I. Logistics

Getting Help: I will do my best to have an open door policy two days a week (Monday and Wednesday). My schedule gets very hectic. I have a large number of University required meetings, a busy travel schedule, and a number of people make appointments. So it is sometimes desirable (if you want to be sure to see me within a short period of time) to make an appointment. Don't let problems build up. If you have questions contact me. If my office hours are not good, please make an appointment for another time.

Prerequisite: This class has as a prerequisite EC/ARE 201. You should be familiar with simple algebra and the graphs used in economic principles. I have put a couple of economics books reviewing micro economic principles on reserve. The chapters to look at for quick reviews, if you need to brush up, are:

<table>
<thead>
<tr>
<th>Book</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank, Microeconomics and Behavior</td>
<td>1, 2</td>
</tr>
<tr>
<td>Varian, Intermediate Microeconomics</td>
<td>1</td>
</tr>
</tbody>
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Course Objective: The course will show you how economic principles can be and are used in private and public policy decisions involving environmental resources. Natural
resource management and policy analyses associated with environmental resources require good science background in the relevant areas and a good basis in economic methodologies. To the extent possible, this course will use real problems to illustrate how economic methods can contribute to better decisions.

**Text Book:**

*Environmental Economics and Management: Theory, Policy, and Applications*
Third Edition  (labeled text below)
Scott J. Callan and Janet M. Thomas
(South-Western 2004)

**Supplement:**

*Natural Resource Economics: An Introduction* (labeled Field below)
Barry C. Field
(McGraw Hill 2001)

*Economics of the Environment* (labeled Supplement below)
Fifth Edition
Robert N. Stavins Editor
(WW Norton 2005)

**Attendance, Grading, Policies:**

The class will be a lecture format with your participation encouraged. To assure that participation "happens," a variety of other activities will take place including a few experiments with monetary incentives and in-class problem solving. Attendance is expected, but I will not systematically check the roll. I will present material you will be expected to know for tests and exams that is not in the book or in the supplementary readings.

Early in the semester (with luck in two weeks), I have set up a web page for the class (http://www4.ncsu.edu/~vksmith/). I will put selections from my lecture notes, and a data base of questions I have used on exams. At least fifty percent of the questions on each exam will be drawn from this data base. I will not provide answers for these questions in advance of the exam. Please do not ask. The answers are in the book and reading materials for the class. This resource should provide a study guide so you know what you need to know for the class. I will add new questions to the exam to reflect new materials added to the class since these questions were used.

Grades will be based on two hourly exams, a final exam, class participation, and quizzes that will not be announced in advance.
The weights are:

Hourly exams (2) 40%
Final exam 40%
Participation, quizzes, and optional blogs 20%

The hourly exams cannot be made up! If you miss one, a portion of the weight will shift to the final exam (i.e. miss one hourly and the final exam will count 60% of your final grade).

The hourly exams and final exam are scheduled as follows:

Exam 1: September 21
Exam 2: November 14
Final Exam: December 9 (1 – 4 pm)
[Final Exam will be comprehensive, covering the whole semester's work.]

The performance schedule for grades will be:

90 -- 100 % A
80 -- 89 % B
70 -- 79 % C
60 -- 69 % D

Extra Credit

You have the opportunity to add 24 points to the total points associated with participation and quizzes by preparing a one page reaction (typed and double spaced) to three issues that arise on the environmental economics blog.

Here is how this opportunity works. You select an issue discussed on the blog, develop an argument favoring or opposing what is presented on the environmental issue and write it up. Your argument must be documented with published research (you must include full citations).

Each submission is worth 8 points and must include a copy of the blog, your typed response, and please include references to document your argument. In order to allow me time to read these, each of the three submissions must take place within intervals

First Submission – no later than 10/3
Second Submission – not before 10/3 and no later than 10/24
Third Submission – not before 10/24 and
no later than 11/21

The blog is located at: http://www.env-econ.net/

e-mail

I do not communicate about questions with each student individually through e-mail. You may contact Mr. Crawley to set up appointments via e-mail and I will announce how the TA will handle e-mail communication. I will use the class web page to post material for class. I will e-mail important announcements to you via a class list serve. If your preferred e-mail address is different from the one the university has for you, please print clearly your address and name on a piece of paper with the course number and give it to me during the first week of classes.

