

**Economics 436**  
**Environmental Economics**  
**Spring 2019**  
**Prof. Robert Halvorsen**

.ECON 436 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.

Two, non-cumulative, exams will count for 70% of the course grade, with the grade for the exam on which you do better receiving a weight of 0.6 and the other exam receiving a weight of 0.4. Last Quarter's exams are posted on Canvas as a preview of the types of questions that will be asked as well as sources of practice questions in studying for this Quarter's exams. **Please refer to the next page for important information on the rules for taking exams and quizzes. Note especially the information concerning cell phones.**

Six in-class quizzes will account for 20% of the course grade. The quiz on which you do least well will not be included in calculating the overall quiz grade.

Eight problem sets will account for 10% of the course grade. Each problem set will be graded credit/no credit. Detailed answer sheets will be provided for the problem sets and quizzes. Previous students have frequently reported that doing the problem sets and reviewing the answer sheets is a very good way to learn the course material.

There is no textbook or course pack for this course. Lecture notes on the topics expected to be covered in class are posted on Canvas. The actual lectures given in class will not always be identical to the posted notes, so attending class is highly recommended. Problem sets, answers to problem sets and quizzes will also be posted.

My office hours during the Spring Quarter are 10:00-11:00 on Monday, Tuesday, and Friday in Savery 351. An appointment to meet at another mutually convenient time can be made in person after class, by phone at 206-543-5546, or by email at [halvor@uw.edu](mailto: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.

## 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, such as participation in an away sport or debate, 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, bluebook for your answers.
  - ii. All books, papers, notebooks, etc., must be placed inside your backpack or other type of bag, which must be securely and fully closed. If you do not have a bag, you must place all your material out of your reach.
  - iii. No electronic devices, including calculators, can be accessible during the exam. Cell phones must be turned off and placed in your closed bag (not in your pocket). **If your cell phone is observed at any point during the exam, your exam will be taken away and assigned a grade of zero.**
  - 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. This includes restroom use; be sure to use the restroom before the beginning of the exam.
  - ii. If you arrive late to an exam, you cannot expect to get extra time after the official end of the exam to make up for the missing time at the beginning.
  - iii. If you have a documented disability, please show me documentation from the Office of Disability Resources for Students early in the Quarter so that I can make any arrangements required for accommodations.

### 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. Cheating of any kind may result in expulsion from the University. The Department will follow University policy in case of academic misconduct. I strongly recommend that you review University policy 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.

## **Course Schedule**

All dates except for the final exam are subject to revision.

### **April 2<sup>nd</sup>**

Introduction  
Derivation of the standard pollution diagram

### **April 4<sup>th</sup>**

Coase Theorem

### **April 9<sup>th</sup>      Problem Set 1 Due**

Policy design when MB and MD curves are known  
Choice of policy instrument  
Incentives for innovation  
Monitoring and enforcement

### **April 11<sup>th</sup>      Quiz 1**

Monopolistic polluter  
Non-monotonic marginal damages  
Non-convex total net benefits  
Concentration of polluting activities

### **April 16<sup>th</sup>      Problem Set 2 Due**

Instrument choice when MB and MD curves are not known  
Per unit tax vs. regulation  
Tradable pollution permits

### **April 18<sup>th</sup>      Quiz 2**

Instrument choice when MB and MD curves are uncertain  
Expected Pigouvian tax vs. tradable permits  
Hybrid instrument  
Nonlinear tax

### **April 23<sup>rd</sup>      Problem Set 3 Due**

Disaggregate pollution  
Distributional effects of environmental policies  
Political economy of instrument choice

### **April 25<sup>th</sup>      Quiz 3**

Economic theory of policy evaluation  
Economic efficiency and social welfare  
Criteria for policy analysis

### **April 30<sup>th</sup>      Problem Set 4 Due**

Marginal willingness to pay vs. marginal utility

Porter hypothesis

**May 2<sup>nd</sup>**

Types of policy analysis  
Valuation of risks to life

**May 7<sup>th</sup>      REVIEW FOR MIDTERM EXAM**

**May 9<sup>th</sup>      MIDTERM EXAM**

**May 14<sup>th</sup>      Problem Set 5 Due**

Risk-risk analysis  
Water pollution control

**May 16<sup>th</sup>      Quiz 4**

Safe Drinking Water Act  
Air pollution control  
    Regulated pollutants  
    National Ambient Air Quality Standards  
    Regulatory policies

**May 21<sup>st</sup>      Problem Set 6 Due**

    Benefit-cost analysis  
Global issues: 1973 perspective  
Stratospheric ozone depletion

**May 23<sup>rd</sup>      Quiz 5**

Global climate change  
    Technical alternatives for responding to global climate change  
    International attempts to reduce climate change

**May 28<sup>th</sup>      Problem Set 7 Due**

    Obstacles to effective international agreements

**May 30<sup>th</sup>      Quiz 6**

Social discount rate  
    Rate of time preference  
    Opportunity cost rate  
    Discounting formulas

**June 4<sup>th</sup>      REVIEW FOR FINAL EXAM**

**June 6<sup>th</sup>      FINAL EXAM COVERS MATERIAL SINCE MIDTERM EXAM**