

## **SYLLABUS: Economics of the Environment**

Time M W 10:05-11:20

Location 113 Social Sciences Building

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Office Hours TBA

### Course Summary

This class will focus on the role of the environment in the theory and practice of economics. It will make use of microeconomic and statistical analysis at the intermediate level and will incorporate real-world examples. The class will be divided into three parts. Part I will cover the ways in which markets fail to efficiently allocate resources in the presence of pollution along with the class of Pigouvian policies used to correct those failures. Part II will focus on the empirical techniques used by economists to put values on environmental commodities. Knowing these values is a precondition for properly applying the policies described in Part I. Part III examines five topics that apply many of the techniques learned in Parts I and II.

### Prerequisites

You should have completed the intermediate microeconomics sequence (Econ 55 and Econ 105) before taking this class. Ideally, you will also have completed the statistics and econometrics requirements for economics majors. You may be allowed into the class without having completed all these requirements with the permission of the instructor.

### Requirements

The following are required for successful completion of the course: (1) a theoretical problem set covering the concepts of market failure and Pigouvian policy, (2) a group empirical project in which you will implement a non-market valuation technique, (3) a short empirical project designed to illustrate the endogeneity of many environmental taxes (and to teach some basic empirical skills), (4) a short paper on hydraulic fracturing for shale gas extraction, and (5) class participation. We will have a number of in-class activities that are intended to keep things from getting boring. These sorts of activities generally work best if everyone comes prepared and participates. There will also be opportunity for participation in the course of normal lectures.

## Grading

Grades will be determined based on the following allocation:

Short Writing Assignments	10%
Class Participation (all in-class activities)	10%
Fracking Paper (2 parts)	20%
Theoretical Problem Set	20%
Group Empirical Project	20%
Final Exam	20%

## Readings

The **required** textbook for the class is

- Keohane and Olmstead, *Markets and the Environment* (Island Press, 2007)

It is available at the Duke Bookstore and can also be purchased on Amazon.com. Another **required** reading is:

- Starkist (A). Harvard Business School Case Study No. 9-794-128.

It will be made available through the Harvard Business School's web page (details provided in class).

Two other sources of **optional** readings are:

- Kolstad, *Environmental Economics* (Oxford University Press, 2000)
- Field and Field, *Environmental Economics: An Introduction* (McGraw Hill – Irwin)

These books are considerably more expensive and will be placed on reserve at Perkins Library. All optional readings in the following list are *italicized*.

## Introduction

### (1) Keohane and Olmstead, Ch. 1

- Rich and Broder. “A Debate Arises on Job Creation and Environment”
- Anderson. “How About a Green Tea Party? A Clean Environment Doesn’t Require Big Government”

### (2) Efficiency and Social Choice

- Handout on Efficient Exchange
- Keohane and Olmstead, Ch. 4
- *Kolstad, Ch. 3 and 4*
- *Field and Field, Ch. 4 (pp.63-69)*

## Part I – Market Failures and Pigouvian Policy

### (1) Externalities

- Keohane and Olmstead, Ch. 2 (pp.11-27), Ch. 5 (pp.65-76)
- *Kolstad 5 (pp.78-83, 90-94)*
- *Field and Field, Ch. 4 (pp.69-81)*

### ***Short Paper (Part #1): Costs and Benefits of Fracking***

### (2) Pigouvian Policy

- Keohane and Olmstead, Ch. 8 (pp.129-140, 150-151), Ch. 9 (pp.153-161)
- *Kolstad, Ch. 7 (pp.117-124, 129-131), Ch. 8*
- *Field and Field: Chs. 10 (pp.193-200, 204-208), 11 & 12*

### ***Short Empirical Project: Endogenous Taxation***

### (3) Decentralized Approaches (Information, Voluntary Compliance, and Liability)

- Hamilton (1995), “Pollution as News: Media and Stock Market Reactions to TRI Data.” *Journal of Environmental Economics and Management*. 28:98-113.
- Arora and Cason (1995). “An Experiment in Voluntary Environmental Regulation: Participation in EPA’s 33/50 Program.” *Journal of Environmental Economics and Management*. 28:271-286.
- Richardson. “US Oil Spill Law.” *RFF Policy Background*.
- Harrington (1988). “Enforcement Leverage When Penalties are Restricted.” *Journal of Public Economics*. 37:29-53.
- Becker (1968). “Crime and Punishment: An Economic Approach.” *Journal of Political Economy*. 76(2):169-217.

