

**AEDE 6300: Environmental and Resource Economics**  
**Spring 2016**  
**Monday/Wednesday 12:45pm – 2:05pm,**  
**Room 246, Agricultural Administration Bldg.**

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**Office Hours:** Tuesdays 10am -Noon

If you cannot make it during office hours, I will be happy to set up an alternative time to meet with you. Email is the best way to reach me outside class.

**Course Description:**

This course provides a survey of environmental and natural resource economics. Drawing on basic principles of microeconomics, we will discuss methods for economic analysis of current natural resource management issues. The course will be divided into three sections. The first section of the course focuses on the economics of the environment, particularly the economics of pollution control. In the second section of the course, we will study the basics of natural resource economics and the capital theoretic foundations for resource management. We will look at economic analysis of renewable and non-renewable resources and the policies to manage natural resources such as fisheries and forests. Finally, we will discuss conceptual issues in sustainable development and the different normative theories of sustainability in economics.

**Prerequisites:**

It is expected that students have taken at least one intermediate course microeconomic theory. We will briefly review economic principles but I will assume that you are familiar with concepts of supply and demand, utility functions, production functions, consumer and producer surplus and deadweight loss, opportunity cost, marginal analysis, and time discounting. I will also assume you have a working knowledge of basic differential and integral calculus.

**Text Book and Readings:**

It is difficult to find a single textbook that addresses key issues in environmental and resource economics in sufficient detail. Below I list the books we will be drawing on for the course.

*Resource Economics* by Jon M. Conrad, Cambridge University Press, 1999 (“Conrad” on the remainder of the syllabus)

*Valuing the Future: Economic Theory and Sustainability*, by Geoffrey Heal, New York, Columbia University Press, Economics for a Sustainable Earth Series, 1998

*Environmental Economics* by Charles Kolstad, 2000, Oxford University Press (“Kolstad” on the remainder of the syllabus)

Economics of the Environment: Selected Readings, Edited by Robert N. Stavins, Harvard University Press, 2005

Keohane, Nathaniel O. and Sheila M. Olmstead. Markets and the Environment, Washington, D.C.: Island Press, 2007.

I will also post additional readings on the Carmen Website. You will be expected to do the readings prior to class and be prepared to participate in class discussion.

### **Evaluation**

Students will be evaluated based on 6 homework assignments, a mid-term, and a final examination. The breakdown of the total grade is as follows:

- Homework assignments: 30%
- Midterm examination: 30%
- Final examination: 30%
- Class participation: 10%

### Assignments/Problem Sets

There will be six homework assignments that will due at the beginning of class on the date assigned on the syllabus. Each assignment counts for 6% of your grade and the lowest grade will be dropped.

Students can work in groups and consult with each other when working on the problem sets but you are expected to turn in individual work. You cannot simply copy someone else’s work.

### Examinations

There will be two exams: a midterm exam and a final exam. The midterm exam will be in-class, and closed book. The final exam / project will likely be a take-home exam.

### **Excuses and Extensions**

Under ordinary circumstances late submissions will not be accepted. Please contact me in case of extraordinary situations such as

- Serious illnesses,
- Family emergencies,
- Scheduling conflicts with examinations.

**Academic Accommodations:**

Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. I do ask that, as a courtesy, students notify me at the beginning of the semester of any accommodations required. University documentation should be provided to me no later than 7 days before the first examination so that proper accommodations can be arranged.

**Academic Honesty**

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty.

Students must recognize that failure to follow the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute "Academic Misconduct." The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an "excuse" for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct. If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me. Other sources of information on academic misconduct:

- The Committee on Academic Misconduct web pages

<http://oaa.osu.edu/coam/home.html>

- Ten Suggestions for Preserving Academic Integrity:

<http://oaa.osu.edu/coam/ten-suggestions.html>

- Eight Cardinal Rules of Academic Integrity

<http://www.northwestern.edu/uacc/8cards.html>

## **Tentative Course Outline and Readings**

(Tentative because we will not be able to tackle all topics in sufficient detail and will have to make modifications as the semester progresses)

### **Week-1: Introduction to Environmental and Resource Economics**

- a. Kolstad Chapters 1, 2
- b. Fullerton and Stavins, "How Economists See the Environment," *Nature*, 1988.
- c. Krutilla, J.V. (1967), "Conservation Reconsidered," *American Economic Review* 57(4), 777-786.

