

ENV-520 Resource and Environmental Economics I

Section 1: T/Th 10:05-11:20

Section 2: T/Th 1:25-2:40

Field Auditorium

Fall 2017

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Office Hours: TBA



This course has achieved Duke's Green Classroom Certification. The certification indicates that the faculty member teaching this course has taken significant steps to green the delivery of this course. Your faculty member has completed a checklist indicating their common practices in areas of this course that have an environmental impact, such as paper

and energy consumption. Some common practices implemented by faculty to reduce the environmental impact of their course include allowing electronic submission of assignments, providing online readings and turning off lights and electronics in the classroom when they are not in use. The eco-friendly aspects of course delivery may vary by faculty, by course and throughout the semester. Learn more at <http://sustainability.duke.edu/action/certifications/classroom/index.php>

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Nature and Purpose of the Course

This course provides a survey of environmental economics. The course covers conceptual and methodological topics and applies these skills to current issues in environmental and resource policy. The first part of the course focuses on basic theory and methods of economic analysis of environmental problems. What is the efficient level of environmental protection? How does cost-benefit analysis help determine efficient policies? How is cost-benefit analysis implemented? The second part of the course focuses on the economics of the environment, particularly the economics of pollution control. We will evaluate several different methods for pollution control from an economic perspective.

Prerequisites:

Students are required to have taken an introductory microeconomics course. Students should be familiar with basic microeconomic concepts such as: supply and demand functions, consumer and producer surplus and deadweight loss, opportunity cost, marginal analysis, and time discounting. If you need a refresher I highly recommend the following text:

Mankiw, N. Gregory *Principles of Microeconomics* (Fort Worth, TX: Harcourt College Publishers).

There is a new edition of this book nearly every year. Any edition will suit your purposes, so I encourage you to buy used and save some money.

Students must also have taken one semester of college-level calculus. Students should be familiar with basic calculus concepts such as derivatives, integrals, and pre-calculus concepts such as logarithms and exponentials.

For review I recommend a text by Gilbert Strang which is available free through MIT OpenCourseware at:

<http://ocw.mit.edu/ans7870/resources/Strang/strangtext.htm>

Required Readings:

There are two required books for the course. Throughout the syllabus these readings will be abbreviated as KO and STAVINS. You will be happy to know that together these two books are just slightly over \$50.

KO: Keohane, Nathaniel O. and Sheila M. Olmstead. *Markets and the Environment: 2nd Edition* (Washington, D.C.: Island Press, 2016). [First edition is also acceptable.]

EOE: Stavins, Robert N., ed. *Economics of the Environment: Selected Readings, Sixth Edition*. (New York, NY: W.W. Norton & Company, 2012).

In addition, there are several articles or handouts that will be available either through E-Reserves or on Blackboard. These articles are marked with an asterisk (*).

Optional Textbook (the latest edition (7th edition) is close to \$200, but you can pick up the 6th edition for much less online)

TL: Field, Barry and Martha K. Field (2012). *Environmental Economics: An Introduction* (New York, NY: McGraw Hill)

Problem Sets

There will be three problem sets. All problem sets are at the beginning of class on the date assigned in the syllabus. Problem sets should be written out neatly (math is easier to write out rather than type) or printed out. **Late problem sets must be scanned and submitted by email to your Head TA.** Late work will be marked down 10% for every day (or part of a day)

that they are late. The time stamp on the email will serve as the official time of submission for late problem sets.

The problem sets will be quantitative in nature involving algebra, calculus, and using Excel to do more complicated calculations. I encourage you to work in your study groups on these problem sets and help each other learn. However, each student **must submit his or her own copy of the assignment and you are not allowed to directly copy another student's work. You may NOT use any materials from prior offerings of this course to assist you in completing your assignments.**

An example of appropriate problem set collaboration would be for Student A to explain the calculus used in the problem to Student B. Then Student B goes off on his own and completes the problem again and writes up his own explanation. It would be inappropriate for Student B to directly copy the math or the explanation/interpretation directly from Student A.

In my experience, study groups are most effective when everyone attempts to do the problem sets BEFORE meeting as a group. Only if you really try to solve the problem on your own will you realize whether you understand the problem and its solution. It is very easy to hear someone's explanation and think you understand the problem, but on the exams you will not have the benefit of your study group so get in the habit of completing the first round of the problem sets on your own. This will also help insure that you are using the study group in ways that are consistent with the Nicholas School Honor Code. **All potential violations of the honor code will be reported to the Director of Professional Studies for adjudication (or the Office of Student Conduct for undergraduates).**

Quizzes and Exams

There will be two quizzes and one exam. Quizzes will take place during the first 15 minutes of class on Sept. 12 and Sept. 26. The exam will take the entire class on Oct. 5. Quizzes and exams are closed book/note. You may bring a calculator. You will not need blue books.

Grading

Grades will be computed as follows:

3 Problem Sets	30% (10% each)
2 Quizzes	30% (15% each)
Exam	40%

Letter Grades will be assigned based on weighted grade in the course using the following base schedule:

A+	>=98%
A	94-97
A-	90-93
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
F	<70

Professor Benneer reserves the right to curve grades, based on difficulty of the exams/quizzes in a particular year, but curves will only serve to improve letter grades relative to the above base schedule.

