

Environmental Policy & Natural Resource Management
Economics 386-01 (Cross-listed as Econ 518 and Envi 386) Spring 2013

Instructor: Professor Sarah Jacobson

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Office Hours: Tue 2-4pm & Thu 9-11am, or by appointment

Class Meets: Mon & Weds 11am-12:15pm in Griffin 5 (this is a MWF class; we'll meet Mon & Weds but some students will attend 1-2 Fri meetings the last weeks of class; see schedule)

Teaching Assistant: Andrew Desrosiers (Andrew.S.Desrosiers@williams.edu)

TA Work Sessions: Thu 7:30pm in Schapiro 141 weeks when problem sets are due

Course Description:

Policymakers in developed and developing countries struggle to manage natural resources and to protect the environment from excessive degradation while attending to pressing human needs. Economics has a rich body of advice to help achieve these goals. In this course, we will study environmental policy and natural resource management from a microeconomic (and, to a lesser extent, macroeconomic) perspective. We will explore relevant economic theory, look for empirical evidence in scholarly studies, and study actual policies as they have been implemented. The course is undergirded by concepts like sustainability, welfare within and across generations, market failure, and valuation of environmental assets. We will continually emphasize issues of efficiency and equity. Again and again we will see that the challenges are both technical and ethical, as society is forced to make troubling tradeoffs. Topics in the class will include pollution (with a focus on climate change and on incentive-based policies like tax and "cap-and-trade"), management of nonrenewable and renewable resources (including resources like oil, forests, and fisheries), and energy (with its obvious links to resource use and climate change). We will also examine the relationship between development and the environment, touching on controversial topics such as the "natural resources curse" and the relationship between economic growth and the demand for environmental quality.

Prerequisites:

Economics 251 (intermediate microeconomics). Familiarity with statistics.

Course Objectives:

Environmental economics and resource economics are fields of applied (mostly micro-) economics that are naturally oriented toward policy. Both fields have developed over recent decades and are already fairly mature, with substantial bodies of knowledge from theory and empirics. In this class, you will learn the approaches, methods, and tools that characterize these fields. You will study some of the main topics represented in these fields in theory and in practice. You will learn about economists' policy advice in areas related to the environment and how that advice comes about. We will focus a great deal on market failures that can reduce efficiency, and how to identify cases with and without market failures. We will also be concerned with criteria other than efficiency, including equity and ethics. By the conclusion of the semester, you should be able to understand and evaluate (from an economic perspective) policy debates on wide-ranging topics regarding resources and the environment.

About the Syllabus:

This syllabus is a contract between the instructor and the class. If I would like to change any major elements, I will get class approval before doing so. Similarly, you must pay close attention to the requirements and deadlines in this document. If you have unavoidable conflicts with exams, etc., contact me within the first two weeks of class. So check your schedules NOW! On a related note, if you require any special accommodations (e.g. for exams), it is your responsibility to tell me about them right away so I can plan accordingly.

Textbook / Materials:

- Kolstad, Charles D., 2011, *Environmental economics*, 2nd ed. Oxford University Press, New York, NY. (The first and international editions are probably poor substitutes.)
- Collier, Paul, 2010, *The Plundered Planet*. Oxford University Press, New York, NY.

Additional readings are in the course reading packet. Most of them are quite short, and it is important that you read them. See the last page of the syllabus and the listing at the beginning of the course packet to see what to read for which lectures.

I will send out discussion questions for the readings, including the textbook, in advance. These will help guide your reading of the material and prepare you for topics we'll discuss in class.

Course Information on the Web:

Glow will be the main conduit for course information. I will also use email (both through Glow and the normal system) to send important messages, so monitor Glow and your email regularly.

Grading:

Exams (2)	20% each =	40%
Problem Sets (best 4 of 5)	3.5 % each =	14%
Paper		25%
Presentation		7.5%
Response to someone else's presentation		1.5%
Participation		12%
Extra Credit		up to 2%

Grades may be curved at the end of the semester if the distribution calls for it. That is, I will line up all numerical grades at the end of the semester and use the distribution to determine the appropriate cutoffs for each letter grade. Typically, the cutoffs do not diverge much from the traditional grade mapping. If I do curve, it will be a curve "upward."

I generally do not accept late assignments.¹

Exams:

We will have two exams, each worth 20% of your grade. The final exam will not be cumulative (except through the material's natural tendency to build on itself) and thus will be like a second

¹ In some cases I may accept an assignment that is slightly (1-2 days) late with a grade reduction. This is not allowed by default: you must have a good reason, you must ask me explicitly, and I may refuse. In any case the reduction rate is fairly steep so you generally don't want to do this.

midterm, although we will use the exam period scheduled by the registrar. I will schedule a review session outside of class before each exam.

