

EC 371 – Environmental Economics

Fall 2011: Mondays, Wednesdays and Fridays, 11:00am-12:00pm, CAS 222

Instructor: Jeremy Smith

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Office Hours: Mondays, 4:30-6:00pm; and Tuesdays, 9:00-10:30am

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Description and Objective: This is a one-semester undergraduate course in environmental economics. My objective is to familiarize you with the basic tools used by economists to analyze relationships between economic behavior and environmental outcomes, as well as to demonstrate how economic reasoning can inform the environmental policy-making process. This is first and foremost an economics class: the focus will be on learning how to use simple tools and economic thinking to address general environmental issues, rather than on discussing specific environmental issues in a piecemeal fashion. The goal is to develop a rich toolbox that will allow you to think critically about a wide variety of current and relevant environmental problems and their proposed solutions.

Prerequisites: You are required to have taken EC 201 or EC 211 (formerly EC 301) in a previous semester. This is a serious requirement: the course will make extensive use of the basic skills and concepts developed in the microeconomics curriculum, and has been designed under the assumption that all students have a firm understanding of microeconomic analysis at the intermediate level. Examples and exercises may occasionally make use of simple differentiation, but reminders and hints will be provided for students who are not familiar with calculus. Some topics may include brief discussions of related regression analysis, but no previous statistics or econometrics training is required to understand this material.

Textbook: There are no required or recommended textbooks for this class. However, a potentially useful textbook is *Environmental and Natural Resource Economics, 7th Edition* (2006) by Tom Tietenberg. A copy will be made available on two-hour reserve at Mugar Library. The Tietenberg textbook is comprehensive, but is better at providing intuition and discussion than practice with mathematical examples. We will not be covering all of the material in this book, and lectures will frequently diverge from the book in terms of order and depth of coverage. Nonetheless, this is a standard reference, and can be useful for improving your understanding of the material and introducing you to topics that we will not have time to cover in class. There are also newer 8th and 9th editions of this book, with co-author Lynne Lewis: they include discussions of more recent events, but no changes related to the core material that we will cover in class. Some students may benefit from consulting the library copy of the 7th edition occasionally. On the other hand, I anticipate that very few students would find it worthwhile to purchase a copy of the book, in either a newer or older edition.

Grading: There will be two in-class mid-term exams during the semester worth 23% of the final grade each. There will be a final exam covering material from the whole semester during the exam period worth the remaining 54% of the final grade.

Attendance: I will not take attendance in class, but I will know if you are not present. I am required to report frequent absences to the College of Arts and Sciences. More to the point, though, there is a very strong historical correlation between regular attendance and doing well in this class. I very highly recommend that you come to all classes, arrive on time and be prepared to concentrate and take detailed notes. If you miss a class for any reason, it is your responsibility to obtain lecture notes from fellow classmates.

Communication: I will occasionally send e-mail to the class to make general announcements or alert you that I have posted something on the website. In order to receive these messages, you should make sure that you are officially registered for the course, that the university has your e-mail address recorded correctly and that you check your BU e-mail address regularly. I will generally respond briefly to e-mail questions within 24 hours, but will refer you to office hours if a lengthy response is necessary. I will generally not be available by phone outside of office hours, so sending me an e-mail is the best way to get in touch with me. However, you should not assume that I will be able to respond to your questions immediately. It is not acceptable to attempt to contact me through any phone numbers or e-mail addresses besides the ones provided in this syllabus.

Missed Exams: If the final or either of the mid-term exams is missed without prior official notification of a medical, religious or other valid, university-sanctioned reason, the student will receive a grade of zero on the missed exam. Students unable to write the final exam at the scheduled time for a valid reason will be allowed to write an equivalent exam at an agreed-upon alternative time. Students unable to write either of the mid-term exams at the scheduled time for a valid reason will have the weight shifted to the final exam in the grading scheme. Travel arrangements and busy schedules do not constitute valid reasons.

Academic Conduct: You are responsible for familiarizing yourself with the Boston University Academic Conduct Code, available at <http://www.bu.edu/academics/academic-conduct-code/>, and abiding by its principles. Please show respect for your institution, your fellow students and yourself by doing so and behaving honestly and honorably in this and all classes. Any infractions will be dealt with in strict accordance with the Code. Note that graphing and other programmable calculators are not allowed to be used during the exams, and neither is it allowed to share calculators during the exams. Using any electronic device other than a non-programmable scientific calculator or sharing calculators during an exam will be deemed a violation of the Academic Conduct Code under Section III.A., and will be dealt with in the same manner as any other violation.

Practice Problems: A set of practice problems will be handed out near the end of each major unit (four in total), and solutions will be provided about a week later. The problems will mostly be mathematical exercises that are extensions from the simple examples we will do in class. Working through these practice problems is crucial for understanding the concepts involved, and also for thinking about how the simple models we will be concentrating on can and should be enriched to account for realistic human behavior. This is also crucial for being able to apply reasoning developed in class to recent environmental developments and policy responses. Though they will not be graded, it cannot be stressed enough that struggling through these

problems before looking at the solutions and comparing your work with the solutions afterwards is necessary to succeed in the class.

Exams: The mid-term and final exams will be made up of multiple-part problems similar in style to the practice problems. The mid-terms will cover only selected topics, and will be mostly comprised of math-based questions. The final will cover all topics and material from the entire semester, with a more balanced mix of mathematical and written answer formats. Additional practice questions from past exams, with solutions, will be made available in advance of the exam dates. For all exams, no graphing or other programmable calculators and no sharing of calculators will be permitted; no communication with anyone besides me through any means will be permitted; and no consultation with any material besides that provided by me will be permitted.

Course Outline

The actual time spent on each topic will be decided as the semester proceeds, but the exam dates will not change. Reading suggestions refer to the Tietenberg book, 7th edition, and are optional. Some parts of the chapters referred to may not be relevant for the material covered in class. There will also be additional optional readings announced in class and posted on the website.

Introduction: How do Economists See the Environment?

(Chapter 1)

Unit 1, Part 1: Markets, Efficiency and Market Failure

- Theoretical foundations of consumer demand
- Market equilibrium and Pareto efficiency
- Externalities, public goods and free riding

(Chapters 2 and 4)

Unit 1, Part 2: Solutions to Market Failures

- Pigouvian taxes
- Property rights and the Coase Theorem
- Direct legislation and the possibility of government failure

(Chapter 4)

Unit 2: Introduction to Cost-Benefit Analysis

- Net present value and dealing with uncertainty
- Choice of discount rate
- Contingent valuation, travel costs, hedonics and other valuation methods

(Chapters 2 and 3)

First Mid-term Exam: Wednesday, October 19, 2011 (in class)

Unit 3: Air Pollution and Policy Responses

- Abatement costs
- Command and control, fees, tradable permits and cost-effective abatement
- The importance of technological adoption and advance
- Case study: sulfur dioxide emissions

(Chapters 15-17)

Unit 4: Introduction to Resource Economics

- Efficient extraction of non-renewable resources
- The biology and economics of a fishery: efficient harvesting of a renewable resource

(Chapters 5, 7 and 13)

Second Mid-term Exam: Wednesday, November 30, 2011 (in class)

Applications: Climate Change and Sustainable Development

- Climate change: mechanism; projected consequences; policy options
- Interpreting sustainability and gauging the limits to growth

(Chapters 5, 14, 17, 18, 22 and 23)

Final Exam: Tuesday, December 20, 2011, 9:00-11:00am, in classroom*

*** This is taken from the standardized final exam matrix, and is subject to change. You are responsible for checking your own final exam schedule.**