

**ENVIRONMENTAL ECONOMICS**  
ECON 207  
Lecture (2 times weekly)

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**Office Hours:** 2 hours scheduled weekly  
Also by appointment

**Course Description**

This is a graduate level course focusing on the theory and methods of environmental economics. The first part of the course develops core concepts in a deterministic and static framework, while the latter part of the course introduces stochastic and dynamic elements. Topics examined include: welfare theory, externalities, property rights, and resource allocation mechanisms.

**Prerequisites**

The course requires a command of calculus and graduate level microeconomic theory, including game theory. Economics 200A is a prerequisite; Economics 200B and 200C are recommended.

**Course Website**

The course is registered as a Blackboard course at <http://www.ilearn.ucr.edu>. Course materials will be posted on this website in PDF format. You must have an active UCR email account to access the website and a PDF reader installed on your computer to view the files. Instructions for obtaining a free PDF reader are posted on the website.

**Readings**

The course will use five books:

- Baumol, W.J. and W.E. Oates, 1988. The Theory of Environmental Policy, 2<sup>nd</sup> Ed. Cambridge.
- Hanley, N., J.F. Shogren and B. White, 1997. Environmental Economics in Theory and Practice. Oxford.
- Perman, R. Y. Ma, J. McGilvray and M. Common, 2003. Natural Resource and Environmental Economics, 3<sup>rd</sup> Ed. Addison Wesley.
- Dorfman, R. and N.S. Dorfman, 1993. Economics of the Environment: Selected Readings, 3<sup>rd</sup> Ed. Norton.
- Oates, W.E., 1992. The Economics of the Environment. Edward Elgar.

The first three are textbooks that have been placed on 2 hour reserve in Rivera Library. The latter two are edited volumes of classic journal articles in environmental economics (UCR only has an earlier edition of the Dorfman volume, also on reserve in Rivera). Each book should be available for purchase through the UCR bookstore. Additional articles will be assigned and/or suggested to supplement these books.

**Grading**

- Two problem sets: 20% each
- Midterm exam: 25%
- Final exam: 35%

You may work on the problem sets in groups, but you must hand-in your own independent write-up. Write-ups must be typed or neatly written – illegible answers and poor writing will be marked down. Late assignments will be penalized 20% each day after the due date.

The midterm and final exams will cover material from lectures, assigned readings and problem sets. The formats and timing of these exams are yet to be determined but may involve both in-class and take-home portions. The final exam will be cumulative but will emphasize the latter part of the course. Final letter grades will be curved.

## Tentative Course Outline and Reading List

### **Introduction**

- Topics:
  - Scope and nature of environmental economics
  - The economy and the environment
  - Biophysical concepts for environmental management
- Readings:
  - Hanley et al.: chapter 1
  - Ayers & Kneese: *Production, Consumption and Externalities*, AER 1969 (Oates)
  - Cropper & Oates: *Environmental Economics: A Survey* (§ I, II[A], VI), JEL 1992

### **Welfare Theory**

- Topics:
  - Values and social choice
  - Analytical framework
  - Efficiency
- Readings:
  - Perman et al.: chapter 3
  - Hardin: *The Tragedy of the Commons*, Science 1968 (Dorfman)
  - Krutilla: *Conservation Reconsidered*, AER 1967 (Oates, Dorfman)

### **Market Failure**

- Topics:
  - Incomplete markets [Hanley 2.1, 2.2; Coase]
  - Non-rivalry and non-excludability [Hanley 2.4, 2.5; Randall]
  - Externalities [Hanley 2.3; B&O 2 – 4]
  - Nonconvexities [Hanley 2.6, 2.8; B&O 8.1 – 8.4, 8.7 – 8.9]
- Readings:
  - Hanley et al.: chapter 2
  - Baumol & Oates: chapters 2 – 4 and 8
  - Coase: *The Problem of Social Cost*, JLE 1960 (Oates, Dorfman)
  - Randall: *The Problem of Market Failure*, NRJ 1973 (Dorfman)

