

## EBGN 570: Environmental Economics

Spring 2017

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**Class Meetings:** TR, 3:30-4:15p, EH 211

**Office Hours:** Wednesdays, 1-4p or by appointment

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**Course Website:** [http://www.mines.edu/~jcarbone/EBGN\\_570\\_s17/](http://www.mines.edu/~jcarbone/EBGN_570_s17/)

**Instructional activity:** 37.5 hours lecture, 0 hours lab, 3.0 semester hours

**Course designation:** Elective

### Course description:

This is a graduate seminar on topics in environmental economics. The only prerequisite for the course is a firm command of graduate-level microeconomic theory (as evidenced by successful completion of EBGN 511, for example.) We'll also read a number of articles which feature econometric analysis, so a working knowledge of modern econometric techniques will be helpful. However, the emphasis will be on economic concepts and not the technical details of the statistics.

Environmental economics focuses on the design of regulations to correct externalities that stem from the provision of environmental quality. Thus the major themes of the course are the application of concepts from welfare economics and public economics to environmental policy issues, the use microeconomic theory to characterize the incentives faced by stakeholders in different regulatory regimes, and empirical analysis of environmental problems. An important theme of empirical analysis in the field is how to value environmental quality as an input to benefit-cost analyses. In addition to developing an understanding of the major issues covered by the field, students will learn how to read and critique academic journal articles and to identify opportunities for new research at the frontier the field.

### Textbook and/or other requirement materials:

- Required text: None
- Recommended text: Charles D. Kolstad, *Environmental Economics*, 2nd edition. (Oxford University Press, 2010).
- Other required supplemental information: Course materials distributed via the course website or as books on reserve at Arthur Lakes Library.

### Student learning outcomes:

At the conclusion of the class students will. . .

1. Have an understanding of the major themes cover by the field of environmental economics.
2. Be able to read and critique academic journal articles from the field.
3. Be able to identify research questions at the frontier of the field.

Brief list of topics covered:

1. Principles of welfare economics, public economics and applied microeconomic theory
2. Theory and empirics of environmental regulation
3. Environmental valuation

Course Format:

Our class meetings will consist of a mix of lecture and class discussion. Typically, I (the instructor) will spend the first class meeting of the week lecturing on the topic du jour. The second class meeting per week will focus specifically on a single, assigned reading (marked with "\*\*\*" in the list of readings on the course website.) You (the student) will write a referee report (approximately 800-1000 words each) on each of these focus readings, to be turned in to me before the class meeting at which we will discuss it.

Referee Reports & Class Presentation:

In your reports, you must answer the following questions:

- What is the research question described in the article?
- Why is this an important question for economists (and humanity) to try to answer?
- What is the main result?
- What is the basic strategy the authors use to address the question?
- Do you think this strategy is appropriate? Why or why not? In particular, are there aspects of the design that might invalidate the authors' interpretation of the results?
- How should this result guide future research in this area?

The organization of your reports should reflect these priorities with clear subheadings that indicate where you have answered each question. I expect the reports to be written professionally (i.e. they should be written in clear, grammatically correct English, properly referenced, and written in a style consistent with the production of a professional document like the journal articles you are reading for class.) You will submit your reports electronically in PDF format before the class meeting in which we will discuss the reading it covers.

You will also give a class presentation on one or two of the focus readings. The presentations should follow the same structure as the referee reports and aim to facilitate class discussion. I will randomly assign you dates to present. If you wish to trade dates/papers with a classmate, you are welcome to negotiate a trade. Please let me know in advance if you make a trade. You may prepare slides to help structure your talk but this is not a necessary condition for giving a successful presentation. Please allow ample time for class discussion; as a general rule, you should plan to talk for less than 45 minutes.

Final Research Paper & Presentation:

In the final research paper, you will identify a research question from the field of environmental

economics. For master's students, your paper should develop a thorough review the existing literature seeking to answer your question. For PhD students, your paper should present an original research proposal. That is, you should identify an original research question, place it in the context of the existing literature, and propose a strategy for answering the question. As part of proposing a strategy, you need identify the specific techniques you would employ to answer the research question and demonstrate a clear path to execution. You will not actually carry out the research plan as part of the assignment.

The paper should be approximately 2000 words in length and is subject to the same professional standards as the referee reports described above.

To help you get started with the final paper project, you are required to submit a 1-page proposal in which you explain what your research topic is and why you think it is suitable for the assignment (as judged by the criteria for the project outlined above.) The proposal is due by March 2. You will then submit a first draft of the paper by April 6 on which I will give you feedback. The final draft of your paper is due at our last class meeting of the semester.

