

# Environmental Economics

**Course Description:** Most economics classes emphasize the allocation and production efficiency of the free market: that is, producing the correct number of goods and distributing those goods to people who get the greatest utility from them. In this view, the outcomes produced by market decisions are Pareto Optimal and welfare maximizing. However, this view ignores market failures that can cause inefficiencies.

Many of these inefficiencies are related to environmental goods. Externalities such as sulfur dioxides, fine particulates or carbon dioxide and public goods such as clean air are not accounted for in traditional markets, which tend to ignore such goods in analyzing decisions regarding the economy. This course will use tools developed in earlier economics classes, including welfare analysis, tax distortions, second-best solutions, aggregating demand curves, and apply them to examine market failures and solutions to those failures.

This course explores the economic foundations for public decision-making about environmental issues. Emphasis is placed on the conventional welfare economics approach centering on market failure due to externalities and public goods, cost-benefit analysis, cost-effective policy design, and non-market valuation. Property rights, the political economy of regulation, and ecological economics are also introduced.

This course is designed for undergraduates in Applied Economics, Economics, Natural Resources and other disciplines who are interested in extending concepts from intermediate microeconomic principles to the design of environmental policy. Lectures and readings presume an intermediate understanding of microeconomic theory and introductory calculus. (Students should understand supply and demand curves, welfare analysis, the distortion effects of taxation, and unconstrained and constrained optimization.) Assigned readings include chapters from an environmental economics text as well as several contemporary and classic articles in environmental economics.

- Topics:**
- 1) Social choice and environmental economics
  - 2) Foundations: Market success and Pareto efficiency
  - 3) Market failures: Public goods, commons goods, externalities
  - 4) Economic instruments for cost-effective pollution control
  - 5) Benefit-cost concepts and non-market valuation

- Objectives:** Upon completion of this course, students should be able to:
- Describe common market failures: externalities and public goods
  - Explain why traditional economics fail to address these market failures
  - Describe how Pigovian taxes, cap and trade and other instruments address these problems
  - Compare and contrast the advantages and disadvantages of these instruments for dealing with market failures
  - Understand the problems of estimating the value of non-market goods
  - Describe how various estimators for non-market goods are employed

**Text:** *Environmental Economics*, Second Edition, 2010. Charles Kolstad.  
Oxford University Press

**Instructor:**

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**Course Web Site:** The course web site is accessible through [blackboard.cornell.edu](http://blackboard.cornell.edu).

**AEM Learning Goals:** “*AEM has adopted learning goals that we hope each student achieves while getting a degree from our program. Each individual course will not cover all learning goals; however, through your program of study you should be able to improve your knowledge and skills across all learning goals.*” AEM statement regarding learning goals

<b>AEM Learning Goals</b>	<b>Some ways in which this course contributes to meeting the goals</b>
Develop effective communication skills	➤ In assignments and in cooperative work with other students
Attain analytical and functional competency in basic business and economic skills	➤ Concepts and models of environmental economics ➤ Application of calculus for optimization
Demonstrate working knowledge of ethics and ability to apply to real world settings	➤ Discussion of different ethical systems, and the ethical underpinnings of conventional economics
Demonstrate ability to solve practical business and economic problems and make an impact in real world and society	➤ Application of course concepts and models to policy and to individual and business decisions
Develop skills to be critical consumers of business and economic information and research	➤ Become proficient with conventional economic arguments regarding environmental policy ➤ Better understand motives of business interests and politicians (important information providers) in current and future environmental policy debates

**Grading:** Grades will be calculated out of 100 points, distributed as follows:

Assignments: 20% (lowest score dropped)  
Experiments: 20%  
Preliminary Exam: 20%  
Project: 20%  
Final Exam: 20%

**Assignments:** This course will include several assignments meant to develop the ability to solve quantitative problems typical of those found in environmental economics. Assignments must be handed in by the beginning of class on the due date to receive full credit. Assignments will be accepted until the beginning of the next class with a 10% penalty, after which solutions will be made available. While each student must hand in their own answers, problem sets are to be viewed as learning exercises rather than as take-home exams. As such, collaboration is encouraged, but the final write-up must be one's own. Each student's lowest problem set grade will be dropped, and the assignment grade will be based on the mean of the student's score on the remaining problem sets.

**Experiments:** Several experiments are planned which will let students make decisions that highlight common problems in environmental economics. Such experiments include the voluntary contribution mechanism, which highlights issues with public goods, and an emissions trading market, which simulates the decisions that power plant managers must face to comply with the Acid Rain Trading Program or proposed carbon cap and trade programs.

**Preliminary Exam:** This in-class exam is scheduled for [DATE]. It will ask about material covered through [DATE], will be based on material covered in the assignments, the lectures, and the readings.

**Project:** In a group, students must analyze a contemporary issue that relates to environmental economics. The deliverables are a ten minute presentation in class during the last(?) week of the semester and a ten-page paper. Grading will be split between the paper and the presentation.

**Final Exam:** A comprehensive final exam that emphasizes topics covered since the preliminary exam.

To facilitate fairness, all appeals relating to scores assigned during grading must be submitted in writing to the instructor. Relevant materials should accompany a written statement describing the reason for appeal.

**Students with Disabilities:** If you have a documented disability and wish to discuss academic accommodations, please get in touch with the instructor as soon as possible.

**Code of Conduct:** [Insert information here]

**Preliminary Schedule:**

Week 1: Topics: Recap of Microeconomics, Introduction to Environmental Economics, The Ethics of the Environment  
Reading: Pages 1-44

- Week 2: Topics: Recap of Microeconomics, Public Goods, Externalities, Pigovian Fees  
Reading: 90-114, The Problem of Social Cost  
Activities: VCM Game, Homework #1
- Week 3: Topics: The Coase Solution, Equimarginal Principle, Fees vs Subsidies, Second-Best Solution  
Reading: 117-132  
Activities: Marketable Permits Experiment
- Week 4: Topics: Cap and trade, Command and Control, Political Economy of Regulation  
Reading: 135-151, “The Grand Policy Experiment”, “Standards vs Standards”  
Activity: Homework #2
- Week 5: Topics: Game Theory and Policy, Weitzman Proposition, Segerson Mechanism  
Reading: Kolstad chapter 10, 11  
Activity: Segerson Game
- Week 6: Topics: Prelim Review  
Preliminary Exam

### **Spring Break**

- Week 7: Topics: Cost-Benefit Analysis, Risk, Prospect Theory, Non-Market Valuation, VSL, WTP vs WTA  
Reading: Kolstad, Chapters 12, 15-18, Summers Memo  
Activity: Nudge Experiment
- Week 8: Topics: Problems with Non-Market Valuation, Examples of CBA  
Reading: McKinsey GHG Report  
Activity: Homework #3
- Week 9: Topics: Environmental Kuznets Curve, Double Dividend  
Reading: Kolstad, Chapters 13-14
- Week 10: Presentations
- Week 11: Presentations