Short-Term and Long-Term Illness

You do not need to notify me if you are ill and will miss one class. All classes are recorded with Panopto and you can view missed classes on the Sakai site. Professor Benneer will not meet with students to go over material missed in class. You are expected to watch the missed lectures and get notes from other students to make up missed classes.

Remember that if you are sick Duke asks that you refrain from attending classes so that illness spreads less rapidly. If you have a fever of greater than 100 degrees Fahrenheit, please do not attend class until you have been free of fever for 24 hours.

If you are ill and cannot complete an assignment on-time, please email me BEFORE the assignment is due.

If you are ill on exam day, please email Prof. Benneer before the beginning of the exam to make arrangements.

Nicholas School Honor Code

All activities of Nicholas School students, including those in this course, are governed by the Duke Community Standard:

The Duke Community Standard

Duke University is a community of scholars and learners, committed to the principles of honesty, trustworthiness, fairness, and respect for others. Students share with faculty and staff the responsibility for promoting a climate of integrity. As citizens of this community, students are expected to adhere to these fundamental values at all times, in both their academic and non-academic endeavors.

The Pledge

Students affirm their commitment to uphold the values of the Duke University community by signing a pledge that states:

1. I will not lie, cheat, or steal in my academic endeavors, nor will I accept the actions of those who do.
2. I will conduct myself responsibly and honorably in all my activities as a Duke student.

Lecture and Reading Schedule

WEEK 1:

Aug 29: Environmental Economics Overview

Required Readings:

KO: Chapter 1

EOE: Chapter 1 – Fullerton and Stavins, “How Economics See the Environment,”
Nature, 1988.

August 31: Market Failures – the basis for Environmental Economics

Required Readings:

KO: Chapters 4 & 5

WEEK 2:

Sept 5: Static and Dynamic Efficiency

Required Readings:

KO: Chapter 2 and Chapter 3, pages 43-53.

EOE: Chapter 11 – Arrow, et al., “Is There a Role for Benefit-Cost Analysis in
Environmental, Health and Safety Regulation?” Science, 1996.

EOE: Chapter 14 – Kelman “Cost-Benefit Analysis: An Ethical Critique.” Regulation,
1981 with replies by DeLong, Solow, Butters, Calfee, and Ippolito.

EOE: Chapter 15 – Graham “The Evolving Regulatory Role of the U.S. Office of
Management and Budget”

Sept. 7 Benefits Estimation – Revealed Preference

Problem Set #1 Due

Required Readings:

KO: Chapter 3, pages 31-43.

WEEK 3:

Sept. 12: Benefits Estimation – Stated Preference

Quiz 1 – Covers Material Through Sept. 6

Required Readings:

EOE: Chapter 7 – Portney “The Contingent Valuation Debate: Why Economists Should Care,” *Journal of Economic Perspectives*, 1994.

EOE: Chapter 8 – Hanemann, “Valuing the Environment through Contingent Valuation,” *Journal of Economic Perspectives*, 1994.

EOE: Chapter 9 – Diamond and Hausman, “Contingent Valuation: Is Some Number Better than No Number?” *Journal of Economic Perspectives*

Sept 14: Benefits Estimation – Valuing Morbidity and Mortality

Required Readings:

EOE: Chapter 10 – Cameron “Euthanizing the Value of a Statistical Life,”

WEEK 4:

Sept 19: Cost Estimation

Problem Set 2 Due

Required Readings:

Chapter 8 of Guidelines for Preparing Economic Analyses (Washington, D.C.: U.S. Environmental Protection Agency, 2010) –
[http://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0568-08.pdf/\\$file/EE-0568-08.pdf](http://yosemite.epa.gov/ee/epa/eerm.nsf/vwAN/EE-0568-08.pdf/$file/EE-0568-08.pdf)

EOE: Chapter 5 – Porter and van der Linde (1995) “Toward a New Conception of the Environment-Competitiveness Relationship,” *Journal of Economic Perspectives*, 9(4): 97-118.

EOE: Chapter 6 – Palmer, Oates and Portney (1995) “Tightening Environmental Standards: The Benefit-Cost of the No-Cost Paradigm?” *Journal of Economic Perspectives*, 9(4): 119-32.

Sept 21: Economics of Pollution Control I – Rosh Hashanah Lecture by TAs with prior lecture from Dr. Benneer on Panopto (see Sakai site for link to lecture)

KO: Chapter 8 (except for pages 145-151)

WEEK 5

Sept 26: Economics of Pollution Control II

Quiz 2 – Material from Sept 8-20

Required Readings:

KO: Chapter 8, pages 145-151

EOE: Chapter 13 – Pindyck “Uncertainty in Environmental Economics”

Sept 28: Economics of Pollution Control III

Required Readings:

EOE Chapter 16: Goulder and Parry, "Instrument Choice in Environmental Policy"

WEEK 6

Oct 3: Market-Based Instruments in Practice

Problem Set 3 Due

Required Readings:

KO: Chapters 9-10

EOE: Stavins Chapter 17 "What Can We Learn from the Grand Policy Experiment"

Oct 5: In class exam