Natural Resource Economics
Time: TuTh, 1435-1615 Room: TJ Day Hall 103

Instructor: Eric Schuck, Ph.D.
Office: 304 TJ Day Hall
Phone: 503-883-2385
E-Mail: ESchuck@Linfield.edu

Office Hours: Tuesday and Thursday, 3:30-4:30
Friday: 9-10 a.m. and 1 p.m. to 3 p.m.
By Appointment

Textbook: Environmental and Natural Resource Economics
Ward
ISBN-10: 9780131131637
Selected Readings and Handouts provided by the Instructor

Course Description: This course introduces students to how economic principles can be applied to natural resource problems. It shows how the economic concept of marginalism can be used to identify how best to preserve natural resources such as land, water, minerals, fisheries, rangeland and forests over time while still recognizing their potential value to society as productive inputs in the present.

Linfield Curriculum Designation: This course will examine how individuals, groups, and countries make decisions to strike a balance between the potential economic growth gained from using natural resources in the present against the potential gains to future generations from conservation and preservation. This course will also examine how best to manage natural resources such as land, water, minerals, fisheries, and forests to meet the larger needs of society while simultaneously respecting the interests of the individuals and firms in society. As such, this course provides four credits toward fulfilling the Individuals, Systems, and Societies (IS) or Quantitative Reasoning Requirement (QR) as defined on pages 6-7 of the Linfield College 2010-2011 Catalog.

The specific learning goals and objectives of this course are:

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 natural resources as productive inputs affects the natural system, and how answering the basic questions of economics - what is produced, how much is produced, to whom and how it is distributed, and at what cost (in both an accounting and social sense) – are different when long run effects on natural resource availability are included in production and distribution decisions. Specific attention will be paid to trade-offs between short-run and long-run notions of productive efficiency for both renewable and non-renewable resources.

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 levels of resource
conservation and different rates of resource usage. Students will also be exposed to a simultaneous and symbiotic interpretation of the relationship between the economy and the environment as a source of productive inputs whose use must be balanced over time.

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 natural resource study project, students will examine how different systems of incentives and property rights lead to different rates of usage and price growth in natural resources over time, and how improvements in property rights and market information can be used to promote conservation of resources in the long run. Students will also explore how properly focused market forces and incentives can encourage natural resource conservation and management 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 level and quantity of natural resources available over time. Students will also learn how to identify and to interpret and to explain optimal resource use paths in both graphical and mathematical settings.

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 natural resource use rates over time. 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 natural resource conservation.

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 natural resource conservation and vice versa.

4) Communicate and critique quantitative arguments.

Through completion of the natural resource management project, students will be asked to develop real-world economic projections for natural resource use rates and price trajectories using a variety of accepted economic models. Students will be asked to compare and to critique their management plans and to explain their potential use and limitations in setting natural resource usage policy, especially their use in promoting conservation and natural resource use rates that are socially efficient over time.

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 natural resource management, particularly in determining how to balance the competing interests of using natural resources in the present against the value of conserving them for the future. Students should have an understanding of how markets, and specifically market failures, can lead to overuse in the present relative to what is socially optimal over time. More critically, students will be able to identify and discuss different approaches to improving economic decision-making as it relates to the use and preservation of natural resources for socially beneficial production over time, both in terms of economic efficiency but also measured through social equity.
While study will be focused on the specific area of natural resource, students will also develop the following general proficiencies:

1) *Gaining access to economic knowledge.* Through the completion of the assigned readings, article reviews, and completion of the natural resource journal, students will be required to locate and utilize published natural resource economics information;

2) *Displaying command of existing economic knowledge.* Through the completion of examinations, the natural resource economics journal, the natural resource conservation/use 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 natural resource problems;

3) *Displaying the ability to draw out existing economic knowledge.* Through completion of the natural resource economics journal and conservation/use project, students will required to read, interpret, analyze and discuss information pertaining to natural resource economics from both the popular press and economic journals, both refereed and non-refereed, and will be required to show a working familiarity with the methods economists use to manage the competing interests of use and preservation in natural resources;

4) *Utilizing existing economic knowledge to explain economic issues.* Through completion of the natural resource economics journal and the conservation/use project, students will analyze natural resource economics issues, identify potential policy solutions, and briefly explain the relative merits and potential problems associated with possible policy options.

**Tentative Course Outline:**

**Section 1: General Natural Resource Economics**

1. Intro and Economics Refresher:  
   READINGS: Ward, Ch. 1 pp. 2-3; Ward, Ch. 3  
2. Institutional Breakdown  
   READINGS: Ward, Ch. 4  
3. Benefit/Cost and Valuation  
   READINGS: Ward, Ch. 5  
4. Discounting  
   READINGS: Ward, Ch. 6

**Section 2: Applied Natural Resource Problems**

5. Mineral Economics  
   READINGS: Field, Ch 10  
6. Forest Economics  
   READINGS: Ward, Ch 8; Field, Ch.12  
7. Fisheries Economics  
   READINGS: Ward, Ch. 12  
8. Food Economics  
   READINGS: Ward, Ch. 11  
9. Water Economics  
   READINGS: Ward, Ch. 10 and Readings Assigned by Instructor  
10. Energy Economics  
    READINGS: Ward, Ch. 13  
    Readings Assigned by Instructor  
11. Rangeland Economics  
    READINGS: Ward, Ch. 9

**Course Evaluation:** Grades in the course will be determined through a combination of in-class quizzes, periodic homework, midterm examinations, and an economic journal writing project. Weighting will be as follows:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Resource Journal/Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Resource Management Project</td>
<td>15%</td>
</tr>
</tbody>
</table>
### Quizzes
2-4 Quizzes 20%

### Midterm Exam
1 Midterm Exam 20%

### Final Exam
Final Exam 20%

### Reflective Essay
Reflective Essay 5%

The midterm exam will be announced two weeks prior to the date upon which the exam will be held. The journal project will be explained in more detail later, but will involve identifying a general natural resource management theme to follow for the semester and writing biweekly reports on that theme, trying to tie news reports and developments occurring about that theme to topics discussed in class. 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 resource management project will be a small group project and will involve preparing and presenting a briefing paper on a natural resource management problem to the class for discussion. 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 scheduled for this classroom Tuesday, Dec 13th 2011 at 1530 hours.
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 without causing confusion and delay. Unless otherwise indicated, all work is due no later than 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. 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.
5. Dr. Schuck is occasionally gone on Fridays for military duty and this may require rescheduling of some office hours. Your tolerance is greatly appreciated.
6. Unless specifically required for learning purposes and cleared with the instructor, cell phones, PDAs, iPods, etc. will be turned off in class. The instructor reserves the right to confiscate and, if necessary, to destroy offending electronic equipment.
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.
9. If you matriculated into the College in Fall 2010 or later, in order to receive credit within the Linfield Curriculum for this course, you must complete the electronic submission of exemplar work and supporting descriptions by the last day of finals week, as discussed in the Linfield College Course Catalog.