### ***Starkist (A). Harvard Business School Case Study No. 9-794-128.***

(4) Coase Theorem

- Keohane and Olmstead, Ch. 8 (pp.125-129)
- Coase (1960). “The Problem of the Social Cost.” *Journal of Law and Economics*.
- Hamilton (1995). “Testing for Environmental Racism: Prejudice, Profits, and Political Power?” *Journal of Policy Analysis and Management*. 14(1):107-132.
- *Kolstad, Ch.6*
- *Field and Field: Ch. 10 (pp.200-204)*

***Short Paper (Part #2): Fracking Policy Options***

(5) International Agreements

- *Kolstad, Ch.13 (pp.263-266)*
- *Field and Field, Ch. 21 (pp.456-468)*

(6) Uncertainty

- Keohane and Olmstead, pp.143-150
- NERC Podcast
- *Kolstad, Ch. 10 (pp.183-189)*

(7) Discounting

- Keohane and Olmstead, Ch. 2 (pp.27-30)
- *Field and Field, Ch. 6 (pp.121-126)*

(8) Heterogeneity and Tradable Permits

- Keohane and Olmstead, Ch.9 (pp.162-168, 173-181), Ch.10 (pp.182-190)
- *Kolstad, Ch.9*
- *Field and Field, Ch.13*

***In-Class Emissions Trading Exercise***

(9) Free-Lunches: The Double Dividend and Porter Hypotheses

- Keohane and Olmstead, Ch.8 (pp.150-151)
- Porter and van der Linde (1995). “Toward a New Conception of the Environment-Competitiveness Relationship.” *Journal of Economic Perspectives*. 9(4):97-118.
- Rassier and Earnhart (2010). “The Effect of Clean Water Regulation on Profitability: Testing the Porter Hypothesis.” *Land Economics*. 86(2): 329-344.
- Goulder and Parry. “Green Tax Reform and the Double Dividend.” *RFF Newsletter*.
- *Kolstad, Ch.14 (pp.281-284)*

(10) Other Market Failures: Tragedy of the Commons and Risk Externalities

- Keohane and Olmstead, Ch.5 (pp.76-82)
- Hardin (1968). “The Tragedy of the Commons.” *Science*. 126: 1243-1248.

***Theoretical Problem Set Due***

**Part II – Non-Market Valuation**

***Empirical Group Projects Distributed***

(1) Cost-Benefit Analysis and Sources of Value

- Keohane and Olmstead, Ch.3
- Hahn and Dudley (2007). “How Well Does the US Government Do Benefit-Cost Analysis?” *Review of Environmental Economics and Policy*. 1(2):192-211.
- *Kolstad, Ch.15*
- *Field and Field, Ch.6 (pp.115-128, 155-157)*

(2) Hedonics

- *Kolstad, Ch.16 (pp.323-331)*

(3) Travel Cost

- Hanley, Shogren, and White, Ch.3 (pp.53-59)
- *Kolstad, Ch.17 (pp.344-350)*

(4) Contingent Valuation

- *Kolstad 18 (pp.355-364)*
- “Report of the NOAA Panel on Contingent Valuation.” *Federal Register*. 58(10):4601-4614.

## Part III – Topics

### (1) Environmental Justice

- Sadd, Pastor, Boer, and Snyder (1999). “Every Breath You Take...’: The Demographics of Toxic Air Releases in Southern California.” *Economic Development Quarterly*. 13:107-123.
- GAO (1983). “Siting of Hazardous Waste Landfills and Their Correlation with Racial and Economic Status of Surrounding Communities.” GAO / RCED-83-168.

### ***In-Class Tiebout Sorting Exercise***

### (2) Exhaustible Resources – Oil

- Keohane and Olmstead, Ch.6

### (3) Sustainable Development, Green Accounting, and the Environmental Kuznets Curve

- Keohane and Olmstead, Ch.7 (pp.109-110), Ch.11
- Solow (1992). “An Almost Practical Step Toward Sustainability.”
- Harris, Ch.8 (pp.136-146)
- Cole, Rayner, and Bates (1997). “The Environmental Kuznets Curve: An Empirical Analysis.” *Environment and Development Economics*.
- Kolstad, Ch.13 (pp.245-249)

### ***In-Class Debate: Are biofuels the answer? What are the alternatives?***

### (4) Managing Threatened Species: Elephants and Ivory

- Keohane and Olmstead, Ch.7 (pp.110-124)
- McPherson and Nieswiadomy (2000). “African Elephants: The Effect of Property Rights and Political Stability.” *Contemporary Economic Policy*. 18(1):14-26.
- Kremer and Morcom (2000). “Elephants.” *American Economic Review*. 90(1):212-234.
- De Alessi (2004). “An Ivory Tower Take on the Ivory Trade.” *Econ Journal Watch*. 1(1):47-54.

### (5) The Agricultural Impacts of Climate Change

- Mendelsohn, Nordhaus, and Shaw (1994). “The Impact of Global Warming on Agriculture: A Ricardian Analysis.” *American Economic Review*. 84(4):753-771.
- Adams et al. (1990). “Global Climate Change and US Agriculture.” *Nature*. 345:219-224.