Environmental Economics
Time: 0815-0905 Room: RENH 206

Instructor: Eric Schuck, Ph.D.
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Office Hours: 0930-1030 MTuWTh
1400-1530 MTuWTh
By Appointment

Tom Tietenberg and Lynn Lewis
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Selected Readings and Handouts provided by the Instructor

Course Description: This course introduces students to how economic principles can be applied to environmental problems. It shows how the economic concept of marginalism can be used to value and potentially solve problems of air pollution, water quality, and related natural resource allocation issues.

Linfield Curriculum Designation: This course provides four credits toward fulfilling the Individuals, Systems, and Societies (IS) and Quantitative Reasoning (QR) modes of inquiry within the Linfield College Curriculum. As specified on page 8 of the Linfield College Course Catalog 2009-2010, students who complete this course will have the opportunity to:

Individuals, Systems, and Society:
1) Think critically about the ways that society affects individual behavior and individual behavior affects society
Through lectures, examinations, homeworks, and discussions, students will learn how individual and social decisions regarding the use and disposition of productive resources affects the environment, and how answering the basic questions of economics - what is produced, how much is produced, to whom and how is it distributed, and at what cost (in both an accounting and social sense) – affects the natural system in which we live. Specific attention will be paid to trade-offs between private and social measures of welfare and between notions of economic efficiency versus economic equity as they relate to environmental quality.
2) Understand the relationships among individual, systemic, and social processes
Through lectures, examinations, homeworks, discussion, students will learn how systems of ownership and management of productive resources lead to different types of environmental issues. Students will also be exposed to a simultaneous and symbiotic interpretation of the relationship between the economy and the environment in contrast to a competitive interpretation of the relationship.
3) Articulate how key theoretical principles can be used to explain individual and social processes, inform public policy and/or develop practical approaches to human problems across regional, national, and/or global contexts.
Through completion of the term environmental valuation project, students will examine how different systems of incentives and property rights lead to different levels of environmental quality, and how improvements in property rights and market information can be used to improve environmental quality. Students will also explore how properly focused market forces and incentives can encourage environmental preservation and restoration at levels beyond those feasible through command and control regimes alone.

**Quantitative Reasoning:**

1) **Pose questions involving quantitative relationships in real-world contexts by means of numerical, symbolic, and/or visual representations.**

Through lectures, examinations, and homework assignments, students will learn how to represent complex interactions between producers and consumers in graphical forms and how the interactions of producers and consumers affect the environment. Students will also learn how to identify and to interpret different types of market failures and their corresponding effects on the environment through graphs.

2) **Analyze problems by discussing models; making appropriate assumptions; and deducing consequences or making predictions.**

Through examination of graphs representing differing levels of information and property rights, students will learn how different market structures lead to different outcomes in terms of both production decisions and environmental quality. Students will then learn how to predict, to qualify, and to compare market outcomes given different sets of institutional settings and informational constraints relative to their effects on the environment.

3) **Understand the uses and constraints of various representations of quantitative information.**

Through examination of graphs representing consumers and producers with varying levels of information, differing levels of property rights, and alternative levels of market power, students will learn under what circumstances economics can and cannot predict the effects of the economy on the environment and vice versa.

4) **Communicate and critique quantitative arguments.**

Through completion of the term valuation project, students will be asked to develop real-world economic values for environmental amenities using a variety of accepted economic valuation techniques. Students will be asked to compare and to critique these values and to explain their potential use and limitations in setting environmental policy, especially their use in reducing or minimizing market failures that lead to socially undesirable effects on the environment.

**Pre-Requisites:** ECON 210 or equivalent.

**Course Objective:** At the end of this course, students should have a basic understanding of what economics can contribute to environmental management, particularly in terms of valuing and comparing alternative environmental management approaches. Students should have an understanding of how markets, and specifically market failures, contribute to both the creation and reduction of environmental problems around the globe. More critically, students will be able to identify and discuss different approaches to improving economic decision-making as it relates to environmental quality with a solid understanding of the relative merits of different approaches, not only in terms of economic efficiency but also in terms of environmental and social equity terms.

While study will be focused on the specific area of environmental economics, students will also develop the following general proficiencies:
1) **Gain access to economic knowledge.** Through the completion of the assigned readings, article reviews, and completion of the environmental journal, students will be required to locate and utilize published environmental economics information;

2) **Display command of existing economic knowledge.** Through the completion of examinations, the environmental economics journal, the valuation project and participation in class discussions, students will be required to explain and apply theoretical concepts, summarize current conditions, summarize economic policy options, and synthesize economic theories as they apply to economic management of environmental problems;

3) **Utilize economic knowledge to explain economic issues.** Through completion of the environmental economics journal and the valuation project, students will analyze environmental economics issues, identify potential policy solutions, and briefly explain the relative merits and potential problems associated with possible policy options.

