ENVIRONMENTAL ECONOMICS

Econ 4545
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Course Description

Environmental Economics (Econ 4545) considers the efficient and equitable use of society's scarce environmental resources. Environmental resources include air, water, land, wilderness areas, parks, wildlife and genetic diversity, and other ecological systems. The environment is where we get the stuff that sustains us and determines, to a large extent, the quality of our lives.

Environmental economics accepts, without much discussion, efficiency and equity as goals for environmental policy. Note that many environmentalists do not accept efficiency and equity as the appropriate measures of whether an environmental policy is good or bad.

Environmental economics is a course in applied welfare economics (how to increase the welfare of society). The direct goal is to make society better off, this might mean preserving more of an environmental resource; it might mean preserving less of it. The course will consider market failures (particularly externalities and common property resources), and the economic valuation of environmental amenities such as clean air, wilderness and ecological systems.

Use of environmental resources will be considered from four perspectives: the market allocation (how the market would allocate them if it were left to its own devices, efficient allocations, equitable allocations, and government attempts to achieve more efficient and more equitable allocations.

Courses in environmental economics and natural resource economics both consider natural resources but differ in that natural resource courses have historically dealt with the inter-temporal utilization of conventional renewable and nonrenewable natural resources such as energy, minerals, tress and fish; whereas environmental courses have considered pollution and other environmental issues, historically from a static perspective. This historical distinction is blurring.

Before we begin, I want to make a few comments about what economics is not. Economics is not about making money or how to run a firm. Economics is the study of the allocation of society's scarce resources. Economics per sec is not pro-market or pro-government. The purpose of this course is not to argue that government action to protect the environment is bad or good; sometimes it is bad, sometimes it is good.

The purpose of this course is not to extol the virtues of the market. Markets have many virtues, but, when it comes to the environment, they also have many faults. In some ways, this course could be described as a course on market failures and government actions to correct those failures.

An important component of environmental economics is estimating the costs, in $, of decreasing pollution, cleaning up the environment and protecting scarce ecological systems such as wetlands and wilderness. I want to stress that, equally important, environmental economics is estimating the benefits of decreasing pollution, cleaning up the environment and protecting scarce ecological systems. Not surprisingly, polluters tend to play up the costs of cleaning up and downplay the benefits of cleaning up

I do a lot of research, theoretical and applied, on estimating the benefits of environmental improvements. An important issue is the costs and benefits to whom.

Note that a lot of environmentalists reject the idea valuing the environment is $ and even the ideal that the value of the environment can be quantified.

Environmental economists don't consider society's production and distribution of goods and services as separate from the environment; put simply, we take from the environment to produce our goods and services, and, ultimately it ends up being emitted back into the environment in terms of emissions, pollution and wastes. Very simply, the total weight of what is taken from the environment to produce goods and services must eventually equal to weight of what we put back into the environment ("what goes in must come out"). This fact is often referred to as "materials balance". The same balance holds for energy – we change its form but do not create or destroy energy. Production and consumption change the form of matter and the form of energy but, with the exception of nuclear reactions, no matter or energy is created or destroyed. The word consumption is a misnomer; when you eat a Big Mac, nothing is destroyed. Materials balance is of critical importance but it is not stressed in your other economics courses.

Details

Web page: My web site is located at http://www.colorado.edu/Economics/morey/index.html . From it you can link to the web page for Econ 4545, or you can go directly to the web page for the course, http://www.colorado.edu/Economics/morey/4545/4545home.html

> Many past and current assignments, review questions, and, hopefully, most of the readings will be made available at this site on an as-need basis.
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> You may also want to visit the web sites for the other natural resource and environmental courses that I teach. You will find a lot of overlap. My undergraduate natural resources course for economics majors can be found at http://www.colorado.edu/Economics/morey/4535/4535home.html . I have not taught it for a while.
> My natural resource and environment course for M.A. students (the M.A. program is now extinct) is at http://www.colorado.edu/Economics/morey/6535/6535home.html , and my PhD level environmental course at http://www.colorado.edu/Economics/morey/8545/8545home.html

I also teach a course called *Economics, Ethics and the Environment*. That course questions many of the assumptions we make in Econ 4545, assumptions that are also made in your other economics courses. The web page for that course is http://www.colorado.edu/economics/morey/4999Ethics/4999ethics-home.html

Review questions and problems will be handed out for each section of the course – old versions of the review questions are already on the web page. I will advise you by email whenever I revise a set.

I strongly encourage you to write out answers to these questions and discuss them with your classmates. You will want to form study groups. Your grade will be **highly correlated** with your understanding of the review questions—don't confuse familiarity with understanding. On exams and quizzes, I expect your answers to be well written; it is important, for life, to be able to write well. Improvement comes with practice and I will give you ample opportunity to practice. **One might describe my role as facilitating your understanding of the review questions.**

Writing well is a necessary condition for doing well in the course. If writing is not your strong suit, you might consider ……

Final: There will be a comprehensive final

Midterm: It will be comprehensive up to that point in the course.

Assignments: There will be N short exams assignments (quizzes, small projects, problems, debates, etc.) during the term, Use the review questions to study for the quizzes.

Note that **I do not give make-up quizzes**. Please don't ask. There will be a bunch of quizzes, and your 2 lowest grades on these quizzes will be dropped, so you can miss or mess up two quizzes without penalty.

