Quality Matter? Evidence from the Housing Market.” Journal of Political Economy 113, no. 2,(2005): 376-424. NOTE: Only pages 376-390 are required.
- Portney, Paul, “The Contingent Valuation Debate: Why Economists Should Care.” Journal of Economic Perspectives 8, no.4, (1994): 3-17.
- Hanemann, Michael, “Valuing the Environment through Contingent Valuation.” Journal of Economic Perspectives 8, no. 4 ,(1994):19-43.

**(Oct. 12): Cost-Benefit Analysis – Remaining Details**

- CT: ch. 9

**(Oct. 14): Midterm Review**

**(Oct. 19): Midterm**

**Unit IV: Applications and Refinements**

**(Oct. 21): Air Pollution Policy – Standards, the Weitzman Principle**

- CT: ch. 10

**(Oct. 26): Air Pollution Policy – Mobile Sources, Hidden Action and Hidden Information**

- CT: ch. 11

**(Oct. 28): Air Pollution Policy – Stationary Sources, Ambient-Differentiated Systems**

- CT: ch. 12

**(Nov. 2): Water Pollution Policy – Standards, Decentralization**

- CT: chs. 14

**(Nov. 4): Water Pollution Policy and Hazardous Waste Management – Source Types, Superfund, Auditing and Enforcement**

- CT: chs. 15, 17

## Unit V: Competitiveness, Growth, and Trade

### **(Nov. 9): (Finish Waste Management if necessary) Porter Hypothesis**

- Porter, Michael, and Claas van der Linde, “Tightening Environmental Standards: the Benefit-Cost or the No-Cost paradigm?” *Journal of Economic Perspectives* 9, no. 4(1995): 97-118.
- Palmer, Karen, Wallace Oates, and Paul Portney, “Tightening Environmental Standards: the Benefit- Cost or the No-Cost paradigm?” *Journal of Economic Perspectives* 9, no. 4(1995): 119-132.
- Jaffe, Adam, Steven Peterson, Paul Portney, and Robert Stavins, “Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?” *Journal of Economic Literature* 33 (1995):132-163.

### **(Nov. 11): Porter Hypothesis, Pollution Havens**

- Levinson, Arik and M. Scott Taylor. “Unmasking the Pollution Haven Effect” *International Economic Review* 49, no. 1(2008): 223-254.

### **(Nov. 16): Environmental Kuznets Curves, Consequences of Trade**

- Harbaugh, W., A. Levinson, and D. Wilson, “Re-examining Empirical Evidence for an Environmental Kuznets Curve.” *Review of Economics and Statistics* 84,(2002):541-51.
- Frankel, Jeffrey A. and Andrew K. Rose. “Is Trade Good or Bad for the Environment? Sorting Out the Causality” *The Review of Economics and Statistics* 87, no. 1(2005): 85-91.
- (Optional) Antweiler, Werner, Brian R. Copeland, and M. Scott Taylor. “Is Free Trade Good for the Environment?” *American Economic Review* 91, no. 4 (2001): 877-908.
- (Optional) Copeland, Brian R. and M. Scott Taylor. “Trade, Growth, and the Environment” *Journal of Economic Literature* 42 (2004): 7-71.

## Unit VI: Applications to Climate Change

### **(Nov. 18): Overview and Assessing Consequences**

- CT, ch. 13
- Tol, Richard S.J. “The Economic Effects of Climate Change”. *Journal of Economic Perspectives* 23, no. 2 (Spring 2009): 29-51.
- (Optional) Weitzman, Martin, “Some Basic Economics of Extreme Climate Change”. Mimeo, February 2009.

### **(Nov. 23): Policy Options**

- Aldy, Joseph E., Alan J. Krupnick, Richard Newell, et al. “Designing Climate Mitigation Policy”. NBER Working Paper Series 15022 (June 2009).
- Metcalf, Gilbert E. “Market-based Policy Options to Control U.S. Greenhouse Gas Emissions”. *Journal of Economic Perspectives* 23, no. 2 (Spring 2009): 5-27.
- Hepburn, Cameron, “Carbon Trading: A Review of the Kyoto Mechanisms”. *Annual Review of Environment and Resources* 32, (2007): 375-93.

**(Nov. 30): Addressing Specific Challenges – Renewable Energy, Energy Efficiency**

- Heal, Geoffrey, “The Economics of Renewable Energy”. NBER Working Paper Series 15081 (June 2009).
- Gillingham, Kenneth, Richard Newell, and Karen Palmer, “Energy Efficiency Economics and Policy”. NBER Working Paper Series 15031 (June 2009).

**(Dec. 2): Addressing Specific Challenges – Transportation, Deforestation**

- Bento, Antonio M., Lawrence H. Goulder, Mark R. Jacobsen, and Roger H. von Haefen. “Distributional and Efficiency Impacts of Increased US Gasoline Taxes” *American Economic Review* 99, no. 3 (2009): 667-699.
- (Optional) Davis, Lucas W. and Lutz Kilian. “Estimating the Effect of a Gasoline Tax on Carbon Emissions” NBER Working Paper Series 14685 (January 2009).

**(Dec. 7): Final Exam Review (Reading Period)**