Cell phone and graphing calculators cannot be used on exams. The exams are closed-book and closed-note, but I will allow you to bring a single notes sheet to each exam.

I do not provide make-up exams except in very exceptional cases. If an emergency will prevent you from taking an exam, you must contact me as soon as possible.

Problem Sets:

The purpose of problem sets is to improve and demonstrate your understanding of the material through problems and exercises. We will have 5 problem sets, of which I will drop your lowest grade; your best 4 problem sets make up 14 points in total on your final grade. Since the point of the problem sets is to develop your learning, you should still complete all five problem sets. The problem sets are all due on Fridays at 4pm to my office.

The TA, Andrew Desrosiers, will hold work sessions in which he'll help you work through the problem sets before they're due. Obviously, you should have worked through the problem set yourself before the session. I am also happy to help you with the problem set after you've spent some time on it.

Problem sets are graded on a Check+/Check/Check- basis. A Check+ is roughly an A; a Check is roughly a B/B+; and a Check- is roughly a C+/B-. An incomplete or very poorly-done problem set may receive a Check--, i.e. a Check-minus-minus (and this grade is bad).

Paper and presentation:

To tune the class to your interests, to give you some additional depth in a specific issue, and to give you practice applying the tools of the class, you will write a paper of moderate length (10-15 pages) on a topic of your choice. We will have a few intermediate deadlines—these will keep your work on the paper spread out through the semester and will help you improve the quality of your work. You will also present your work to the class in the last two weeks of the semester. The paper is worth 25% of your course grade, including points for intermediate deadlines. The presentation is worth 7.5% of your course grade. Additionally, 1.5% of your course grade will come from your written response to another student's paper presentation.

I have posted a detailed assignment sheet outlining my expectations for the paper and presentation and suggesting topics and approaches. You need not pick a topic from my list.

Attendance and Participation:

I expect you to attend lecture, participate in discussions, ask questions, and generally be engaged in the classroom. I also expect you to have read the assigned readings (textbook and packet) BEFORE class, and I want you to connect the course material with the real world around you and bring elements from the real world as you see it to your classmates. Finally, I want you to be attentive and engaged when your peers present their work on the last days of class.

Part of engagement with this class is participation in class discussions. Your participation will inevitably occur in a way that demonstrates that you read and considered the material before class. Class discussions may include cold-calling if that proves necessary to keep you on your toes and to encourage pre-class preparation.

Another participation element is a Glow forum on news and current events. You are not required to post to this forum. However, I'll be posting there, and if you're feeling interested or inspired by a post or by something you encounter outside of class, posting here is a great way to engage.

Twelve (12) points of your grade come from participation. If you make it clear that you're engaging with the material, attend regularly, and participate significantly and intelligently in class discussions, you will get full participation credit. If you participate little in class, do not seem engaged with the material, and/or do not give evidence of having done the readings before class, you will get partial participation credit.

Extra Credit:

I offer a few opportunities to earn up to 2 points of extra credit on your grade. Extra credit assignments are truly optional. Extra credit allows you to gain a few points on your grade and gives me a way to incentivize you to do small additional activities, usually revolving around different perspectives on or applications of the course material. Each opportunity's specifications and criteria are described on Glow.

Some advice: as in most classes, extra credit opportunities are designed to be fairly low payoff per effort. So if you are struggling in the class, you would get a more effective boost to your performance if you spend the time studying rather than working on extra credit assignments. These assignments should basically be done if you think it would be fun or interesting.

Honor Code:

The Honor Code applies to all assignments and assessments in this class. Please see the statement on "Academic Honesty and Honor Code" in the Student Handbook. It is important for you to understand what is and is not allowed in this course:

- Problem sets: you may consult other students and the TA, but all work you turn in must be your own. Write which students you worked with on the top of the first page of your problem set. Copying another student's work is cheating.
- Exams: exams are (generally) closed-note and closed-book, though a notes sheet may be allowed. Cheating is well-defined here, so do not cheat. Also, since some students may not take the exam at the same time/place as others, you must not discuss the exam with other students who may not have taken it yet. You may use calculators, but you must show all steps of your work.
- All written assignments, including forum posts and extra credit: you may consult others, but all work you turn in must be your own. Be particularly careful to avoid plagiarism. Plagiarism includes but is not limited to: using text directly or with small changes without quoting the source, even if you cite it; and using ideas without citing their sources. If you are unsure about proper attribution, contact me or campus writing resources. Even on an extra credit assignment, plagiarism is a serious Honor Code violation.
- On all: always feel free to consult me

If you have any questions about how the Honor Code applies to any aspect of this class, please talk to me about it.

