

## 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.

Use of these resources will be considered from four perspectives: the market allocation, efficient allocations, equitable allocations, and government attempts to achieve more efficient and more equitable allocations.

Environmental economics is a course in applied welfare economics (how to increase the welfare of society). It will consider market failure (particularly externalities and common property resources), and the economic valuation of environmental amenities such as clean air, wilderness and ecological systems.

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 fish, trees and minerals; whereas environmental courses have considered pollution and other environmental issues 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 se 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 its bad, and 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.

Environmental economics is about measuring the costs of decreasing pollution, cleaning up the environment and protecting scarce ecological systems such as wetlands and wilderness. I want to stress that environmental economics is also about measuring the benefits of decreasing pollution, cleaning up the environment and protecting scarce ecological systems.

Society's production of goods and services and the distribution of those goods and services should not be considered as separate from the environment; put simply, what we take from the environment to produce our goods and services ultimately ends up 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.

### 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, sometimes on an as-need basis.

You will 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. The undergraduate natural resources course for economics majors can be found at

<http://www.colorado.edu/Economics/morey/4535/4535home.html> .

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>

*Review questions and problems* will be handed out for each section of the course. 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 you knowledge of the review questions. I will 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.

*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 out 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.

*Paper/web page:* (described below)

There are two paths for the course: one with a paper/project, one without.

For those who choose **not** to do a paper/project

*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.

*Paper/web page:* 0%

For those who choose to do a project:

*Final:* Comprehensive final which will constitute 25% of your course grade.

*Midterm:* The midterm will constitute 15% of your course grade

*Assignments:* best (N-2) of these assignments will constitute 35% of your course grade.

*Paper/web page:* 25% of your course grade.

*Paper/web page:* If you choose the paper option you will write a short paper (5-10 pages - no more). Your paper will be generated in a number of assignments. I will put the best of the papers on the course web page.

There will be a number of assignments/steps associated with the paper (topic, abstract, outline, draft, etc). While I will not explicitly grade these, if you miss one of these assignments (there will be a specific due date for each) the paper option will no longer be available to you and you will default to the no-paper route.

*More on the paper:* One advantage of the web is that you can include links in your paper to related material. Numerous formats are possible. For example, you could write a standard paper in a word processor such as Word, including the links. I would then convert it into a PDF document for publication on the course web page. Alternatively, you could create a web page in html.

Choose some environmental problem and evaluate it in economic terms. Please discuss your topic with me. Once you have settled on a topic, do a rough outline and come see me again. The final copy of your paper will be due in my office on the day of the final. You will need to get a preliminary version to me (your best shot) two weeks before the end of the term. I will get it back to you within a week with comments. There will be number of assignments having to do with your paper topic.

I am fairly flexible about what constitutes a paper, with the provision that it has economic and environmental content. It could be a group endeavor; if so, I would require effort commensurate with the size of the group. What is important to me is to see that you have taken the theory you have learned in class and can apply it to gain insight into some environmental problem or issue that is of interest to you. For example, choose an environmental market failure that interests you, explain why the market failed, and suggest policies for improving the situation. Alternatively, choose some pollutant and critique how it is regulated. I want to see you thinking like an economist. References to all the materials you utilize are necessary.

I am particularly fond of papers/projects on local issues. Thousands of papers will be written on global warming; maybe only one, yours, will be about the impact of the parking fees in Boulder Mountain parks (actually this one has already been done). With a local issue you are the only one investigating it from an economic perspective, and you have the opportunity to talk to the people involved. With local issues, the details often jump out, forcing you to be more responsive to real world considerations.

Some interesting papers in the past have been on such topics as: "Do We Really Need Bighorn Sheep," "The Economics of Whaling," "The Economics of Outer Space," "Recycling," "The Love Canal," "The Harp Seal Hunt," "Wilderness Management," "Boulder Mountain Parks," "Deforestation," "Regulating Mountain Biking," "Ski Area Development," "Two Forks Dam," "Management in the Holy Cross Wilderness area," "Vasquez: The Proposed Expansion of Winter Park," "Oxygenated Fuels and the Front Range," "Rafting on the Arkansas," Boulder Open space," Wood-burning Stoves," hunting and fishing in Colorado, etc.

**Keep in mind** that you will likely not have the resources or time to do a complete study. For example, you will not be able to estimate the benefits and costs of some ski area development. Rather a good paper on this topic would discuss how one might measure such benefits and costs if one had the time and resources. It might, for example, develop a survey instrument.

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.

*I grade on the following scale:*

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

I grade on the basis of standards rather than on the basis of a curve. Everyone can get an A.

*Office hours:* My office hours will on Monday from 1:00 to 2:30. Wednesday from 8:30 to 9:30, and by appointment. If you can't make it to the office hours, catch me before or after class to schedule a time. My office is Econ 122. Please feel free to contact me by email [Edward.Morey@Colorado.edu](mailto:Edward.Morey@Colorado.edu) about setting up an appointment. Sometimes it will take a day or so for me to get back to you.

*Prerequisites:* Intermediate Micro Theory (C.U. Econ. 3070). I will use some calculus in the course. Materials learned in 3070 will form a foundation for what we will do in 4545. I will cover the basic theory in my lectures, but, in general, cover it more quickly than when it was presented to you in intermediate microeconomic theory.

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

And, while this is not a micro- theory course, economics without theory is not economics. You will need 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.*

*Readings:*

I have not ordered a text for the course. 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 ask, I will tell you which chapters are relevant to the topics and issues we are discussing. Don't consider it a substitute for either the course readings or class time. However, 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 in 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. You can subscribe for the semester at Jones Drugs. *The New York Times* is also available for free on the web ( [www.nytimes.com](http://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 to 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.