

Course Syllabus

AGEC 5630: Advanced Natural Resource Economics

Fall 2014

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CLASS TIME/PLACE: Tu/Th 2:45 to 4:00 pm. AG 2024.

OFFICE HOURS: Tu/Th 1:00-2:00pm & 4-5pm; Wed 1:00-3:00pm; “OPEN DOOR” drop-in or by appointment.

COURSE PREREQUISITES: Intermediate Macro/Microeconomics (ECON 3010/3020 or equivalent); a Statistics Course (STAT 2010, 2050, or 2070); and a Calculus Course (MATH 2350 or 2200). Graduate Standing or Consent of Instructor.

COURSE DESCRIPTION: An in-depth treatment of theoretical issues, quantitative techniques, and institutional arrangements in the natural resource field. Topics include optimality in resource management, welfare economics, property rights, market failure and externalities as well as benefit cost analysis.

DISABILITY STATEMENT: If you have a physical, learning, or psychological disability and require accommodations, please let the instructor know as soon as possible. You must register with, and provide documentation of your disability to University Disability Support Services (UDSS) in SEO, room 330 Knight Hall.

INSTRUCTOR'S PHILOSOPHY OF EDUCATION: Learning has active and passive components. Passive forms include reading and listening to lectures. Active forms include in-class discussion, studying, work on assignments, paper writing and group work. I intend to incorporate both types into this class. I will make every effort to assist students in this course.

COURSE OBJECTIVES:

1. To develop an understanding of the historic and contemporary political, cultural, social and economic context in which natural resource policy has evolved and is evolving.
2. To utilize economic theory to evaluate specific resource market outcomes and public policy initiatives.
3. To understand the limits of market applications in efficient allocation and production/consumption as well as in institutional, distributional and temporal contexts.

Academic Honesty and Plagiarism

The University of Wyoming is built upon a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated [from the UW General Bulletin]. Teachers and students should report suspected violations of standards of academic honesty to the instructor, department head, or dean. Other University regulations can be found at:

<http://uwadmnweb.uwyo.edu/legal/universityregulations.htm>

TEXTBOOKS: Resource Economics 2nd edition by Jon Conrad and Resource Economics 3rd edition by John Bergstrom and Alan Randall.

OTHER READINGS: The course is based upon the principal texts and in-class notes with additional reading material assigned as the semester progresses. Materials will be made available through the WYOWEB Course Site, by class handouts or reserved reading at Coe Library. Most notable among the other readings are the following:

- Land Resource Economics, by C. Van Kooten; (HD156.V36)
- Economics of Natural Resources and the Environment by D. Pearce and R. Turner; (HC79E5.P37) AND
- Integrated Public Lands Management by J. Loomis; (HD221.L66)

The above bulleted books are *on reserve at Coe Library* (See AGEC 5630; Don McLeod).

WORK ASSIGNMENTS	% OF GRADE
1. Two Take Home Exams (20 % each) Covers general topics, pertains to theory with problem solving.	40%
2. Four Homework Assignments (5 % each) Based on Conrad Text	20%
3. One Article Summary/Critique See explanation below	20%
4. Comprehensive Take Home Final Weighted toward last third of course material	<u>20%</u>
	100%

It is clear from this work format that exposure to theory and skill building in the **first half** of the class is essential to analytical work in the **second part**.

POLICY ON WORK, MISSING EXAMS OR WORK COMPLETION DEADLINES: All work is to be the student's own. Request and justification to take an exam late or hand in late work must be made at least three days prior to the scheduled date. If an emergency arises, I must be contacted within two days following the assignment/exam due date. Otherwise late work will be given half of the earned grade.

COURSE OUTLINE:

Topic One A Brief Introduction: Definitions, Background and

Classification of Resources. Resources as inputs and as consumer goods.

Topic Two Welfare Economics: Review of Production and Consumption.

Combining Production and Consumption.

Topic Three Property Rights, Liability and Resource use/management.

Topic Four Externalities/Market Failure: Theory, Multiple-Use and Legal Considerations.

Topic Five Dynamic Management: TIME and Intergenerational Considerations

including the role of Technology and Discount Rates with a look at Dynamic Models.

Topic Six Benefit Cost Analysis: How they are conducted and used.

Topic Seven Nonrenewable Resources: Types and Management.

Topic Eight Renewable Resources: Types and Management.

Topics Seven-Eight will be discussed with respect to the effect of the following on resource supply and demand:

Market Prices,
Extraction Costs,
Taxes,
Backstop Technologies/Substitutes,
Interest Rates,
Exploration/Marketing, and Policy Considerations for Resource Management.

