

Johns Hopkins University

Department of Applied Economics

Course Number 440.640.51

**ENVIRONMENTAL AND
RESOURCE ECONOMICS**

Summer, 2007

Our economic and social systems are increasingly facing challenging questions regarding the protection of the environment, the management of natural resources and the achievement of economic progress that is in some sense “sustainable” given technological and natural constraints. Decision-makers express growing concern for these issues, though their approaches to them are not always consistent or well-directed.

This course is founded on the conviction that economic reasoning has much to offer (though it is not a panacea) in addressing these challenges. This course is designed to provide the basic conceptual grounding for the use of economics to inform decisions regarding the proper use of the environment and natural resources.

Beginning with the concept of “sustainability”, the course develops a framework for an economic assessment of environmental problems including the notion of market failures, valuation of environmental resources and policy design issues associated with using alternative economic incentives and instruments. The second part of the course examines principles of the economically efficient management of renewable (e.g., fisheries, forests) and depletable (e.g., fossil fuels, natural ecosystems) resources. A number of applied settings are used to demonstrate the principles taught in the course.

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Course Prerequisites. The prerequisite for this course is a graduate level course in microeconomic theory. The course material is presented using economic reasoning and graphical and mathematical analysis. Calculus will be use in some specific examples in the lecture materials. Some case studies involving econometric analysis will be examined in the context of the course.

Course Requirements. There will a mid-term and a final exam. The mid-term will be worth roughly 40% of the final grade. The final exam will be worth roughly 40% of the final grade. There will be homework in the form of problem sets throughout the course. The problem sets will be worth 20% of the final grade. The summer course goes fairly quickly so please try to stay current with course materials.

Readings. The basic course texts are the **Economics of Natural Resources and the Environment** (Johns Hopkins Press, 1990) by D. Pearce and R.K. Turner and **Environmental Economics: In Theory and Practice** (Oxford University Press, 1997) by N. Hanley, J. Shogren and B. White. Readings from various journals and working papers will be assigned and passed out in class. Supplemental readings listed below may be required if time permits.

SYLLABUS AND READINGS

1. Sustainable Development: An Economic Perspective

Morita, T., “*Sustainable Development – its definitions and goals*”, *Mita Journal of Economics*, 1993

Pearce, D. and Turner, K., Chapter Two, The Circular Economy

Pearce, D. and Turner, K., Chapter Three, The Sustainable Economy

Hanley et al., Chapter Fourteen, The Economics of Sustainable Development, pp. 425-433

Green Income Accounting

“*Are We Saving Enough for the Future?*” Chapter Two of Expanding the Measure of Wealth, Indicators of Environmentally Sustainable Development, The World Bank, 1997

2. Environmental Kuznets Curves

Panayotou, T., “*Environment and Development*”, Harvard/Kennedy School Case Study Paper Series, 2001

Case Study: Lead from Gasoline

Levinson, A., Hilton, F., “*Factoring the Environmental Kuznets Curve: Evidence from Automotive Lead Emissions*,” *Journal of Environmental Economics and Management*, 1998

THE ECONOMICS OF THE MANAGEMENT OF THE ENVIRONMENT

3. Economic Efficiency, Property Rights and Market Failures

Hanley et al., Chapter Two, Market Failures, *Environmental Economics in Theory and Practice*, pp. 22 – 25

Pearce, D. and Turner, K., Chapter Four, The Optimal Level of Pollution

Public Goods: My Notes

Pearce, D. and Turner, K., Chapter Five, The Market Achievement of Optimal Pollution

4. Designing Pollution Reduction Strategies

“A Pollution Taxonomy”: My Notes

Pollution Charges and Standards

Pearce, D. and Turner, K., Chapter Six, Taxation and Optimal Pollution

Hanley et. al., “Emissions Charges”, Chapter Three, Economic Incentives for Environmental Protection, *Environmental Economics in Theory and Practice*, pp. 61 – 64

Supplemental Reading

Hanley, et. al., “Non-Convexities”, Chapter Two, Market Failure, *Environmental Economics in Theory and Practice*, pp. 46 - 49

Pollution Reduction Subsidies

Hanley, N. et. al., “Subsidies” from Chapter Three, Economic Incentives for Environmental Protection, *Environmental Economics in Theory and Practice*, pp. 72 - 75