Classroom Etiquette:

I have a great respect for Williams students and I expect you to show respect for each other. To act with respect in a classroom setting: show up on time, remain awake and visibly alert, don't use cell phones or other mobile devices, don't use a laptop unless you've cleared it with me in advance, don't hold "side conversations," and don't exit and re-enter the room excessively.

To reiterate and refine one particular point: mobile devices and laptops may seem innocuous to you, but they are subtly disruptive in the classroom. If you need to use a laptop to take notes, you must clear it with me in advance. Only use your mobile device if you urgently need to. If you use a laptop or a mobile device in class, I may not call attention to it at the moment, but I will notice.

Tentative Course Schedule / Outline (*deviations will be announced as necessary!*):

Date	TOPIC	Reading	Assgt.
Fri 2/1	Introduction, background	K1, K2, C1, Fullerton & Stavins	
Mon 2/4	Cost-benefit and cost-effectiveness analysis	K6, Arrow et al., Malla et al.	
Wed 2/6	Cont'd		
Mon 2/11	Criteria for evaluation	K3	
Wed 2/13	How markets work & fail	K4 (skip II), K5, K13.I, Hardin, Li	PS1 (Fri 2/15)
Mon 2/18	Cont'd		
Wed 2/20	Nonmarket valuation	K7, Field & Field, Soh, Brouwer et al.	
Mon 2/25	Cont'd		
Wed 2/27	Pollution	K11, K12, K13, Bluffstone	PS2 (Fri 3/1)
Mon 3/4	MIDTERM		
Wed 3/6	Cont'd		Paper topic Fri 3/8
Mon 3/11	Cont'd		
Wed 3/13	"Imperfect" pollution solutions	Blackman	
Mon 3/18	<i>No Class – Spring Break</i>		
Wed 3/20	<i>No Class – Spring Break</i>		
Mon 3/25	<i>No Class – Spring Break</i>		
Wed 3/27	<i>No Class – Spring Break</i>		
Mon 4/1	Climate change	Aldy et al., Aldy & Stavins	
Wed 4/3	Cont'd		PS3 (Fri 4/5)
Mon 4/8	Sustainability and growth	C2, Heal, Daly / Dasgupta	
Wed 4/10	Nonrenewable resources	C4, C5, C6	Paper outline + refs Fri 4/12
Mon 4/15	Cont'd		
Wed 4/17	Energy	Wolfram et al., Heal, Jacobson	PS4 (Fri 4/19)
Mon 4/22	Cont'd		
Wed 4/24	Renewable resources	C8, Ostrom, Nash, Reichhuber & Requate, Morris & Stevenson	
Mon 4/29	Cont'd		
Wed 5/1	Trade and the environment	K20, Frankel	
Fri 5/3	Presentations	(You'll attend at least 2 of these 4 presentation sessions)	PS5 (Fri 5/3)
Mon 5/6	Presentations		
Wed 5/8	Presentations		
Fri 5/10	Presentations		
	FINAL EXAM (date set by Registrar)		Paper Mon 5/13

Readings: K#: Kolstad chapter. C#: Collier chapter. Other names: packet articles.

List of Readings:

* *Optional readings are marked with a star and are italicized; they are not in the packet but are available on Glow. If you'd like me to print out any of the optional readings for you, just ask!*

Introduction & background:

- Fullerton, Don and Stavins, Robert, 1998. "How economists see the environment." *Nature*, 395(6701), 433-434.

Cost-benefit and cost-effectiveness analysis:

- Arrow, Kenneth J., Cropper, Maureen L., Eads, George C., Hahn, Robert W., Lave, Lester B. et al., 1996. "Is There a Role for Benefit-Cost Analysis in Environmental, Health, and Safety Regulation?" *Science*, 272(5259), 221-222.
- Malla, Min Bikram, Bruce, Nigel, Bates, Elizabeth and Rehfuess, Eva, 2011. "Applying Global Cost-Benefit Analysis Methods to Indoor Air Pollution Mitigation Interventions in Nepal, Kenya and Sudan: Insights and Challenges." *Energy Policy*, 39(12), 7518-7529.

Criteria for evaluation:

- * *(Optional) Perlman, Ma, McGilvray, and Common, 2003. Natural Resource and Environmental Economics 3rd edition. Selection from Chapter 3.*

How markets work & fail:

- Hardin, Garrett. 1968. The tragedy of the commons. *Science* 162, no. 3859: 1243-1248.
- Li, Rita Yi Man, 2012. "The Internalisation of Environmental Externalities Affecting Dwellings: A Review of Court Cases in Hong Kong." *Economic Affairs (Institute of Economic Affairs)*, 32(2), 81-87.