NOTE: This is an advanced economics course that surveys a broad set of topics. The intent is to tie economic theory and quantitative analysis with resource management. Additional skills and experiences may be necessary to provide practical “on the ground” resource-specific management decisions.

READINGS FOR ADVANCED NATURAL RESOURCE ECONOMICS

NOTE: Text assignments in *Conrad as well as Bergstrom and Randall (and any other specifically designated readings)* are deemed **REQUIRED** reading (denoted in **BOLD**). SKIM in the far right column denotes additional readings that are recommended to supplement required ones and may help with overall understanding, class assignments and projects. Other helpful readings will also be shared. It will be up to the student’s own discretion whether such additional readings ought to be read: *careful, learning is a contagious and terminal condition!*

READING ASSIGNMENT

I. Introduction

Bergstrom and Randall Chap. 1-4

Conrad Chap. 1

Van Kooten Chap. 1 (reserve)

SKIM

Stevens Chap 1&2 (WYOWEB AGECE 5630 Course Site)

II. Welfare Economics and Pareto Efficiency

Bergstrom and Randall Chap. 5-6

Van Kooten Chap. 3 (reserve)

SKIM

**Welfare Economics, Pareto Efficiency,
Graphs, and EV-CV examples (4 Items on Course Site)**

III. Property Rights and Public Goods

Bergstrom and Randall Chap. 9

Van Kooten Chap. 4 (reserve)

SKIM

Loomis Chap. 1-5 (reserve)

SKIM

EXAM #1 MATERIALS OVER TOPICS I – III

***Given 10/2 by 5pm,
Due 10/7 by Noon***

IV. Externalities/Market Failure

Bergstrom and Randall Chap. 10

Loomis Chap. 3 (reserve)

SKIM

Van Kooten Chap. 4 (reserve)

SKIM

CONRAD HW #1 (E1.1; E1.2, E1.3 pp.34-36)

Due 10/21 Midnight

V. Discounting and Time

Conrad Chap. 2

Bergstrom and Randall Chap. 7

Van Kooten Chap. 5 (reserve)

CONRAD HW #2 (E2.3 pp. 70-71)

SKIM

Due 11/4 Midnight

VI. Benefit Cost Analysis

Bergstrom and Randall Chap. 12

Van Kooten Chap. 5 (reserve)

Loomis Chap. 6 (reserve)

BCA Overview (Handout)

Additional Readings

SKIM

SKIM

EXAM #2 MATERIALS OVER TOPICS IV – VI

Given 11/6 by 5pm,

Due 11/11 by Noon

NOTE: No Class Thursday 11/27 (Holiday)

CONRAD HW #3 (E2.5 pp. 71-74)

Due 11/20 by

Midnight

VII. Non Renewable Resources

General: **Bergstrom and Randall Chap. 14**

Conrad Chap. 5

Pearce & Turner Chap. 16;

Chap 18 (Reserve)

--Theory Oriented--

SKIM

SKIM

Land Use: Van Kooten Chap. 11-12 (Reserve)

SKIM

CONRAD HW #4 (E4.2 pp. 151)

Due 12/4 Midnight

VIII. Renewable Resources

General: **Bergstrom and Randall Chap. 15**

Forestry: **Conrad Chap 4**

Van Kooten Chap. 14 (Reserve)

SKIM

Wildlife/Fisheries: **Conrad Chap 3**

Pearce & Turner Chap. 17 (Reserve)

PAPER ASSIGNMENT

Due 12/11 by Midnight

FINAL EXAM IS COMPREHENSIVE

Given 12/9 by 5pm,

Due 12/15 by Midnight

READINGS: Yes there are lots of them. My duty is to alert you to important concepts and applications from a variety of sources; some presentations of a concept may make more sense to YOU than others. I offer a variety of ways for you to engage the course materials.

The SYLLABUS is subject to change. Modifications will be provided in class, well in advance of work or coverage of topic(s).

PAPER ASSIGNMENT

Objectives:

To investigate the natural resource management literature to understand better the economic research being performed: relating how theory is applied and how analysis is conducted. To facilitate existing graduate research or thesis projects.

Output:

Each paper consists of a joint summary and critique of an article, concerning either a particular nonrenewable or a renewable resource issue. The goal of this exercise is to familiarize students with current economic theory, measurement and legal thought associated with a resource of his or her choice. The articles must be from after 1995. Hopefully students will seize this opportunity and analyze a key paper germane to their own graduate research.