### **Week-2: Market Failures, Externalities and Public goods**

- a. Kolstad, Chapters 5
- b. Hardin, G., 1968, The Tragedy of the Commons, *Science* 162
- c. Ostrom, Elinor et al. 1999. Revisiting the Commons: Local Lessons, Global Challenges. *Science* 284 (April 9) 278-282.

### **Week-3: Policy Instruments for Pollution Control: Taxes, Standards and Marketable Permits**

- a. Kolstad, Chapter 11, 12, 13
- b. Tietenberg, T.H., "Economic Instruments for Environmental Regulation," in Stavins.
- c. Goulder, L.H., "Environmental Policy Making in a Second Best Setting," in Stavins.
- d. Coase, Ronald H. The Problem of Social Cost. *Journal of Law and Economics* (October): 1-44.
- e. Stavins, R.N., "What Can We Learn from the Grand Policy Experiment? Lessons from SO<sub>2</sub> Allowance Trading," in Stavins.
- f. Sandel, M.J., "It's Immoral to Buy the Right to Pollute (with replies)," in Stavins.

### **Week-4: Introduction Dynamics, Discounting, and Natural Resources as Capital**

- a. Conrad, Ch. 1-2
- b. Goulder, L.H. and R.N. Stavins, "An Eye on the Future," in Stavins.

### **Week -5: Economics of Non-renewable Resources**

- a. Conrad, Ch. 5
- b. Solow, R.M. (1974), "The Economics of Resources or the Resources of Economics," *American Economic Review* 64(Proceedings)

### **Week-6: Open Access and Common Property Resources**

- a. Gordon, H. S. (1954), "The Economic Theory of a Common-Property Resource: The Fishery," *Journal of Political Economy* 62, 124-142.
- b. Hardin, G., "The Tragedy of the Commons," in Stavins.

### **Week-7: Midterm Exam**

### **Week-8: Economics of Renewable Resources – Fisheries**

- a. Conrad, Chapter 3
- b. Grafton, R.Q. (1996) "Individual transferable quotas: theory and practice" *Reviews of Fish Biology and Fisheries* 6:5-20, available at: <http://www.springerlink.com/content/j616h675417752m8/fulltext.pdf>
- c. Wilen, J.E. (2006) "Why fisheries management fails: treating symptoms rather than the cause" *Bulletin of Marine Science* 78:529-46, available at: <http://www.ingentaconnect.com/content/umrsmas/bullmar/2006/>
- d. Sanchirico, J.N. and M.D. Smith, and D.W. Lipton, "Managing Fish Portfolios," *Resources*, Winter 2007, in RFF.
- e. Holland, D.S. and K. Schnier (2006), "Individual habitat quotas for fisheries" *Journal of Environmental Economics and Management* 51:72-92.

**Week-9: Economics of Renewable Resources – Forests**

- a. Conrad, Ch. 4
- b. Vincent, J.R. (1992), "The Tropical Timber Trade and Sustainable Development," *Science* 256: 1651-1655
- c. Samuelson, P.A. (1976), "Economics of Forestry in an Evolving Society," *Economic Inquiry* 14, 466-492

**Week -10: SPRING BREAK**

**Week -11: Introduction to Sustainability**

- a. Solow, R.M., "Sustainability: An Economist's Perspective," in Stavins.
- b. Arrow, K. et al. (1995), "Economic growth, carrying capacity, and the environment," *Science* 268, 520-521.
- c. Geoffrey Heal, (2012) Reflections—Defining and Measuring Sustainability, *Review of Environmental Economics and Policy*
- d. A Layperson's View of 'Sustainability', in *Our Common Journey*

**Week -12: Introduction to Ecological Economics**

- a. K.E. Boulding, "The Economics of the Coming Spaceship Earth," in *Environmental Quality in a Growing Economy*, The Johns Hopkins University Press, 1966. – excerpts.
- b. R.B. Howarth and R.B. Norgaard, "Intergenerational Resource Rights, Efficiency, and Social Optimality," *Land Economics* 66, 1-11, 1990.

**Week -13: Sustainability: Concepts and Interpretation of Renewable Resource Models**

- a. Heal Chapter 1, Chapter 5

**Week -14: Non-constant discounting**

- a. Heal Chapter 2, Chapter 7
- b. M.L. Weitzman, "Gamma Discounting," *American Economic Review* 91(1), 260-271, 2001

**Week-15: Advanced topics on resource management**

- a. Invasive Species
- b. Coastal Adaptation