EBGN 470/570: Environmental Economics, Spring 2019

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Contents

1 Logistics

- Class meetings: MW, 3-4:15p, Engineering Hall 211
- Office hours: MW, 11a-1p or by appointment
- Contact info: Email: jcarbone@mines.edu, Phone: x2175, Office: EH 311

- Course website: `http://www.mines.edu/~jcarbone/EBGN_470_s19/`[1]

2 Description

This is a seminar on topics in environmental economics. 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 characeterize the incentives faced by stakeholders in different regulatory regimes, and empirical analysis of environmental problems. In addition to developing an understanding of major issues covered by the field, students will learn how to read and write about scholarly work.

The only prerequisite for the course is a firm command of intermediate microeconomic theory (as evidenced by successful completion of EBGN 301, for example.) We will also read a number of articles which feature econometric analysis, so a working knowledge of econometric techniques will be helpful. However, the emphasis will be on economic concepts and not the technical details of the statistics.

3 Student learning outcomes

At the conclusion of the class students will...

1. Have an understanding of the major themes covered by the field of environmental economics.
2. Be able to read and develop oral and written critiques of research from the field.
3. Have in-depth knowledge of the subject covered by the final project.

4 Brief list of topics covered

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

[1] I do not typically use Canvas for anything except keeping you abreast of your grades in the course. All course materials will be administered through the course webpage.

3. Non-market valuation

5 Format

Our class meetings will consist of a mix of lecture and class discussion. Typically, I 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 below.) You will write short reports (approximately 600-800 words each) on each of these focus readings, to be turned in to me before the class meeting at which we will discuss it. There will be approximately 8 such reports assigned over the course of the semester.

5.1 Article reports & class presentation

In your report, you should 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 are the main findings?
- What are the basic strategies described by the authors to address the question? (Not the technical details but, rather, the intuition behind the strategy.)
- Do you think these strategies are appropriate from a scientific perspective? Why or why not? In particular, are there aspects of the design that might change the authors' interpretation of the results?

The organization of your report 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 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. Here is an example of a successful report written by a student in the past.

Small groups of students will also give a class presentation on one of the focus readings over the course of the semester. The presentations should follow the same structure as the reports and aim to facilitate class discussion. I will randomly assign you dates to present. If you wish to trade dates/papers with another group, 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.

5.2 Final research paper & presentation

In the final research paper, you and a partner (of your choosing) will identify a research question from the field of environmental economics. For EBGN 470 students, your paper should develop a thorough review the existing literature seeking to answer your question. For EBGN 570 students, your paper should identified an *original* research question and develop a research design for answering it. The paper should be approximately 2500 words in length and is subject to the same professional standards as the article 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. The proposal is due by March 20 and you must subsequently present your topic to the class at the end of the semester. The final draft of your paper is due a week after 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 where the other students and I will give you feedback that may be helpful as you prepare the final draft of your paper. You should aim to talk for approximately 35 minutes with some of this time allocated for questions from the audience.

5.3 Evaluation

Final grades will be based on general class participation (coming to class and being an active participant in class discussions), approximately 8 article 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%).

5.4 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 during the exam period.

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.

5.5 Coursework Return Policy

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

5.6 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.

6 Materials

There is no required textbook or reading packet for this course. Course readings will be made available through the course website or in class. However, I have identified a number of readings in course reading list from the Kolstad textbook listed below that you may find useful as a supplement to the readings from journal articles. I have listed some other books that are useful references below as well. They are either available at the library or available from me. You may, however, wish to purchase your own copies.

- Kolstad: Charles Kolstad, *Environmental Economics*, 2nd edition, Oxford University Press, New York, 2010.
- Angrist, Joshua D., and Joern-Steffen Pischke. *Mostly harmless econometrics: An empiricist's companion.* Princeton University Press,

  1.
- Varian: Hal R. Varian (1999) Intermediate Microeconomics, W.W. Norton & Company, Inc.: New York.

7 Outline & readings

Readings with a "*" are the focus of student reports and class presentations. This list is preliminary. I reserve the right to modify the readings and topics if I feel it is in the best interest of the class.

