

# Syllabus of Economics 436 [updated January 6<sup>th</sup>, 2010]

Environmental Economics

Winter 2010

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**Prerequisite:** ECON 300.

**Course goals and course description:** This course aims at equipping students with economic methods and tools to analyze basic environmental issues. This course combines theoretical analysis with discussions on specific environmental policies as applied to water, air pollution, energy, climate change and human health issues. Within these examples, particular topics that will be covered are the microeconomic analysis of environmental regulation, the problem of social cost, policy instrument choice, enforcement of regulations, and estimating benefits of environmental improvements.

## Class Sessions

There will be two meetings per week, each lasting one hour and fifty minutes, Mondays and Wednesdays from 8:30 to 10:20 in Raitt Hall, room number 121. Each class session will involve a lecture and a discussion section. In class, either at the very beginning or at the end of the class from time to time you will be writing so called “2 minute papers” as well as on an ad hoc basis in-class quizzes. Some additional lecture notes, problem sets, links to articles will be posted on the teaching website

<http://hendrikwolff.com/teaching.html>

Students are expected to do the suggested readings before the class. Since part of the exams, the 2-minute papers and the in class quizzes are often “open book”, it is suggested that you bring the respective reading material to class. Active participation in the class is strongly encouraged.

## Office Hours:

My weekly office hours are Tuesdays 4:00pm to 6:00pm, Savery Hall Room 349. If this time window systematically conflicts with your time schedule, please let me know in class, so that we can find a different time. Also, feel free to email me at [hgwolff@u.washington.edu](mailto:hgwolff@u.washington.edu) for any research or urgent course related questions. Please note, however, that emails with questions regarding course material *shortly* before problem set due dates or exams will NOT be answered.

### Short Student Paper

Students are required to write a short, **less** than 3 page paper, on a specific environmental issue of their choice. The basis, however, for the paper should come from a recent article in a major newspaper/magazine, such as the *New York Times* or the *Wall Street Journal* that discusses an environmental issue. The student paper should then shortly elaborate on the following four points

- (i) what is the issue
- (ii) why is it important
- (iii) how economic tools can be applied to analyze the issue, including references to the existing **academic** literature (i.e. in economic journals like i.e. *Journal of Environmental Economics and Management*, *American Economic Review*, *Quarterly Journal of Economics* etc.), that discusses this subject.
- (iv) what lessons can we learn from the economics analysis (i.e. what are the policy recommendations or what are the new insights for the business world etc.).

In class we will go over specific examples that exemplify this student paper project in more detail.

Please note: Handwritten papers will NOT be accepted, unless your handwriting looks as neatly as the printing from a typewriter. The main text should be double-spaced. Do not use a font smaller than 11 pt or larger than 12 pt.

The following deadlines apply to this short student paper:

- (a) February 10, 2010: Choice of newspaper article (on which the short paper is based on)
- (b) February 22, 2010: One sentence blurb on each of the above mentioned four points (i) to (iv) & at least one reference to an academic journal article that discusses this issue.
- (c) March 19, 2008: Submission of the final paper. Put hardcopy into my mailbox (Savery Room 305)

### Problem Sets:

- (a) During the quarter you will go over several problem sets which will require you to apply the topics we discuss in class and in the readings. In order to solve the problem sets some amount of math (calculus and a limited amount of statistics) is required.
- (b) You are encouraged that you work in small groups of 2 to 4 people together on the problem sets. You are required, however, to write your solutions individually. Still, you should write all the names of those students that participated in your study/problem set working group on each of the problem sets.
- (c) Grading of the problem sets: The total number of problems sets is not fixed yet. Let's say, we have in total  $M$  problem sets. For your final grade  $M-1$  problem sets will be taken into account only. The problem set that will be dropped from the evaluation is your problem set that received the least points during the quarter. So your study group can screw up once without regret.
- (d) Please write legibly or use a computer.
- (e) Generally, PSs are due 8:30am on the due date. If you miss the deadline, you'll obtain 0 points for the PS.
- (f) In exceptional cases (i.e. if you are seriously sick): then it is OK to scan your PS in a copyshop and email it by 8:30am as a PDF attachment. Alternatively you can ask your friendly classmates or someone of your study group to turn your PS in for you.

**Exams:**

There will two 110 minute midterm exams. They are tentatively scheduled for:

- (a) **Exam 1:** Wednesday, Feb 3, 2010, 8:30am-10:20am.
- (b) **Exam 2:** Monday, March 8, 2010, 8:30am-10:20am.

A small portion (typically the last 15 minutes) of these exams will be “open book”. Hence feel free to bring the required Kolstad textbook that we have used during the quarter if you think it could help you.

**Assessment & Evaluation**

Class Participation (including 2 minute papers, in class quizzes): 10%

Student Paper: 15%

Problem Sets: 25%

Midterm Test1: 25%

Midterm Test2 25%

**Location**

The location of Raitt Hall can be viewed here: <http://www.washington.edu/home/maps/?RAI>

## **Course outline**

The tentative outline of the course is as follows:

### **1. Introduction:**

What is “Environmental Economics”?

Why is it important?

