**ENVIRON 962.01 ECONOMICS OF ENVIRONMENTAL MANAGEMENT**

**FALL 2014**

Meetings: Wednesday, 8-9:15 pm ET via Adobe Connect

Instructor:

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**Aims and Objectives of the Course**

This course provides an economic perspective to the management of environmental quality and natural resources from a policy point of view. The course addresses conceptual and methodological issues with some application to recent empirical work. The course is divided in two parts. The first one focuses on basic theory and methods of economic analysis of environmental problems. These will deal with interactions between the economy and the environment, the management of market failures and tools for valuing the environment. The second one focuses on the economics of the environment with particular emphasis on the economics of pollution control mechanisms, climate change and ecosystem services. This part will also deal with the political economy of environmental policy formulation.

On completion, students will be able to:

* Describe and discuss environmental economics and policy issues.
* Understand interactions between the economy and the environment.
* Appreciate the strengths and shortcomings of different economic methods, mechanisms and policies for managing environmental quality.

**Readings**

*Textbook*

Keohane, Nathaniel O. and Sheila M. Olmstead (K&O). 2007. Markets and the Environment. Island Press (hard copy to be provided).

Additional reading materials are assigned below. Students should regularly check (i.e at least three times a week) for announcements, assignments, quizzes, and on-line discussions posted on Sakai. All course slides will be posted on Sakai. Materials will become available as the course proceeds.

**Communications**

Each module will include a Sakai discussion board. Please email the instructor or teaching assistant for any questions you may have on readings, lectures, assignments and other course materials. We will do our best to reply within 24 hours. Class communications will occur through a weekly web based conference calls. We will use Adobe Connect (url: <http://nicholas.adobeconnect.com/env962/>). These web conference calls will be used to lecture-oriented, drawing from readings and instructor’s experiences, but interactive via Q and A.

**Assignments**

Each module but one will have a written assignment. This assignment will consist of short essays and problem sets. There will be at least 10 days to complete each assignment. Assignments will be posted and submitted through Sakai. If you have any problem in meeting the deadline please let the instructor know in advance to avoid late penalties. A penalty of 10% a day of final mark will be applied for late submissions without prior accordance with the instructor.

**Group Projects**

You will work on a team that will prepare an environmental policy briefing report to a pre-defined policy making audience (e.g., Member of Congress or Administration official) on a significant environmental issue (i.e climate change, renewable energy, deforestation, endangered species). Once the teams are set up, they should work on the assigned project. The final report will be given in class during our final meeting at the end of the semester. The report should be accompanied by an oral presentation in Power Point and by a one page abstract. The target audience for the report could include political appointees, junior and /or senior career staff at agencies, congressional staff, business decisionmakers and journalists. The report should include the following:

* A brief summary of the key scientific dimension of the issue
* A discussion on the economics dimension associated with the environmental issue including a summary of empirical evidence from main background literature
* An analysis on how economic incentives can be used to address the issue, including advantages and disadvantages relative to current policy approaches
* A set of policy guidelines to improve the environmental management of your assigned issue.

Groups should utilize quantitative methods taught in the class to perform their analysis.

**Nicholas School Honor Code**

All activities of Nicholas School students, including those in this course, are governed by the Duke Community Standard.

Duke Community Standard

Duke University is a community of scholars and learners, committed to the principles of honesty, trustworthiness, fairness, and respect for others. Students share with faculty and staff the responsibility for promoting a climate of integrity. As citizens of this community, students are expected to adhere to these fundamental values at all times, in both their academic and non-academic endeavors.

The Pledge

Students affirm their commitment to uphold the values of the Duke University community by signing a pledge that states:

1. I will not lie, cheat, or steal in my academic endeavors, nor will I accept the actions of those who do.

2. I will conduct myself responsibly and honorably in all my activities as a Duke student.

**Exam Policies**

There will be two exams covering the material in Part 1 and 2. The exams will be open book, open notes, and open course material. No other sources or individual may be consulted during the exam.

Exam will be given through Sakai and will be held during the following days:

First Exam: Sept 29-30 (TBD)

Second Exam: Week of November 19

**Course Participation**

It is essential that students are up-to date on course materials and participate in team meetings on a regular basis. Please note that participation in conference calls and discussion boards in extremely important. A portion of your participation grade will be derived from other team members’ evaluation of your contribution to the team project.

**Grading**

The final grade will be determined as follows:

Exam #1 15%

Exam #2 20%

Module written assignments 20%

Class participation 20%

Team project 25%

**Outline modules summary**

**Part I. Theory, Fundamentals, and Tools**

Module 1. Intro to the course. Economic and environmental system interactions

Module 2. Market efficiency, Market failures, Public goods, Externalities

Module 3. Tools for the environment: Basic valuation techniques and Cost Benefit Analysis