4) **Create new economic knowledge.** Through completion of the environmental valuation project, students will utilize newly learned economic valuation to develop non-market values for environmental goods and services not fully covered through market values, creating new economic knowledge assigning values to previously under- or un-valued environmental goods and services.

**Tentative Course Outline:**

**Section 1: Basic Tools of Environmental Economics**

1. Intro: Economics and the Environment
   - READINGS: T & L, Ch. 1
2. Valuing the Environment: Concepts
   - READINGS: T & L, Ch. 2
3. Market Failures
   - READINGS: T & L, Ch. 4
4. Valuing the Environment: Methods
   - READINGS: T & L, Ch. 3
5. Economic Tools for the Environment
   - READINGS: T & L, Ch. 14
6. Sustainability
   - READINGS: T & L, Ch. 5

**Section 2: Applied Environmental Problems**

7. Development and Environmental Quality
   - READINGS: T & L, Ch. 20
8. International Trade and the Environment
   - READINGS: To be assigned by instructor
9. Global Climate Change
   - READINGS: T & L, Ch. 16
10. Air Pollution
    - READINGS: T & L, Ch. 15
11. Economics of Water Quantity and Quality
    - READINGS: T & L, Ch 18 and readings provided by the instructor
**Course Evaluation**: Grades in the course will be determined through a combination of in-class quizzes, periodic homework, midterm and final examinations, and an economic journal writing project. Weighting will be as follows:

- Environmental Journal/Homeworks: 15%
- Non-Market Valuation Project: 20%
- Quizzes: 20%
- 1 Midterm Exam: 20%
- Final Exam: 20%
- Reflective Essay: 3%
- Course Participation: 2%

The midterm exam will be announced two weeks prior to the date upon which the exam will be held; one or two quizzes will be held in the weeks prior to the midterm or final to prepare students for these examinations. The journal project will be explained in more detail later, but will involve writing short (2-page) essays on news articles related to topics being discussed in class and following a specific rubric. These will occur every 2-3 weeks, and students will complete 4-5 essays during the course of the semester. Homework will generally be quite brief, and will be used to determine if students understand a particularly difficult topic without the stress of an exam. The valuation project will involve small groups designing and implementing an environmental valuation study using the tools taught in class. Final grades will be determined as follows: 100% >= A >= 90%; 90 > B >= 80%; 80 > C >= 70%; 70 > D >= 60; 60 > F. This grade distribution may use +/-’s or be moved downward at the instructor’s discretion.

**COMMENTS:**

1. The final exam is non-cumulative and may not be rescheduled. It is scheduled for this room, Monday, 23 May at 0800.
2. Late work will be accepted only with the prior approval of the instructor. Exceptions will be made for emergencies and regularly scheduled College events, but it is the student’s responsibility to notify the instructor in a timely and efficient manner. Unless otherwise indicated, all work is due at 2359 on the assigned due date.
3. Course material will be distributed via the course e-mail list when and as it is completed. Do not ask for course material prior to the topic being covered in lecture. Lecture material is intended to supplement and to clarify materials in the book and is not a substitute for the book.
4. Dr. Schuck is an officer in the Naval Reserve. This may require rescheduling of portions of the class, and your forbearance is greatly appreciated.
5. The instructor tends to give assignments with relatively brief instructions. If you are in the least bit confused, do not hesitate to ask for clarification or to ask for a review of your work prior to turning it in for final evaluation.
6. Cell phones, PDA’s, iPods, and other electronic devices will be turned off during the class. Failure to comply with this policy will result in the confiscation and potentially the destruction of the offending device.
7. Learning is a collaborative process and you are encouraged to cooperate with your fellow students in your coursework where appropriate. However, you should be aware that this course strictly adheres to the college policy on academic honesty, as published in the Linfield College Course Catalog. This means you are ultimately responsible for your own work and neither cheating nor plagiarism, as defined in the College Catalog, will be tolerated. Incidents of cheating or plagiarism will be reported to the relevant College authorities, will result in a failing grade for the assignment or evaluation in question, and may result in a failing grade for the course. The instructor reserves the right to keel haul offenders.
8. Students with disabilities are protected by the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. If you are a student with a disability and feel you may require
academic accommodations contact Cheri White, Assistant Director of Learning Support Services (LSS), within the first two weeks of the semester to request accommodations. LSS is located in Walker 124 (503-883-2444). You are also strongly encouraged to communicate with the instructor about any accommodations and/or any special needs you may need during your time in this class.