I.E. What is assumed? Is there any opportunity for practical applications from this work? Is this a new technique for analyzing a problem or a new application of an existing technique? Could this assist a resource manager in the field? Does this address a market, an institutional or some other aspect of resource management? Do any specific laws/policies play a role in this analysis? How so for any of the above.....

Format:

The assignment, student name and date are to be placed on a separate title page. Part one is a brief introduction defining the topic or problem the article addresses (1/2 to 1 pp.). Part two is a brief summary of the article (1 ½ to 2 pp.). Part three is to consist of a critique of the article using course concepts in natural resource economics (2 to 3 pp.). **Part three** is the most important!

A copy of the article is to accompany the paper. The final product is to be a WORD file (plus the pdf of the target article). The paper will be no longer than five (5) double-spaced single-sided pages with one inch margins, 12 point times new roman font (the length limit does not include the title page, graphs, equations or diagrams although the relevance of each must be explained in the text). The paper will be evaluated on the basis of content with particular emphasis on the quality of the analysis. It is expected that the paper will be carefully edited as well as free of grammatical and spelling errors.

Please share candidate article(s) as pdf attachment prior to beginning your paper; i.e. no later than November 1st.

PAPER TOPICS: Choose one of the following.....

(1) Topics in Nonrenewable Resource Economics

Due 12/11 Midnight. Land Use, Oil/Gas and Minerals.

OR

(2) Topics in Renewable Resource Economics

Due 12/11 Midnight. Wildlife/Fisheries, Forestry.

The analysis should include a discussion of several of the following (based on relevance in the chosen article): Market Prices, Extraction Costs, Externalities, Opportunity Costs, Taxes, Backstop Technologies/Substitutes, Legal issues, Policy issues, Discount Rates and Exploration/Recycling/Marketing Considerations.

Possible Sources: [Try Google Scholar: the Resource (e.g. forestry, energy,...) + Economics as a key search word], the Libraries have research personnel that are very helpful with key word searches

J of Agriculture and Applied Economics

J of Agricultural and Resource Economics

Australian J of Agricultural Economics

Canadian J of Agricultural Economics

American J of Agricultural Economics

European Review of Agricultural Economics

Land Economics

Agricultural Resource and Economic Review

Resource and Energy Economics

J of Economics and Environmental Management

J of Environmental Management

Ecological Economics

Environmental Technology and Economics

Transactions of North American Wildlife Society

Society and Natural Resources

J of Wildlife Management

J of Range Management/Now Rangeland Ecology and Management

Forest Science

J of Forestry

Choices

Rangelands

Conservation: forests, water, soils, minerals

Environmental Management

Economic Geology

Review of Economic Geology

J of Soil and Water Conservation

Review of Agricultural Economics/Now Applied Economic Perspectives and Policy

Western Economics Forum

Others??

CONRAD HOMEWORK ASSIGNMENTS

McLeod is free for consultation during office hours or by appointment. If you work together, then you work together. But I would advise trying the problems initially on your own and developing a rationale or individual strategy to discuss with your colleagues and McLeod (if necessary).

FOR ALL OF THE FOLLOWING ASSIGNMENTS:

Solve for the questions as posed in as many spreadsheets as needed.

Provide all pertinent graphs (e.g. harvest, stock, PVNB trends, others?) in your **Spreadsheets**.

Explain briefly what is occurring in each problem:

- Define all variables and indicate any preset values or functions of transition (growth or depletion);
- Indicate how the problem was analyzed identifying objective function and constraints; and
- Provide a full explanation of the results indicating what they mean.
- Put all above bulleted items in your **WORD Document!**

E-mail both the spreadsheet(s) and a single WORD narrative document for your work.

Make certain the e-mail describes where in the documents I am to find the various solutions.

EXAMS

The two midterm and the final exams are take home exercises. There will be several multi-part questions: some will be required, others will allow choices. (Any question chosen must be completed in its entirety). All course materials are fair to use but you are not to consult with classmates or faculty or ANY other human being, extraterrestrial or other life form. This is to be your work and your opportunity to demonstrate your ability to learn, solve and communicate.

In providing your answers include the following:

- Electronically submitted in WORD document (spreadsheets and pdf diagrams can also be included);
- Problem summary and assumptions you employ;
- Problem set up including explanation of variable definitions; objective functions; and constraints; as well as pertinent laws, regulations and/or institutional considerations;
- Solution techniques as the means by which first order conditions are found; simulation conducted; or calculations produced;
- All diagrams are at least half a page in size and clearly labeled, marked and defined;
- Show all work; and
- **EXPLAIN THE RESULTS AND INTERPRET.**