II. Course Schedule

Date

8/17 Introduction
  • Text – Chapter 1
  • Fullerton and Stavins – Supplement (Chapter 1)

8/22 Market Experiment

8/24 Review of Market Process and Concept of Efficiency
  • Text – Chapter 2
    
    **Key Concepts:** definition of market, demand and supply functions, opportunity cost, marginal analysis, definition of efficiency, consumer and producer surplus

8/29-8/31 Market Failures
  • Text – Chapter 3
    
    **Key Concepts:** characteristics of private and public goods, willingness to pay, externality, marginal analysis, Coase theorem, benefit-cost analysis
9/5  Labor Day – University Holiday

9/7  Are Market Failures Real?

- “Air Pollution in the World’s Megacities,” Environment, March 1994
- “What’s at Risk? Environmental Influences on Human Health,” Environment, October 2004
- Text – Chapter 6

**Key Concepts:** source/receptor, damage functions/dose-response, voluntary/involuntary risk, risk management

9/12-9/14  Solutions to Environmental Problems

- Text – Chapters 4-5
- Supplement – Freeman (Chapter 30)
- Supplement – Hahn (Chapter 31)

**Key Concepts:** types of standards, marginal abatement cost, command and control versus incentive based, efficient charge, subsidies, pollution permits

9/15  Review Session – first hourly (evening – 5-6:30 pm)

   room – Nelson 3210

9/19  Case Study – SO2 Trading System and EU Experiment

- Text – 269-277
- Stavins (Chapter 17) Supplement
- Sandel (Chapter 18) Supplement
- Replies to Sandel (under 18) Supplement

**Key Concepts:** heterogeneity in marginal abatement costs, cost minimization, incentives to technical change

9/21  First Hourly Exam

9/26-10/3  Benefit-Cost Analysis – Principles
• Text – Chapters 7-9
• Examples

A. Arsenic
Text Chapter 16
R. Wilson, “Underestimating Arsenic’s Risk,” Regulation Fall 2001

B. Clean Air Act
Text Chapter 10
EPA Prospective Analysis – Executive Summary

**Key Concepts:** revealed preference, stated preference, hedonic property value, travel cost recreation demand, present value, discount rate, compensation principle

10/5 No Class

10/10 Popular Debates – *Collapse*

  Chapters 3, 14, 16
• P. Dasgupta, “Bottlenecks”
  London Review of Books, May 19, 2005

10/12 Non-Renewable Resources

• Field, *Natural Resource Economics* Chapter 10

  **Key Concepts:** scarcity rent, user cost, reserves, arbitrage

10/17 Energy

• Field, *Natural Resource Economics* Chapter 11
• Text – Chapter 13

  **Key Concepts:** global commons, stock pollutants, irreversibilities, greenhouse gas intensity

10/19 Renewable Resources – Forests

• Field, *Natural Resource Economics* Chapter 12
Key Concepts: optimal rotation, multiple use management criteria, non timber values

10/24 Endangered Species Policies

- Field, Natural Resource Economics Chapter 19
- Supplement – G. Brown and J. Shogren (Chapter 27)

Key Concepts: Noah problem, object of choice, preservation costs

10/26 No class
10/31 Renewable Resources – Fisheries

- Field, Natural Resource Economics Chapter 13

Key Concepts: open access, maximum sustainable yield, tradable quotas, recreation vs. commercial fishing

11/2-11/7 Hazardous Waste Management

- Text – Chapter 17
- Supplement – Viscusi Chapter 11

11/9 Catch-up (if we fall behind)

11/10 Review Session – second hourly (evening 5-6:30 pm)
    room – Nelson 3210

11/14 Second Hourly Exam

11/16-11/21 Environment and Development

- Text – Chapter 20
- Field, Natural Resource Economics Chapter 21
- Supplement – Solow (Chapter 26)

Key Concepts: collective action, role for property rights, environmental Kuznets, curve sustainability

11/23-11/25 Thanksgiving (no class 11/23)

11/28-11/30 Catch-up (in case we fall behind) and Exam Review