7.1 Introduction to environmental economics (1/9)

Readings:

- Heal, Geoffrey, "A Celebration of Environmental and Resource Economics," Review of Environmental Economoics and Policy, 1:7-25b (2007).
- Stavins, Robert N., 2008. "Environmental Economics." The New Palgrave Dictionary of Economics, 2nd Edition, eds. Lawrence Blume and Steven Durlauf. London: Palgrave Macmillan Ltd.

7.2 Microeconomics review (1/14-1/23)

Readings:

- If you want to consult a textbook to refresh your memory on this review material, look at Varian, Ch. 4-6, 14-16, 29, 31 and 32.

Materials:

MLK Day Break - 1/21

7.3 Review of empirical methods (1/28-1/30)

Readings:

- *Greenstone, Michael and Ted Gayer. "Quasi-experimental and experimental approaches to environmental economics," Journal of Environmental Economics and Management, 57(1):21-44, 2009.
- Nevo, Aviv, and Michael D. Whinston. "Taking the dogma out of econometrics: Structural modeling and credible inference." Journal of Economic Perspectives (2010): 69-81.

Materials:

7.4 Social choice, efficiency and markets (2/4-2/13)

Readings:

- Ando, A., J. Camm, S. Polasky, and A. Solow, "Species Distributions, Land Values, and Efficient Conservation," Science, 279, 1998.
- *Baylis, Patrick and Judson Boomhower, 2018, "Moral Hazard, Wildfires, and the Economic Incidence of Natural Disasters", NBER working paper.
- Kolstad, Ch. 3, 4

Materials:

President's Day Break - 2/18

7.5 Externalities & public goods/bads (2/20-2/25)

Readings:

- Kolstad, Ch. 5.
- Coase, Ronald H. 1960. "The Problem of Social Cost." Journal of Law and Economics 3:1-44.
- *Fell et al, 2018, "Emissions, Transmission, and the Environmental Value of Wind Energy", NBER working paper.

Materials:

7.6 Environmental regulation (2/27-3/11]

Readings:

- Standards, taxes & cap-and trade
  - Larry Goulder and Ian Parry, "Instrument Choice in Environmental Policy," Review of Environmental Economoics and Policy, vol 2 (2008).
  - *Walker, W. Reed. "Environmental regulation and labor reallocation: Evidence from the Clean Air Act." The American Economic Review 101, no. 3 (2011): 442-447.
  - *Lade, Gabriel E. and Ivan Rudik, 2018, "Costs of Inefficient Regulation: Evidence from the Bakken", NBER working paper.
  - Newell, R.G., W.A. Pizer, and J.-S. Shih. 2004. "Estimating the Gains to Emission Trading." Washington, DC: Resources for the Future.
  - Kolstad, Ch. 11-13
- Energy efficiency
  - *Fowlie, Meredith, Michael Greenstone, and Catherine Wolfram. "Do energy efficiency investments deliver? Evidence from the weatherization assistance program." No. w21331. National Bureau of Economic Research, 2015.

Materials:

No class: 3/13

7.7 Climate change (3/18-4/3)

Readings:

- Climate policy, discounting, and decision making
  - Goulder, Lawrence H., and Roberton C. Williams III. "The choice of discount rate for climate change policy evaluation." Climate Change Economics 3, no. 04 (2012): 1250024.

  - Nordhaus, William, 2007. "A Review of the Stern Review on the Economics of Climate Change," Journal of Economic Literature XLV.
  - Weitzman, Martin, 2007. "A Review of the Stern Review on the Economics of Climate Change," Journal of Economic Literature XLV.

- Carbon leakage and unilateral mitigation efforts

  - Goulder, Lawrence, 2007. "California's Bold New Climate Policy." Economists' Voice 4(3).
  - Nordhaus, William. "Climate clubs: overcoming free-riding in international climate policy." The American Economic Review 105, no. 4 (2015): 1339-1370.
  - *Colmer et al, 2018, "Emissions Trading, Firm Behavior, and the Environment: Evidence from French Manufacturing Firms", NBER working paper.
  - Aldy, Joseph and William A. Pizer, 2015, "Competitiveness Impacts of Climate Change Mitigation Policies.", Journal of the Association of Environmental and Resource Economists, 2(4): 565.