Supplemental Reading

Pearce, D. and Turner, K., “Pollution Reduction Subsidies”, Chapter Seven, Environmental Standards, Taxes and Subsidies, pp. 107 - 109

Marketable Tradable Permits

Pearce, D. and Turner, K., Chapter Eight, Marketable Pollution Permits

Hanley, N. et. al., “The Basic Theory of Tradable Pollution Permits”, Chapter Five, *Environmental Economics in Theory and Practice*, pp. 130 - 136

Case Study: Acid Rain

Schmalensee, R. et. al., “An Interim Evaluation of Sulfur Dioxide Emissions Trading”

Joskow, P. and Schmalensee, R., *“The Political Economy of Market-Based Environmental Policy: The U.S. Acid Rain Program”*

Case Study: Climate Change

Edmonds, J. et. al., “Modeling Future Greenhouse Gas Emissions: The Second Generation Model Description”, United Nations University Press, 1990

Edmonds, J. et. al., *“Unfinished Business: The Economics of the Kyoto Protocol”*, Pacific Northwest National Laboratory Working Paper, 1998

“The Role of Production Functions in Determining the Costs of Climate Policy”: My Notes

Supplemental Reading

Harrington, W. et. al., *“On the Accuracy of Regulatory Cost Estimates,” Journal of Policy Analysis and Management, 2000*

5. Benefit-Cost Analysis

Benefits Estimation

Pearce, D. and Turner, K., Chapter Fourteen, Discounting the Future

Pearce, D. and Turner, K., Chapter Nine, Measuring Environmental Damage I: Total Economic Value

Hanley, N. et. al., “The Theory of Non-Market Valuation”, Chapter Twelve, *Environmental Economics in Theory and Practice*, pp. 356 - 364

Pearce, D. and Turner, K., Chapter Ten, Measuring Environmental Damage II: Valuation Methodologies

Supplemental Reading

Hanley, N. et. al., “Methods of Valuing Environmental Costs and Benefits”, Chapter Thirteen, *Environmental Economics in Theory and Practice*

Case Study: Travel Cost Method

Kolstad, C., “Travel Cost Method” from *Environmental Economics*, 2002, pp. 348 - 349

Case Study: Contingent Valuation Method

Deck, L., “*Visibility at the Grand Canyon and the Navajo Generating Station*”, from *Economic Analysis at EPA: Assessing Regulatory Impact*, 1997

Value of a Life Saved

Hammit, J., “*Valuing Mortality Risk: Theory and Practice*”, *Environmental Science and Technology*, 2000

Van Hootven, G. and Cropper, M. “*When Is a Life Too Costly to Save?: Evidence from Environmental Regulations*”, *Resources*, 1994

Supplemental Reading

Kelman, S., “*Cost-Benefit Analysis: An Ethical Critique (with replies)*”, *Economics of the Environment*, 2000

Portney, P., “*The Contingent Valuation Debate: Why Economists Should Care*,” *Economics of the Environment*, 2000

THE ECONOMICS OF RESOURCE MANAGEMENT

6. Renewable Resources

Tietenberg, T., Chapter Thirteen, *Renewable Common-Property Resources: Fisheries and Other Species*

Supplemental Reading

Pearce, D. and Turner, K., Chapter Sixteen, *Renewable Resources*

Game Theory

Hanley, N. et. al., “*Technical Note: Game Theory*”, *The Economy and the Environment*, Chapter One, pp. 14 – 17 and Chapter Two, “*Market Failure*”, pp. 39 – 42, *Environmental Economics in Theory and Practice*

7. Nonrenewable and Depletable Resources

Tietenberg, T., Chapter Seven, *The Allocation of Depletable (i.e., Energy) and Renewable Resources: An Overview*

Tietenberg, T., Chapter Five, *Sustainable Development*, pp. 89 - 93

Pearce, D. and Turner, K., Chapter Eighteen, Exhaustible (i.e., Energy) Resources

Case Study: Renewable Resources

Butraw, D., et. al., “*Renewable Energy: Winner, Loser or Innocent Victim*”, Resources 9, Spring 2000.

Supplemental Reading

Fisher, A., Chapter Two, “Exhaustible Resources”, *Resource and Environmental Economics*, pp.12 - 23