We will spend the last three weeks of the semester giving student presentations on our final project topics. You should aim to talk for approximately 20 minutes with some of this time allocated for questions from the audience.

#### Evaluation:

Final grades will be based on general class participation (coming to class and being an active participant in class discussions), approximately weekly referee reports, and a class presentation based on one of the assigned readings for the course (80% collectively) and a final research paper and presentation (20%).

#### Grading Procedures:

Assignments and exams are marked on a numerical (percentage) basis, then converted to letter grades. The course grade is then calculated using the weights indicated above. As a guide to determining standing, the following letter grade equivalence will generally apply:

A+	97-100	B	83-86	C-	70-72
A	93-96	B-	80-82	D+	67-69
A-	90-92	C+	77-79	D	60-66
B+	87-89	C	73-76	F	<60

Students must successfully complete all components of the course to successfully complete the course. At the instructor's prerogative, remedial assignments for partial credit may be requested of students who have attempted term work without achieving passing grades. Any work which is not attempted and submitted will be assigned a grade of zero.

There is no final exam scheduled for this course. There will be a final written project which will be due on the last day of classes.

#### Notes:

Students seeking reappraisal of a piece of graded term work (term paper, essay, etc.) should discuss their work with the Instructor within 15 days of the work being returned to the class.

#### Coursework Return Policy:

Graded coursework will be returned to students within two weeks of the date it is submitted for evaluation.

Absence Policy (e.g., Sports/Activities Policy):

You are required to attend lecture. Notification of planned absences must be given to the instructor in advance.

Common Exam Policy (if applicable): N/A

Policy on academic integrity/misconduct:

The Colorado School of Mines affirms the principle that all individuals associated with the Mines academic community have a responsibility for establishing, maintaining and fostering an understanding and appreciation for academic integrity. In broad terms, this implies protecting the environment of mutual trust within which scholarly exchange occurs, supporting the ability of the faculty to fairly and effectively evaluate every student's academic achievements, and giving credence to the university's educational mission, its scholarly objectives and the substance of the degrees it awards. The protection of academic integrity requires there to be clear and consistent standards, as well as confrontation and sanctions when individuals violate those standards. The Colorado School of Mines desires an environment free of any and all forms of academic misconduct and expects students to act with integrity at all times.

Academic misconduct is the intentional act of fraud, in which an individual seeks to claim credit for the work and efforts of another without authorization, or uses unauthorized materials or fabricated information in any academic exercise. Student Academic Misconduct arises when a student violates the principle of academic integrity. Such behavior erodes mutual trust, distorts the fair evaluation of academic achievements, violates the ethical code of behavior upon which education and scholarship rest, and undermines the credibility of the university. Because of the serious institutional and individual ramifications, student misconduct arising from violations of academic integrity is not tolerated at Mines. If a student is found to have engaged in such misconduct sanctions such as change of a grade, loss of institutional privileges, or academic suspension or dismissal may be imposed.

The complete policy is online.

## Course Outline:

1. The Environment and Economics [Weeks 1-2]
  - Scope of the Problem
  - Positive vs. Normative Analysis
  - Social Choice
2. Review of Empirical Methods [Week 3]
  - Reduced-Form Estimation
  - Structural Estimation and Calibration
  - Reduced-Form vs. Structural Approaches
3. Externalities & Public Goods/Bads [Week 4]
  - Public Goods and Externalities
  - Voluntary Provision of Public Goods
4. Environmental Regulation [Weeks 5-7]
  - Standards, Taxes & Subsidies
  - Tradable Emission Permits
  - Interactions between Environmental Policy and the Fiscal System
  - Effects of Uncertainty & Price vs. Quantity Instruments
  - Voluntary Measures
  - Innovation
  - Energy Efficiency
  - Risk, Liability, Uncertainty and Irreversibility

*President's Day Break — no class February 21*

*Final Project Proposals Due: March 2*

5. Climate Change [Week 8-9]
  - Climate Policy, Discounting, and Decision Making
  - Carbon Leakage and Unilateral Mitigation Efforts
  - Estimating the Impacts of Climate Change on Agriculture

*Final Project First Draft Due: April 6*

*Spring Break — no class March 28, 30*

6. Non-market Valuation [Weeks 10-14]

- Demand for Environmental Goods and Services
- Hedonics
- Equilibrium Sorting
- Household Production: Travel Cost and Averting Expenditures
- Constructed Markets
- Voluntary Mechanisms

7. Final Project Presentations [Weeks 15-17]

*Final Project Due: May 4*