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- Estimating the impacts of climate change on agriculture

  - Mendelsohn, Robert, William D. Nordhaus and Daigee Shaw. 1994. "The Impact of Global Warming on Agriculture: A Ricardian Analysis" American Economic Review, 84(4):753-771
  - *Schlenker, Wolfram and Michael J. Roberts. 2009. "Nonlinear Temperature Effects Indicate Severe Damages to U.S. Crop Yields under Climate Change." Proceedings of the National Academy of Sciences, 106(37):15594-15598.
  - Deschenes, Olivier, and Michael Greenstone, 2007. "The Economic Impacts of Climate Change: Evidence from Agricultural Output and Random Fluctuations in Weather." American Economic Review 97(1).
  - Fisher, Anthony C., W. Michael Hanemann, Michael J. Roberts and Wolfram Schlenker. "The Economic Impacts of Climate Change: Evidence from Agricultural Output and Random Fluctuations in Weather: Comment" American Economic Review.

Materials:

Final project proposal due: 3/20
Spring break: 3/23-3/31

7.8 Non-market valuation (4/8-4/15)

Readings:

- Kolstad, Ch. 8
- *Muehlenbachs, Lucija, Elisheba Spiller, and Christopher Timmins. "The housing market impacts of shale gas development." The American Economic Review 105, no. 12 (2015): 3633-3659.

7.9 Final project presentations (4/17-5/1)

Final project due: 5/8

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8 Other useful resources

- NBER Summer Institute webpage where you may find archived conference programs and links to presented papers. In addition to the articles on the course reading list, this is an excellent a source of ideas for your final project.
- Resources for the Future (RFF) is the premier environment policy think tank in Washington DC analyzing current policy issues through an economics lens. Also, a great source of ideas for the final project.

9 University policies

9.1 Policy on disability support

The Colorado School of Mines is committed to ensuring the full participation of all students in its programs, including students with disabilities. If you are registered with Disability Support Services (DSS) and I have received your letter of accommodations, please contact me at your

earliest convenience so we can discuss your needs in this course. For questions or other inquiries regarding disabilities, I encourage you to visit `http://disabilities.mines.edu` for more information.

9.2 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.

9.3 Discrimination, harassment and Title IX

All learning opportunities at Mines, including this course, require a safe environment for everyone to be productive and able to share and learn without fear of discrimination or harassment. Mines' core values of respect, diversity, compassion, and collaboration will be honored in this course (More information can be found here) and the standards in this class are the same as those

expected in any professional work environment. Discrimination or harassment of any type will not be tolerated. As a participant in this course, we expect you to respect your instructor and your classmates. As your instructor, it is my responsibility to foster a learning environment that supports diversity of thoughts, perspectives and experiences, and honors your identities. To help accomplish this:

Course rosters are provided to the instructor with the student's legal name. I will honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. If something is said or done in this course (by anyone, including myself) that made you or others feel uncomfortable, or if your performance in the course is being impacted by your experiences outside of the course, please report it to:

- Me (if you are comfortable doing so)
- Wellness Center Counseling (`https://www.mines.edu/counseling-center/`)
- Speak Up (`https://www.mines.edu/speak-up/`) - Anonymous Option

In this course, we will cultivate a community that supports survivors, prevents interpersonal violence, and promotes a harassment free environment. Title IX and Colorado State law protects individuals from discrimination based on sex and gender in educational programs or activities. Mines takes this obligation seriously and is committed to providing a campus community free from gender and sex-based discrimination. Discrimination, including sexual harassment, sexual violence, stalking, and domestic violence, is prohibited and will not be tolerated within the Mines campus community. If these issues have affected you or someone you know, you can access the appropriate resources here: `http://www.mines.edu/title-ix/`. You can also contact the Mines Title IX Coordinator, Karin Ranta-Curran, at 303-384-2558 or krcurran@mines.edu for more information.

It's on us, all of the Mines community, to engineer a culture of respect.