Syllabus: Environmental Economics

**Time:** TuTh 2:55PM - 4:10PM

**Location:** Malott Hall 251

**Professor:** Shanjun Li  
405 Warren Hall  
aem4510@gmail.com (this is the designated course email address)  
Office Phone: 607-255-1832

**Office Hours:** Tu 4:20-5:00PM at 405 Warren Hall and by appointment

**TA:** Joel Landry aem4510@gmail.com, office hour and location: Friday 2-4, 434 Warren Hall.

**Course Summary**

This class will focus on the role of the environment in the theory and practice of economics. It will make use of microeconomic and statistical analysis at the intermediate level and will incorporate real-world examples. The class will be divided into two parts. Part I will cover the ways in which markets fail to efficiently allocate resources in the presence of pollution along with the class of Pigouvian policies used to correct those failures. Part II will focus on the empirical techniques used by economists to put values on environmental commodities. Knowing these values is a precondition for properly applying the policies described in Part I.

**Prerequisites**

You should have completed Calculus and intermediate microeconomics courses (MATH 1110 and ECON 3130) before taking this class. Ideally, you will also have completed or concurrently take at least one of the econometrics courses such as AEM 4110 (Introduction to Econometrics), ECON 3200 (Introduction to Econometrics), and ECON 3210 (Applied Econometrics).

**Requirements**

The following are required for successful completion of the course: (1) two theoretical problem sets covering theoretical concepts, (2) a short paper on hydraulic fracturing for shale gas extraction; (3) a short empirical project designed to illustrate the endogeneity of many environmental taxes (and to teach some basic empirical skills), (4) a group empirical project in which you will implement a non-market valuation technique (a theoretical project or literature review can be used in lieu of the empirical project if you desire to do so), and (5) class participation. We will have a number of in-class activities that are intended to keep things from getting boring. These sorts of activities generally work best if everyone comes prepared and participates. There will also be opportunity for participation in the course of normal lectures.
Grading

Grades will be determined based on the following allocation:

- Class participation (all in-class activities) 10%;
- two theoretical problem sets 20%;
- short paper (Fracking) 20%;
- short empirical project (endogenous taxation) 10%;
- group empirical/theoretical Project 40%. All of these assignments are distributed at the start of the semester so you can begin to work on them as soon as you want. All the assignments except the group project are individual assignments and you are expected to turn in your individual answers. Plagiarism will not be tolerated.

Group Project

You are expected to work on the group project in a group of 3-5 students. You need to form your group and inform my TA Joel at aem4510@gmail.com about the members of your group no later than March 29th, 2014. If you have trouble forming the group, email Joel before the deadline so that he can be an eHarmony for you.

For the group project, a list of topics and potential data sources are posted on the blackboard under the Group Project folder which itself is under the Administration folder. Alternatively, I encourage you to come up with your own topic and collect your own data. One way to do that is to read recent literature from major environmental economic or general economic journal (e.g., Journal of Environmental Economics and Management, Review of Environmental Economics and Policy, American Economic Review, Quarterly Journal of Economics) that discusses a very specific environmental issue with economic consequences.

The final products will be a 15-20 minutes class presentation (divided equally among the members) and a paper between 8-15 pages not including references but everything else (font 12 and double spacing). The group presentations will be held during the last 3 lectures or so. The grade for the group project will be based on both the presentation and the paper itself.

The group paper should have the following five sections:

1. Summary: a maximum of 1 page summary of your paper (be sure to include names of all authors)
2. Introduction. Please include the following subsections: (1) What is the issue (define the problem), and (2) why is this issue important? One way to establish your argument in the second subsection is to include quotes from major newspapers or magazines, such as the New York Times or the Wall Street Journal or the Economists, or some quote by some major public figure (politician etc.) that discusses the problem.
3. Economic analysis and findings. For an empirical project, this section should include data and empirical model. For a theoretical paper, it should include a theoretical model or theoretical arguments and derivations. Findings should be presented here.
4. Conclusion. Discuss briefly what lessons we can learn from the study (e.g., policy suggestions).
5. References. List all the references used in your article.

The paper has to be submitted in electronic format to aem4510@gmail.com no later than 12PM on May 15th (late submission will not be accepted).
Readings

The required textbook for the class is


Other sources of optional readings are:


The second optional book is more expensive and is placed on reserve at Mann library. The third optional book is available as ebook on Cornell library website and many of the articles in the book should be available online somewhere in article format. All optional readings in the following list are italicized. Most of the reading materials (excluding those from the three books) will be posted on our course website.