Some of the assignments will be in-class; some will be take-home. Some of the assignments will be done in groups. The group, usually three people, will work together and turn in just one assignment. Everyone in the group will get the same grade for that assignment. Group assignments are one of my ways of giving you an incentive to work and study together.

Final: Comprehensive final which will constitute 35% of your course grade.

Midterm: The midterm will constitute 25% of your course grade

Assignments: best (N-2) of these assignments will constitute 40% of your course grade.

Class participation: If at the end of the term I recognize you as someone who has contributed positively I will increase you final grade by some appropriate amount. Ways

to contribute include asking or answering questions, attendance, participating in class discussions, and helping other students to learn the material.

If you get an A on the midterm, you can make a private arrangement with me to do a course paper/project. How much the paper will count will depend on our arrangement. If you are doing well in the course and like to write and do research, this is something I highly recommend

Some papers by past student of Econ 4545 and Econ 4535 can be found on the web page for Econ 4535(http://www.colorado.edu/Economics/morey/4535/4535home.html) I look forward to including your excellent paper or web project on the page.

If you are interested in writing a paper see
http://www.colorado.edu/economics/morey/4545/4545assg.html

I grade on the following scale:

90% = A
80% = B
70% = C
60% = D
59% = F

In past semesters, some students, not many, have earned a D or an F, and have gotten that grade. I hate doing this, but will if that is the grade earned.

I try to grade on the basis of standards rather than on the basis of a curve. Everyone, in theory, can get an A. That said, the Department has grading guidelines: I am supposed to aim for a course average grade of around 76% (middle to high C, so would get in trouble if every semester I gave mostly A's

Office hours: My office hours will on Tuesday from 3:30 to 4:30, Wednesday from 10:30 to 12:00, and by appointment. If you can't make it to the office hours, catch me after class to schedule a time. My office is Econ 122. Please feel free to contact me by email Edward.Morey@Colorado.edu about setting up an appointment. Sometimes it will take a day or so for me to get back to you.

I will often communicate important information (e.g. announce a quiz) to you by email sent to your CU email account. I have learned from years of experience to not send emails to addresses like HotRodStud@excite.com.

Prerequisites: Intermediate Micro Theory (C.U. Econ. 3070), and Econ 1078 and 1088 (or fulfillment of one of the more rigorous ways to fulfill the mathematics requirement for the major). I will use calculus in the course. Materials learned in 3070 will form a foundation for what we will do in 4545. I will cover the micro theory in my lectures, but cover it more quickly than when it was presented to you in intermediate microeconomic theory. It is important that

you have successfully completed Intermediate Micro Theory.

While this is not a micro- theory course, economics without theory is not economics. You will need micro theory to understand and explain the allocation of environmental resources. Some of the theory and terms you will need to know include: the *theory of the firm*, the *theory of the consumer*, *efficiency*, *equity*, when the market equilibrium will and won't be efficient, *market failure*, types of market failures, corrections for market failure, *discounting* and *present value*, *materials balance*, *public goods*, *property rights*, *common property*, *externalities*.

A strong math background will make this course easier. Math involves rigor and a way of thinking that facilitates economic thinking. In addition, graphs and simple mathematical descriptions of economic problems provide insights that would be difficult to convey with only words.

Readings:

There is no course text book. If you want a reference text, I recommend Tom Tietenberg's *Environmental and Natural Resource Economics*. I will not directly lecture from this book. Rather consider it a standard undergraduate text on the topic of environmental economics. If you bring me the book, or some other undergraduate text in environmental economics, I will try and tell you which chapters are relevant to the topics and issues we are discussing. Don't consider Tietenberg a substitute for either the course readings or class time. It is another way to study environmental economics.

Your required readings consist of journal articles, magazine articles and newspaper articles. They vary in length from a few newspaper columns to twenty-page journal articles. Some of these articles will be discussed it class.

I will often draw review questions from these articles. You are responsible for the material in all of the articles for each section of the outline that is covered in class, even though not all of the readings will be explicitly discussed in class.

Many of these articles were suggested by students. I encourage your comments and feedback on these readings. Bring me articles (preferably email them to me as attachments in .pdf or .html) you feel would be good class readings, and tell me which of the current readings have the greatest value and which have the least value.

> The *New York Times* is a very good source of articles about the environment, particularly the *Science* section on Tuesdays. *The New York Times* is also available for free on the web (www.nytimes.com). You can also search by topic for articles previously published in the New York Times.

I am in the process of trying to get all of the class readings onto the web page for the course. The articles on the course web page are in either .pdf or .html format. Note that some of these files are large. See the course web page for details.

I will be revising and updating the list of articles during the semester.

Note that much of the material I will present in class does **not** appear in any of the readings.

Applications/topics: Some of the applications/issues/topics we are likely to consider include extinction, pollution permits, parks and wilderness areas, valuation (travel-cost, contingent valuation, and choice experiments), global warming, conservation, mobile-source pollution (from cars and trucks), and acid deposition.

Class format: View the readings and my lectures as complements rather than substitutes.

A lot of the basic material that you will be responsible for will be presented in lecture and is material that is not explicitly in the readings, so class attendance is imperative. Class time will be devoted lectures, problem solving and discussions. It is important that you do the appropriate readings before each lecture. Some class time will be devoted to working on the review questions. Prepare for these review sessions by answering the questions to the best of your ability. I will ask a lot of questions and will sometimes offer extra credit for correct answers. Expect to be called on.