Economics 436
Environmental Economics
Summer 2017
Prof. Robert Halvorsen

This course analyzes the relationship between economic activity and environmental quality. The major topics considered are the economic origins of environmental problems, the trade-offs involved in determining the goals of public policy toward the environment, the choice of policy instruments for attempting to attain those goals, and the role economic analysis has played in the formulation of actual environmental policy in the U.S.

By the end of the course, students should understand how to apply economic analysis to determine the optimal level of environmental quality, the circumstances under which a free market system will and will not result in optimal outcomes, and the advantages and disadvantages of alternative policy instruments for improving on market outcomes.

The class discussions and problem sets will assume that students have a solid understanding of intermediate level microeconomics as taught in ECON 300. There will be two exams and eight required problem sets. The exams will count for 90% of the grade, with the exam on which you do better counting for 50% of the course grade and the exam on which you do worse counting for 40%. The problem sets will count for the other 10% of the course grade. They will be graded credit/no credit, with full credit being given for a problem set as long as a sincere effort is made to complete it.

My office hours during the Summer Quarter are 2:30-3:30 daily in Savery 351. You can make an appointment to meet at another mutually convenient time in person after class, by phone at 206-543-5546, or by email at halvor@uw.edu. You can also use email to ask any short questions that may arise as you review your notes or work on the problem sets.

There is no textbook for this course. Lecture notes will be posted on the course webpage, which can be accessed through MyUW. Practice exams, problem sets, answers for the problem sets, and other course materials will also be posted there.

Please refer to the next page for very important, information concerning the rules for taking exams as well as policies concerning academic integrity. The exam rules will be strictly enforced.

Exam Rules

I Exam Absence Policy

1. If you are unable to make it to an exam period due to illness or another unexpected happening, do the following:

   i. Notify me no later than the time of the exam that you are not able to take the exam and why.

   ii. If you missed the exam for health reasons, you need to show me a note issued by a medical professional documenting the reason you missed the exam.

   iii. If there was some other reason for missing the exam, come and see me to explain the reason. You will need to show appropriate documentation. Not waking up or missing your bus/plane is not an acceptable excuse.

2. If you know that you are going to be away due to a University-related activity, let me know well in advance so that arrangements can be made.

II Exam Taking Rules

1. Material allowed during an exam.

   i. You must bring a large, blank (inside and out), bluebook for your answers.

   ii. All books, papers, etc., must either be in a securely closed bag or placed out of reach.

   iii. No electronic devices, including calculators, can be accessible during the exam. Cell phones must be turned off before entering the class and placed in your closed bag (not in your pocket). If a student's cell phone is visible at any point during the exam, their exam time will be terminated immediately and they will receive a zero for the exam.

   iv. Baseball caps and any other kinds of headgear that conceal your eyes are not permitted.

2. Attendance and special accommodation

   i. You are not allowed to leave the room during the exam, including for restroom use.

   ii. If you arrive late to an exam, you will still be required to finish by the official end of the exam.

III Academic Integrity

1. Exams are individual work and cheating will not be tolerated. Looking at notes or your neighbors' answers will result in the immediate termination of your exam time and a grade of zero for the exam.

2. Altering an exam before submitting it for a review of the grading, obtaining an advance copy of an examination, or arranging for a surrogate test-taker are all flagrant violations of University policy.

3. The Department will follow University policy in case of academic misconduct, which can be reviewed at http://www.washington.edu/uaa/advising/help/academicintegrity.php. Students found to have engaged in academic dishonesty will be subject to sanctions, which range from a disciplinary warning to permanent expulsion from the University, depending on the seriousness of the misconduct.

Lecture and Exam Schedule

Dates shown for lectures and the mid-term exam may be revised as the Quarter proceeds.

June 19th: Lecture 1

Economic View of the Environment
Technical alternatives for reducing pollution
Market failures
Government failures
Derivation of the standard pollution diagram

June 20th: Lecture 2

Coase Theorem
- Definition
- Amount of pollution
- Equity and fairness
- Policy relevance

June 21st: Lecture 3

Policy design when MB and MD curves are known
- Pigouvian tax
- Per unit subsidy
- Regulation
- Incentives for innovation
- Monitoring and enforcement

June 22nd: Lecture 4

Policy design when MB and MD curves are known, continued
- Monopolistic polluter
- Non-monotonic marginal damages
- Non-convexity of total net benefits
- Concentration of polluting activities

June 23rd: Lecture 5

Policy design when MB and MD curves are not known
- Target vs. efficient level of pollution
- Per unit tax vs. regulation
  - One polluter
  - Multiple polluters
- Tradable pollution permits

June 26th: Lecture 6

Policy design when MB and/or MD curves are uncertain
- MB curve known, MD curve uncertain
- MD curve known, MB curve uncertain
- Both MB curve and MD curve are uncertain
- Examples of applications

Hybrid instrument
Nonlinear tax

June 27th: Lecture 7

Disaggregate pollution
Distributional effects of environmental policies

June 28th: Lecture 8

Political economy of instrument choice
- Gaps between economic theory and political reality
- Political demand for policy instruments
- Political supply of policy instruments

June 29th: Lecture 9

Economic theory of policy evaluation
- Economic efficiency and social welfare
- Criteria for policy analysis
  - Pareto criterion
  - Potential Compensation Criterion
- Marginal utility of income
- Marginal willingness to pay vs marginal utility

Porter Hypothesis

June 30th: Lecture 10

Types of policy analysis
- Environmental impact statement
- Cost-effectiveness analysis
- Regulatory impact analysis

Valuation of risks to life
Value of a statistical life (VSL)

July 3rd: At-home review for first exam

July 4th: Holiday

July 5th: In-class review for first exam

July 6th: First exam covers material through political economy of instrument choice.

July 7th: Lecture 11

Estimation of the value of a statistical life
- Stated preference
- Hedonic estimation
- Compensating wage differentials

Factors affecting VSL
- Attitude toward risk
- Income
- Age

Risk-risk analysis
- Substitution risks

Rebound effects
Implementation risks
Opportunity costs

July 10th: Lecture 12

Water pollution control
Types of benefits
Benefit-cost analysis
Technology based effluent standards
Safe Drinking Water Act
Air pollution control
Regulated pollutants
National Ambient Air Quality Standards
Mobile sources

July 11th: Lecture 13

Stationary sources
Technology based emission standards
Tradable permits for sulfur dioxide
Benefit-cost analysis of air pollution control
Scale of program
Estimation of benefits
Total benefits and costs
Global issues: 1973 perspective

July 12th: Lecture 14

Stratospheric ozone depletion
Causes
Effects
Policy responses
Global climate change
Causes
Effects
Technical alternatives for responding to global climate change
Prevention
Remediation
Mitigation

July 13th: Lecture 15

Instrument choice
Obstacles to effective international agreements
Global versus national net benefits
Allocation of responsibility for the problem
Carbon leakage

July 14th: Lecture 16

Benefit-cost analysis
Social discount rate

Rate of time preference
Opportunity cost rate
Discounting formulas
Applications of discounting formulas

July 17th: At-home review for second exam

July 18th: In-class review for second exam

July 19th: Second exam covers material since first exam.