Course Outline (Tentative, I reserve the right to modify the content)

Introduction (~1.5 lectures)

1. Keohane and Olmstead, Ch. 1
   - David Pearce: An intellectual history of environmental economics
   - Rich and Broder. “A Debate Arises on Job Creation and Environment”
   - *RFF Reader, An Economic Perspective on Environmental Policy and Resource Management: An introduction*

2. Market and Efficiency
   - Keohane and Olmstead, Ch. 4
   - *Kolstad, Ch. 3 and 4*

Part I – Market Failures and Pigouvian Policy

1. Externalities (~1.5 lectures)
   - Keohane and Olmstead, Ch. 2 (pp.11-27), Ch. 5 (pp.65-76)
   - *Kolstad Ch.5 (pp.78-83, 90-94)*
   - *RFF reader, Ch. 2 (pp. 7-12)*
(2) Pigouvian Policy (~4 lectures)
- Keohane and Olmstead, Ch. 8 (pp.129-140, 150-151), Ch. 9 (pp.153-161)
- Kolstad, Ch. 7 (pp.117-124, 129-131), Ch. 8

First Theoretical Project Reminder

(3) Coase Theorem (~1.5 lectures)
- Keohane and Olmstead, Ch. 8 (pp.125-129)
- Kolstad, Ch.6

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First Theoretical Project Due
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(4) International Agreements (~1.5 lectures)
- Kolstad, Ch.13 (pp.263-266)
- RFF reader, Ch 36 (pp.202-212)

(5) Uncertainty (~ 1 lecture)
- Keohane and Olmstead, pp.143-150
- NERC Podcast
- Kolstad, Ch. 10 (pp.183-189)

(6) Discounting (~ 0.5 lecture)
- Keohane and Olmstead, Ch. 2 (pp.27-30)
- RFF reader: Ch 5 & 6 (pp. 38-37)

(7) Heterogeneity and Tradable Permits (~ 2 lecture)
- Keohane and Olmstead, Ch.9 (pp.162-168, 173-181), Ch.10 (pp.182-190)
- Kolstad, Ch.9
- RFF Reader, Ch. 9 &10 (pp. 51-65)

In-Class Emissions Trading Exercise (prizes for winners)

Second Theoretical Project Reminder

(8) Free-Lunches: The Double Dividend and Porter Hypotheses
- Keohane and Olmstead, Ch.8 (pp.150-151)

- *Kolstad, Ch.14 (pp.281-284)*

Second Theoretical Project Due

A guest lecturer from a practitioner (from government agencies or industry) or a researcher will be given usually somewhere in the second half of the course.

Part II – Non-Market Valuation

(1) Review of Regression Analysis and Introduction to Stata
- Materials on blackboard
- http://www.youtube.com/watch?v=gb4qqX4uhYA
- Standard introductory textbooks on econometrics: 

Short Paper Assignment Due (Fracking)

Endogenous Taxation Reminder

(2) Cost-Benefit Analysis and Sources of Value
- Keohane and Olmstead, Ch.3
- *Kolstad, Ch.15*
- *RFF reader, Ch.3 (pp.15-20)*

Endogenous Taxation Assignment Due
(3) Hedonic Method
   - Kolstad, Ch.16 (pp.323-331)

(4) Travel Cost Method
   - Hanley, Shogren, and White, Ch.3 (pp.53-59)
   - Kolstad, Ch.17 (pp.344-350)
   - King and Marzotta, http://www.ecosystemvaluation.org/travel_costs.htm

(5) Contingent Valuation Method
   - Kolstad 18 (pp.355-364)
   - *RFF reader, Ch. 7 (pp. 38-42)*

**Student Presentations on Group Projects**

**Notes:**

(1) Matthew Kahn will be giving a seminar on April 22 from 4:15-5:45 in 401 Warren Hall (tentative so watch out for the announcement). He is an economics professor at UCLA and a leading expert on environmental, energy, and urban issues in the U.S. and China: https://sites.google.com/site/mek1966/

(2) Each semester, I invite a practitioner (from government agencies or industry) or a researcher to give a guest lecture (usually in the second half of the course) that is related to our course (pretty much any topic in environmental and energy economics). I have a few people in mind but also welcome your nomination (e.g., someone you know and it is not too costly to get)