Nonmarket valuation:

- Field, Barry C. and Field, Martha K., 2009, *Environmental Economics: An Introduction (5th edition)*. McGraw-Hill/Irwin, New York, NY. Chapter 7.
- Soh, Christabelle N.E., 2012, Benefit Transfers. In: Euston Quah and Raymond Toh (Eds.), *Cost-Benefit Analysis: Cases and Materials*. Routledge Taylor & Francis Group, London and New York.
- Brouwer, Roy, Haider, Wolfgang, Gunaratne, Lokugam and Beardmore, Ben, 2010, A Choice Experiment of Human-Elephant Conflict Resolution in Sri Lanka. In: Jeff Bennett and Ekin Birol (Eds.), *Choice Experiments in Developing Countries: Implementation, Challenges and Policy Implications*. Northampton, Mass. and Cheltenham, U.K.: Elgar, pp. 17-32.

Pollution:

- Bluffstone, Randall A., 2003. "Environmental taxes in developing and transition economies." *Public Finance and Management*, 3(1), 143+.

"Imperfect" pollution solutions:

- Blackman, Allen, 2010. "Alternative Pollution Control Policies in Developing Countries." *Review of Environmental Economics and Policy*, 4(2), 234-253.

Climate change:

- Aldy, Joseph E., Krupnick, Alan J., Newell, Richard G., Parry, Ian W. H. and Pizer, William A., 2010. "Designing Climate Mitigation Policy." *Journal of Economic Literature*, 48(4), 903-934.
- Aldy, Joseph E. and Robert N. Stavins. "Climate Negotiations Open a Window: Key Implications of the Durban Platform for Enhanced Action," Cambridge, Mass.: Harvard Project on Climate Agreements, September 2012.
- * (Optional) Heal, Geoffrey, 2009. "Climate economics: A meta-review and some suggestions for future research." *Review of Environmental Economics and Policy*, 3(1), 4.
- * (Optional) Newell, Richard G., Pizer, William A. and Raimi, Daniel, 2012, "Carbon Markets: Past, Present, and Future." *Resources For the Future, Discussion Papers*.

Sustainability and growth:

- Heal, Geoffrey, 2012. "Reflections—Defining and Measuring Sustainability." *Review of Environmental Economics and Policy*, 6(1), 147-163.
- Daly, Herman, 2005, "Economics In A Full World." *Scientific American*, pp. 100-107. With response by Partha Dasgupta included.
- * (Optional) Malthus, Thomas. 1798. *The Principle of Population Chapter 1-2*

Nonrenewable resources:

- (none outside the text)

Energy:

- Wolfram, Catherine, Shelef, Ori and Gertler, Paul, 2012. "How Will Energy Demand Develop in the Developing World?" *Journal of Economic Perspectives*, 26(1), 119-138.
- Heal, Geoffrey, 2010. "Reflections—The Economics of Renewable Energy in the United States." *Review of Environmental Economics and Policy*, 4(1), 139-154.
- Jacobson, Sarah, 2013. "Energy Economics Notes"

Renewable resources:

- Ostrom, Elinor, 2008. "Institutions and the Environment." *Economic Affairs*, 28(3), 24-31.
- Nash, Betty Joyce, 1987. "The fish market: what happened when Virginia brought tradable quotas to the commons." *Region Focus*(3Q), 24-27.
- Reichhuber, Anke and Requate, Till, 2012. "Alternative use systems for the remaining Ethiopian cloud forest and the role of Arabica coffee — A cost-benefit analysis." *Ecological Economics*, 75(0), 102-113.
- Morris, Daniel F. and Stevenson, Andrew 2011. "REDD+ and International Climate Finance: A Brief Primer." *Resources for the Future*
- * (Optional) *The Economist*. "Seeing the wood: A special report on forests." Sept 25 2010.
- * (Optional) *The Economist*. "Troubled waters: A special report on the sea." Jan 3 2009.
- * (Optional) Worm, Boris, et al. "Rebuilding Global Fisheries" *Science* 31 July 2009: 578-585.

Trade and the environment:

- Frankel, Jeffrey A., 2005, The Environment and Globalization. In: Michael M. Weinstein (Ed.), *Globalization: What's new?* A Council on Foreign Relations Book. New York: Columbia University Press, pp. 129-169.
- * (Optional) Marconi, Daniela, 2012. "Environmental Regulation and Revealed Comparative Advantages in Europe: Is China a Pollution Haven?" *Review of International Economics*, 20(3), 616-635.