Johns Hopkins University
Department of Applied Economics

Course Number AS.440.650.51

Environmental and Resource Economics
Fall, 2016

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 concerns for these issues, though their approaches to addressing these concerns 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, policy design issues associated with using alternative economic incentives and instruments such as pollution taxes, environmental subsidies and marketable tradable pollution permits, cost-benefit analysis as applied to environmental issues, and the valuation of environmental resources. The last portion of the course examines principles of the economically efficient management of depletable resources (e.g., fossil fuels) and renewable resources (e.g., fisheries, forests). A number of applied settings are used to demonstrate the principles taught in the course.

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Course Goals & Learning Objectives

The main goal of this course is to introduce students to major theories and policy issues in the field of environmental and resource economics. The course will cover a diverse range of topics: the economics of sustainability, market failures, economic incentives, climate change, environmental and resource valuation techniques, exhaustible resources (e.g., oil and natural gas) and renewable resources (e.g., fisheries). Emphasis is placed on the use of analytical and econometric techniques to assess real world environmental and resource problems.

Upon completion of this course, students will be able to:
• Apply the concepts and tools of economics to conduct independent research on environmental and resource economics topics;
• Analyze the efficacy and efficiency of various policy options;
• Help advise policymakers on environmental and resource-related issues; and
• Demonstrate how economic principles can be applied to improve environmental quality as well as the use of natural resources.

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 used in the lecture materials. Some case studies involving econometric analysis and the use of spreadsheet tools will be examined in the context of the course.

Readings. The basic course text is *Environmental Economics: In Theory and Practice*, 2nd Edition, 2007, by Hanley, N., Shogren, J. and White, B. Readings from various journals and working papers will be assigned throughout the course. Supplemental readings listed below may be required, time permitting.

Grading. There will be a Mid-term exam and a Final exam. The Mid-term exam will be in class around the mid-point (e.g., the seventh week) of the semester. The Final exam will be in the last week of the semester. Both exams will be given in class. The Mid-term and Final exams are worth 40% of your overall course grade. There will be five homework assignments throughout the semester. Three of the homework assignments are assigned before the Mid-Term Exam. Two of the homework assignments are assigned after the Mid-term exam. The homework assignments are worth 15% of your overall course grade. Class participation is worth 5% of your overall course grade.

**SYLLABUS AND READINGS**

**Unit One: Sustainable Development**

Hanley et al., Chapter Two, The Economics of Sustainable Development, pp. 14 – 37

**Unit Two: Environmental Kuznets Curve**

Yandle, B., Vijayaraghavan, M., Bhattarai, M., “The Environmental Kuznets Curve: A Primer”, PERC Research Study, 02–1, May 2002


**Unit Three: Property Rights, Coasean Bargaining and Externalities**


Hanley et al., Chapter Three, Market Failure: Introduction (3.1) and Markets: Efficient or Otherwise (3.2), pp. 42 – 48; Market Failure: Externalities (3.3), pp. 49 – 57

**Unit Four: Non-Exclusivity and Public Goods**


Hanley et al., Chapter Three, Market Failure, Non-Rivalry and Public Goods (3.5), pp. 61 – 65 and Concluding Remarks, (3.8), pp. 75 – 79

Hanley, et al., Chapter Three, Market Failure, Non-Exclusion and the Commons (3.4), pp. 57 – 61

**Unit Five: Incentive Design**

Hanley et al., Chapter Four, Incentive Design, Introduction (4.1), pp. 82 – 85 and Emissions Charges (4.2.1), pp. 85 – 88


Hanley et al., Chapter Four, Incentive Design, Subsidies (4.2.4), pp. 97 – 100

**Unit Six: Emission Trading**

Pearce, D. and Turner, K., Chapter Eight, Marketable Pollution Permits (8.1-8.4), pp. 110 – 119

Hanley et al., Chapter Five, Incentive Design, Efficiency Properties of Tradable Pollution Permits (5.3), pp. 144 – 147

Unit Seven: Climate Change

Hanley et al., Chapter Six, Transboundary Pollution and Global Public Goods, (6.2), Background Issues and a Basic Game, Uniformity of Damages; Uniformity of Mixing, pp. 175 – 179, International Externalities as Games of Strategy (Section 6.2.2) and A Basic Game (Section 6.2.3), pp. 179 – 190, Global Public Good Game (6.3.2), pp. 191 – 193


Unit Eight: Environmental Benefits Estimation


Unit Nine: Value of a Life Saved


Unit Ten: Discounting


**Unit Eleven: Exhaustible Resources**


Tietenberg, T. and Lewis, L., Chapter Five, Dynamic Efficiency and Sustainable Development, A Two-Period Model, pp. 103 – 107


Pearce and Turner, Chapter Eighteen, Exhaustible Resources, The Effects of Changing Parameters, 18.5, Monopoly and the Rate of Extraction, 18.6, Economics of Natural Resources and the Environment 1990, pp. 278 – 285


**Unit Twelve: Renewable Resources**