Module 4. Renewable and non-renewable natural resources

**Part II. Applications to Critical Environmental Problems**

Module 5. Economic instruments for pollution control

Module 6. Economics and policy of climate change

Module 7. Ecosystem Services

*Closing Lecture: Sustainable Development*

**Course Schedule and Readings**

| Date | Module | | Readings/Assignments |
| --- | --- | --- | --- |
| Part I: Theory and Fundamentals | | | |
| On-Campus  August 19  (Week 1) | **1. Introduction to the course. Economic and environmental system interactions.**  ***Will include an in-class experiment on common property resources*** | K&O Ch 1 Introduction  Don Fullerton and Stavins, R. “How Economists See the Environment”, in Stavins (2012), Part I, Chapter 1. E-reserve  Hardin, G., in Stavins (2005), ‘The Tragedy of the Commons’, pp. 9-22 e-reserve  Optional:“Visions of the Future.” Ch. 1 in Tietenberg and Lewis Environmental and Natural Resource Economics (2012) on e-reserve.  Complete group assignment questionnaire (on Sakai) by Tuesday Aug 26  Written assignment Module 1 due Friday August 29 | |
| August 25-  September 7  (Weeks 2 and 3) | **2.Supply, Demand, Market efficiency, Market failures (Public goods and Externalities)** | **Week 1:** K&O: Ch 4 Efficiency of Markets  Recommended youtube videos:   * Basic Supply, Demand, and Market Equilibrium (3:35) <https://www.youtube.com/watch?v=0yWsOZgsTSY> * Shifts in supply and demand curves (27:30; focus on first 14:00) <https://www.youtube.com/watch?v=es_g3L1kmR8> * Consumer and Producer Surplus (4 short videos about 5 min each) <https://www.khanacademy.org/economics-finance-domain/microeconomics/consumer-producer-surplus>   **Week 2:** K&O Ch 5 Market Failures in the Environmental Realm  Coase, R. in Stavins (2012), ‘The Problem of Social Cost”  See short video clip (8 min) on “Public vs Private Goods” at  <http://www.conservation-strategy.org/en/csf-econ-video-lessons>  Written Assignment, Module 2 Due: Sunday, September 7 | |
| September 8-21  (Weeks 4 and 5) | **3.Tools for the environment: Basic valuation techniques and Benefit-Cost Analysis** | **Week 1:** K&O: Ch 2 Economic Efficiency and Environmental Protection;  Goulder, L. H. and Stavins R.N., in Stavins (2012), ‘An Eye on the Future’, e-reserve  Supplemental material on metrics for use in benefit-cost analysis of public policies (on sakai site)  **Week 2:** K&O: Ch 3 Benefits and Costs of Environmental Protection  Haneman, W. M. in Stavins (2012), ‘Valuing the Environment through Contingent Valuation’, e-reserve  Good application: *H, Spencer Banzhaf, Dallas Burtraw, David Evans,and Alan Krupnick.* Valuation of Natural Resource “Improvementsin the Adirondacks *Land Economics •* August 2006 • 82 (3): 445-464 <http://www.jstor.org/stable/10.2307/27647722?origin=api>  Written Assignment, Module 3 Due: Sunday, September 21 | |
| Sept 22-Oct 5  (Weeks 6&7) | **4. Natural resources: Non-renewable and renewable**  **Exam I – Mon or Tues Sept 29-30 (to be determined) – On Modules 1-3** | **Week 1 Non-renewable resources and energy:** K&O: Ch 6 Managing Stocks: Natural Resources as Capital Assets;  Non-technical supporting material The Simon–Ehrlich wager. (*A famous wager/debate between an ecologist and an economist about future resource scarcity as measured in prices. This is one of the rare cases when I will refer to Wikipedia as an appropriate source*) <http://en.wikipedia.org/wiki/Simon%E2%80%93Ehrlich_wager>  Energy puzzle: U.S. has oil glut but higher gasoline prices by Eric Nalder / Hearst Newspapers  Apr 29, 2012  <http://newsminer.com/bookmark/18386153-Energy-puzzle-U-S-has-oil-glut-but-higher-gasoline-prices>  **Week 2: Renewable resources.** K&O: Ch.7 Stocks that Grow: The Economics of Renewable Resource Management.  No written assignment for this module, but initial project summary due Oct 5 (see Sakai for template) | |