A first simple model on the “Economy and the Environment”

The Laws of Thermodynamics

### **2. Environmental Problems and Policy Solutions**

Climate Change (example: see NYT article by Greg Mankiw)

Carbon Tax

Cap and Trade

Standards via Command and Control

### **3. Social Choice: How Much Environmental Protection?**

Individual Preferences Regarding Environmental Protection

Biocentrism

Anthropocentrism

Sustainability

Social Choice from Individual Values

Social Choice Mechanisms

Pareto Criterion

Potential Pareto Improvement

Compensation Principle (Kaldor Hicks)

Voting

Social Welfare Functions

Arrows Impossibility Theorem

Criticism of Utilitarianism

### **4. Efficiency and Markets**

Efficiency in the Exchange of Goods and Bads

Efficiency in Production

First Welfare Theorem

Second Welfare Theorem

Consumer and Producer Surplus

Cost Benefit Analysis

## **5. Market Failure: Public Bads and Externalities**

Public Goods and Bads

Pricing of Private versus Public Goods and Bads

Lindahl Prices and free riding

Externalities

## **6. Property Rights**

Coase Theorem

## **7. Pigouvian Fees**

Single Polluter single damage

Single Polluter multiple damages

Multiple Polluter and the Equimarginal Principle

Fees Versus Subsidies

Fees and Imperfect Competition

## **8. Regulating Pollution**

### **9. Emission Fees and Marketable Permits**

### **10. Regulation with Unknown Control Costs**

### **11. Audits, Enforcement, and Moral Hazard**

### **12. Risk and Uncertainty**

### **13. International and Interregional Competition**

### **14. Economy-Wide Effects of Environmental Regulations**

### **15. Environmental Demand Theory**

### **16. Hedonic Price Methods**

### **17. Household Production**

### **18. Constructed Markets**

## **Reading and Textbooks**

Much of the reading will consist of journal articles, that summarize key advances in the theoretical literature or provide recent empirical examples of evaluating environmental policies. The journal articles will be either posted on the teaching website or (if there are copyright issues), provided in the Odegaard library on reserve.

As textbooks for this course the following book is **required**:

Charles Kolstad: "Environmental Economics", Oxford University Press, 2000.

Also, I will draw some of the material from:

Nick Hanley, Jason F. Shogren and Ben White: "Environmental Economics, In Theory and Practice", 1997

as well as from

Barry C. Field and Martha K. Field: Environmental Economics, An Introduction. Fourth Edition, McGraw-Hill Irwin.

These books will be provided in the Odegaard library. If you would like to purchase textbooks, then I, next to the book by Charles Kolstads (that is required) I'd like to recommend the textbook by Field & Field. Kolstads book is more formal than the latter and prepares you well for mastering the mathematical part of environmental economics. The Fields & Field book is less technical but more intuitive and provides useful applications of the theory to typical environmental problems.

## **Overload Policy / Add Codes:**

Thank you for your interest in ECON 436 – Environmental Economics. Unless you are an exchange student the only way to get an add code is to show up at the first day of instruction, January 4, 8:30am. Further instructions will be provided at the beginning of the class. You must attend all classes to qualify for an add code. There is no reason to email me to get an add code, since you will simply be referred back to this page. Graduating seniors have priority together with master students, although being in one of these categories is not a guarantee that you will get an add code.

Note that there will be no exceptions to the stated prerequisites. If you do not fulfill the requirement of ECON 300 – or the equivalent if taken a comparable course at another University – there is no point in emailing me. The class will be offered again in Spring 2009.

If you are an exchange student please email me with a description of what courses you have taken and why you have an interest in taking the course. I will do my best to get back to you quickly.

### **Missed Classes:**

If you miss a class, it is your responsibility to get a copy of the lecture notes from your class mates. Please understand that I do not provide private one to one lectures or summaries via email of what has been covered in class. However, that being said, always feel free to come to my office hours with questions concerning the class material or your research ideas.

### **Help with Writing**

The Odegaard Writing & Research Center offers free, one-one-one help with all aspects of writing at any stage in the writing process. To make an appointment or browse the center's online resources, please visit: <http://www.depts.washington.edu/owrc>. Located on the third floor of the Odegaard Library, the OWRC is open Sunday through Thursday from 12:00-9:00 p.m. To make the best use of your time there, please bring a copy of your assignment with you and double-space any drafts you want to bring in. The OWRC will not proofread papers or talk with you about grades.

### **And finally a message by the UW Human Resources:**

Violence awareness and prevention remains an important issue. Please include the following information in the announcement section of 2009 -2010 course syllabi:

#### **\*UW SafeCampus\***

Preventing violence is everyone's responsibility. If you're concerned, tell someone.

- \* Always call 911 if you or others may be in danger.
- \* Call 206-685-SAFE (7233) to report non-urgent threats of violence and for referrals to UW counseling and/or safety resources. TTY or VP callers, please call through your preferred relay service.
- \* Don't walk alone. Campus safety guards can walk with you on campus after dark. Call Husky NightWalk 206-685-WALK (9255).
- \* Stay connected in an emergency with UW Alert. Register your mobile number to receive instant notification of campus emergencies via text and voice messaging. Sign up online at [www.washington.edu/alert](http://www.washington.edu/alert)

For more information visit the SafeCampus website at

\*[www.washington.edu/safecampus](http://www.washington.edu/safecampus)\*.