### **Environmental Regulation**

- Topics:
  - Standards and liability rules [Hanley 3.1, 3.3]
  - Taxes and subsidies [Hanley 3.2, 4; B&O 11 (skim), 14.1, 14.2, 14.3]
  - Marketable permits [Hanley 3.4 – 3.7, 5; B&O 12]
- Readings:
  - Hanley et al.: chapters 3 – 5
  - Baumol & Oates: chapters 11, 12 and 14
  - Cropper & Oates: *Environmental Economics: A Survey* (§ II[B-E], III[A-F,H], IV[E]), JEL 1992
  - Dales: *Land Water and Ownership*, CJE 1968 (Dorfman)
  - Montgomery: *Markets in Licenses and Efficient Pollution Control Programs*, JET 1972 (Oates)
- Optional Reading:
  - Kling & Rubin: *Bankable Permits for the Control of Environmental Pollution*, JPE 1997
  - Montero: *Voluntary Compliance with Market-Based Environmental Policy: Evidence from the U.S. Acid Rain Program*, JPE 1999
  - Portney: *EPA and the Evolution of Federal Regulation*, 1990 (Dorfman)

### **Uncertainty and Dynamics**

- Topics:
  - Regulating point source flow pollutants [B&O 5; Opaluch; Yates & Cronshaw]
  - Regulating point source stock pollutants [Perman 16; Griffin; Falk & Mendelsohn]

- Regulating non-point source pollutants [Segerson; Cabe & Herriges]
  - Regulation with endogenous technical change [Mendelsohn; Fischer, Parry & Pizer]
- Readings:
  - Baumol & Oates: chapter 5
  - Perman et al.: chapter 16
  - Cabe & Herriges: *The Regulation of NPS Pollution under Imperfect and Asymmetric Information*, JEEM 1992
  - Falk & Mendelsohn: *The Economics of Controlling Stock Pollutants: An Efficient Strategy for Greenhouse Gases*, JEEM 1993
  - Fischer, Parry & Pizer: *Instrument Choice for Environmental Protection When Technological Innovation Is Endogenous*, JEEM 2003
  - Griffin: *Environmental Policy for Spatial and Persistent Pollutants*, JEEM 1987
  - Mendelsohn: *Endogenous Technical Change and Environmental Regulation*, JEEM 1984
  - Opaluch: *Dynamic Aspects of Effluent Taxation under Uncertainty*, JEEM 1984
  - Segerson: *Uncertainty and Incentives for Non-Point Pollution Control*, JEEM 1988
  - Yates & Cronshaw: *Pollution Permit Markets with Intertemporal Trading and Asymmetric Information*, JEEM 2001
- Optional Reading:
  - Perman et al.: appendix 14.1
  - Adar & Griffin: *Uncertainty and the Choice of Pollution Control Instruments*, JEEM 1976 (Oates)
  - Bruneau: *A Note on Permits, Standards and Technological Innovation*, JEEM 2004
  - Hoel & Karp: *Taxes versus Quotas for a Stock Pollutant*, REE 2002
  - Kwerel: *To Tell the Truth: Imperfect Information and Optimal Pollution Control*, REStud 1977
  - Magat: *Pollution Control and Technical Advance: A Dynamic Model of the Firm*, JEEM 1978
  - Newell & Pizer: *Regulating Stock Externalities under Uncertainty*, JEEM 2003
  - Roberts & Spence: *Effluent Charges and Licenses under Uncertainty*, JPE 1976 (Oates)
  - Shortle: *The Allocative Efficiency Implications of Water-Pollution Abatement Cost Comparisons*, WRR 1990
  - Shortle & Dunn, *The Relative Efficiency of Agricultural Source Water Pollution Control Policies*, AJAE 1986
  - Smith: *Dynamics of Waste Accumulation: Disposal versus Recycling*, QJE 1972
  - Weitzman: *Prices vs. Quantities*, REStud 1974 (Oates)
  - Weitzman: *Why the Far-Distant Future Should be Discounted at Its Lowest Possible Rate*, JEEM 1998

### **Macro Environmental Economics (time permitting)**

- Topics:
  - International trade and environmental quality
  - Transboundary pollution
  - Global environmental management
- Readings:
  - Hanley et al.: chapter 6
  - Barrett: *International Cooperation for Environmental Protection*, OREP 1990 (Dorfman)
  - Chichilnisky: *North-south Trade and the Global Environment*, AER 1994
  - Cropper & Oates: *Environmental Economics: A Survey* (§ III[G]), JEL 1992
  - Folmer & Mouche: *Interconnected Games and International Environmental Problems*, ERE 1993
  - Krutilla: *Environmental Regulation in an Open Economy*, JEEM 1991
  - Thompson & Strohm: *Trade and Environmental Quality: A Review of the Evidence*, JED 1996
  - Whalley: *The Interface between Environment and Trade Policies*, EJ 1991