

Economics 435
Natural Resource Economics
Autumn 2018
Professor Robert Halvorsen

ECON 435 is a survey of the economics of natural resources. Topics include renewable resources, such as fish and trees; nonrenewable resources, such as oil and copper; environmental resources, such as clean air and water; and ecological resources, such as biodiversity and endangered species. A principal theme in analyzing these topics is the determination of the optimal trade-offs between the benefits and costs of resource use, with special emphasis on trade-offs between current and future resource use and the implications for sustainability.

Two, non-cumulative, exams will count for 70% of the course grade, with the (curved) grade for the exam on which you do better receiving a weight of 0.6 in calculating the overall exam grade and the exam on which you do worse receiving a weight of 0.4. Last Quarter's exams are posted on Canvas and can be used both as a preview of the types of questions that will be asked and as sources of practice questions in studying for this Quarter's exams. **Please refer to the next page for very important information concerning the rules for taking exams and policies with respect to academic integrity. Note especially the information concerning cell phones.**

Six in-class quizzes will account for 20% of the course grade and eight problem sets will account for 10%. Detailed answer sheets will be provided for the problem sets and quizzes. Previous students have frequently reported that doing the problem sets and reviewing the answer sheets was a very good way to learn the course material.

The syllabus contains a detailed schedule of lectures, quizzes, and exams. The dates may be revised as the Quarter proceeds except for the final exam, which will be on the last day of class, Wednesday, December 5th.

There is no textbook or course-pack for this course. Lecture notes for the Quarter are posted on Canvas. The syllabus, practice exams, problem sets, answers to problem sets and quizzes, as well as other course materials, will also be posted there.

If you have any questions at any point during the course, my office hours during the Autumn Quarter are 10:00-11:00 on Monday, Tuesday, and Friday in Savery 351. An appointment to meet at another mutually convenient time can be made in person after class, by phone at 543-5546, or by email at halv@uw.edu. Email can also be used to ask any short questions that may arise as you review your notes or work on the problem sets.

Exam Rules

I Exam Absence Policy

1. If you are unable to make it to an exam period due to illness or another unexpected happening, do the following:
 - i. Notify me no later than the time of the exam that you are not able to take the exam and why.
 - ii. If you missed the exam for health reasons, you need to show me a note issued by a medical professional documenting the reason you missed the exam.
 - iii. If there was some other reason for missing the exam, come and see me to explain the reason. You will need to show appropriate documentation. Not waking up or missing your bus/plane is not an acceptable excuse.
2. If you know that you are going to be away due to a University-related activity, such as participation in an away sport or debate, let me know well in advance so that arrangements can be made.

II Exam Taking Rules

1. Material allowed during an exam.
 - i. You must use a large bluebook for your answers.
 - ii. All books, papers, notebooks, etc., must be placed inside your backpack or other type of bag, which must be securely and fully closed. If you do not have a bag, you must place all your material out of your reach.
 - iii. No electronic devices, including calculators, can be accessible during the exam. Cell phones must be turned off and placed in your closed bag (not in your pocket). **If your cell phone is observed at any point during the exam, your exam will be taken away and assigned a grade of zero.**
 - iv. Baseball caps and any other kinds of headgear that conceal your eyes are not permitted.
2. Attendance and special accommodation
 - i. You are not allowed to leave the room during the exam. This includes restroom use; be sure to use the restroom before the beginning of the exam.
 - ii. If you arrive late to an exam, you cannot expect to get extra time after the official end of the exam to make up for the missing time at the beginning.
 - iii. If you have a documented disability, please show me documentation from the Office of Disability Resources for Students on the first day of class, so that I can make any arrangements required for accommodations.

III Academic Integrity

1. Exams are individual work and cheating will not be tolerated. Looking at notes or your neighbors' answers will result in the immediate termination of your exam time and a grade of zero for the exam.
2. Altering an exam before submitting it for a review of the grading, obtaining an advance copy of an examination, or arranging for a surrogate test-taker are all flagrant violations of University policy.
3. Cheating of any kind may result in expulsion from the University. The Department will follow University policy in case of academic misconduct. I strongly recommend that you review University policy at <http://www.washington.edu/uaa/advising/help/academicintegrity.php>. Students found to have engaged in academic dishonesty will be subject to sanctions, which range from a disciplinary warning to permanent expulsion from the University, depending on the seriousness of the misconduct.

Lecture and Exam Schedule

Dates shown for lectures and the mid-term exam are subject to revision.

September 26th: Lecture 1:

Preview of some provocative results

Microeconomic theory of policy evaluation

Economic efficiency and equity

Private markets and efficiency

October 1st: Lecture 2

Dynamic efficiency

Present value analysis

October 3rd: Lecture 3

Nonrenewable resources

Condition for optimal extraction

Review with solved problem

Derivation of marginal net benefit

October 8th: Lecture 4 and Quiz 1

Effect of constant extraction cost

Comparative dynamics

Monopolistic extraction

October 10th: Lecture 5

Effects of taxes

Effects of subsidies

Effects of externalities

October 15th: Lecture 6 and Quiz 2

Rate of discount

Threat of expropriation

Limitation on future price

Forestry Economics

Renewable vs nonrenewable resource

Growth function

Derivation of the optimal harvesting age

October 17th: Lecture 7

Comparative statics analysis:

Standing value

Value of land in an alternative use

Harvesting with replanting

October 22nd: Lecture 8 and Quiz 3

Sources of inefficiency

Recycling and the stock of trees

Deforestation

Economics of the Environment

Pollution diagram

October 24th: Lecture 9

Coase theorem

October 29th: In-class review for first exam

October 31st: First exam covers material through forestry economics

November 5th: Lecture 10

Policy instruments: MB and MD curves known

Policy instruments: MB and MD curves not known

Economics of Fisheries

Property rights

Fish Biology

Sustainable yield as a function of stock

Dynamic analysis of optimal stock and harvest

Optimal vs. market outcomes

November 7th: Lecture 11

Sustainable yield as a function of effort

Total revenue and total expenditure

Efficient vs. open-access level of effort

Perverse open-access results

November 12th: Veterans' Day

November 14th: Lecture 12 and Quiz 4

Qualifications to result that net benefit equals zero

Goals of public policy

Effort function

Command and control instruments

November 19th: Lecture 13

Economic incentives

Sustainability

Definition

Desirability

November 21st: Lecture 14 and Quiz 5

Feasibility

Prospects

November 26th: Lecture 15

Ecological Resources

Economics and Ecology

Biodiversity

Preservation of species

November 28th: Lecture 16 and Quiz 6

Weitzman's cost effectiveness analysis

US Endangered Species Act

CITES

December 3rd: In-class review for second exam

December 5th: Second exam covers material since forestry economics