| Date | Module | | Readings/Assignments |
| --- | --- | --- | --- |
| Part II. Applications to Critical Environmental Problems | | | |
| Oct 6 -Oct 19  (Weeks 8&9)  (Note: Fall Break is Friday, October 10th at 7 pm until Wednesday, October 15th at 8:30 am, so we’ll hold both classes as usual – we will not have class on Weds Nov 26 - T’giving) | **5.Economic Instruments for Pollution Control** | **Week 1:** K&O: Ch. 8 Principles of Market-based Environmental Policy  **Week 2:** Ch 9: The Case for Market Mechanisms in the Real World; Ch.10: Market-based Instruments in Practice.  Optional: Read the following short essays in *Issues of the Day: 100 Commentaries on Climate, Energy, the Environment, Transportation, and Public Health Policy*, I.W.H Parry and F. Day (eds.). RFF Press, Resources for the Future, Washington, DC. Accessible at <http://issuu.com/resources-for-the-future/docs/issues_of_the_day_complete>  Essay 13: B. Murray. “Emissions Offsets in a Greenhouse Gas Cap-and-Trade Policy.” (P. 30-31)  Essay 53: C. Costello and S. Gaines. “Can Catch Shares Save Fisheries?” (p. 112-13)  Essay 55: R. Deacon. Achieving Efficient Cooperation and Acceptance in Fishery Reform.” (p.116-17)  Written Assignment, Module 5: Managing Environmental Pollution Due: Sunday, October 19 - | |
| Oct 20-Nov 2  (Weeks 10 and 11) | **6.Economics and Policy of Climate Change** | **Week 1:** Tietenberg & Lewis: Ch 16 Climate Change on e-reserve Goulder, L.H. and W.A. Pizer. The Economics of Climate Change. [New Palgrave Dictionary of Economics, 2nd Edition, Macmillan Publishing, Ltd. Downloadable from SSRN working papers online.](file:///C:\Users\bcmurray\Documents\Teaching\DEL%20Envir%20Econ%20Course\Fall%202012\New%20Palgrave%20Dictionary%20of%20Economics,%202nd%20Edition,%20Macmillan%20Publishing,%20Ltd.%20Downloadable%20from%20SSRN%20working%20papers%20online%20http:\papers.ssrn.com\sol3\papers.cfm%3fabstract_id=869644)  <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=869644>  Stern, Nicholas. The Stern Review on the Economics of Climate Change, Executive Summary (long version).  <http://www.hm-treasury.gov.uk/d/Executive_Summary.pdf>  Optional: Alternative perspectives on the Stern Report (youtube)  William Nordhaus  <http://www.youtube.com/watch?v=ne5XtJkt4sI>  William Cline/Stern’s response to Nordhaus and Cline  <http://www.youtube.com/watch?v=egSwC3tB-hk&feature=relmfu>  **Week 2:** Newell, R.G., W.A. Pizer, and D. Raimi. 2014. “Carbon Markets: Past, Present and Future.” *Ann Rev Resource Econ.* <http://www.annualreviews.org/doi/abs/10.1146/annurev-resource-100913-012655>  Optional: Murray, B.C., P.T. Maniloff and E.M. Murray. 2014. “Why Have Greenhouse Emissions in RGGI States Declined? An Econometric Attribution to Economic, Energy Market, and Policy Factors.” Duke Environmental Economics Working Paper Series Working Paper EE 14-0. <http://sites.nicholasinstitute.duke.edu/environmentaleconomics/working-paper-series/>  Written Assignment, Module 6: Climate Change Policy  Due: Sunday, November 2 | |
| Nov 3-16 | **7.Ecosystem Services** | *Week 1: Placing a value on nature* Costanza, Robert, Ralph d’Arge, Rudolf de Groot *et al* 1997.  “The value of the world's ecosystem services and natural capital.”  *Nature* 387, 253-260 (15 May 1997).<http://search.proquest.com/docview/204460700> \*\*\* Note: the following 3 articles are from a special issue section in the journal, *Ecological Economics* devoted to responses to the Costanza article \*\*\*  Toman, Michael. “Why not to calculate the value of the world’s ecosystem services and natural capital.” *Ecological Economics* 25 (1998) 57–60.  <http://www.sciencedirect.com/science/article/pii/S0921800998000172>  R.K. Turner, W.N. Adger, R. Brouwer.  1998.  Ecosystem services value, research needs, and policy relevance: a commentary. *Ecological Economics* 25 (1998) 61–65  <http://www.sciencedirect.com/science/article/pii/S0921800998000184>  Costanza, Robert, Ralph d’Arge, Rudolf de Groot *et al* 1998. “The Value of Ecosystem Services : Putting Things in Perspective.” *Ecological Economics* 25 (1998) 67–72  <http://www.sciencedirect.com/science/article/pii/S0921800998000196>  ***Week 2: More concepts and application***  Relevant application:: Jenkins, W.A., B.C. Murray, R.A. Kramer, and S.P. Faulkner.  2010.  “Valuing Ecosystem Services from Wetlands Restoration in the Lower Mississippi Alluvial Valley.” *Ecological Economics* 69 (5): 1051–1061.  <http://www.sciencedirect.com/science/article/pii/S0921800909004716>  Linwood Pendleton, Brian C. Murray, David Gordon, David Cooley and Tibor Vegh. 2014“Harnessing the financial value of coastal ‘blue’ carbon” Ch 17 in Valuing Ecosystem Services K.N. Ninan, Ed) Edgar Elgar Press. [Will be on resources]  Preliminary report outline due Sunday Nov 9 (see Sakai for template)  Written assignment Module 7. Due Sunday Nov 16 | |
| Nov 19 (tentative) |  | **Second Exam** | |
| November 26-30 | **Thanksgiving break** | No class or assignments | |
| December 1-  December 6 | **Finalization of Paper and Preparation for Group Projects** |  | |
| December 7-9 (tentative) | **Presentation of Group Projects on campus**  **In person-discussion topic: Can Economics Contribute to a Sustainable Future?** | K&O: Ch 11 Sustainability and Economic Growth  Tietenberg and Lewis. The Quest for Sustainable Development (Ch 20) | |