

Graduate Course Outline

**Department of Economics
School of Business and Economics**

**ECON 6010-3
Principles of Environmental Economics and Natural
Resource Economics (3,0,0)**

1. COURSE OVERVIEW

Calendar Description

Students are introduced to normative economics and receive a board overview of different approaches to economic analysis of the environment and resources. Environmental, ecological and resource problems are discussed and economic solutions are identified, analyzed and critiqued. Topics include an introduction to economic efficiency; externalities, common resources and public good provision issues; the theory of non-renewable natural resources; cost-benefit analysis; ecological economics and green accounting; and the economics of climate change.

Educational Objectives/Graduate-Level Learning Outcomes

After successfully completing the course, students will be able to:

1. Discuss natural resources, economy, scarcity and limits to growth.
2. Describe the normative criteria for decision making.
3. Analyze the theory of environmental externalities.
4. Identify the factors that influence the allocation of non-renewable resources over time.
5. Explain the problems associated with common resources.
6. Debate the solutions to common resource problems.
7. Demonstrate how to place a value on the environment.
8. Assess the importance of cost-benefit analysis.
9. Describe the differences between environmental and ecological economics.
10. Compute sustainable economic welfare using the genuine wealth concept.
11. Assess economic and ecological systems.
12. Critique the economics of climate change.

Course Topics

1. Changing Perspectives on the Environment
 - Economics and the environment
 - Traditional environmental economics and ecological approaches
 - Framework for understanding the ecological approach
 - Environmental microeconomics and macroeconomics
2. Review of Markets and Efficiency
 - Demand and supply concepts and the role of the market
 - Willingness to pay and to accept a payment concepts

- Producers and consumers surplus
 - Market efficiency
 - Measuring total welfare and change in welfare.
3. Theory of Environmental Externalities
 - External costs and benefits
 - Positive externalities
 - Welfare analysis of externalities
 - Property rights and Coase theorem
 - Limitations of Coase theorem
 4. Resource Allocation Over Time
 - Allocation of nonrenewable resources
 - Hotelling's rule and time discounting
 5. Common Property Resources
 - Common property, open access, and property rights
 - Application on fishery
 6. Public Goods Provision
 - Theory of public goods
 - Free riders and game theory
 - Environment as a public good
 - Global environment policy as a public good
 7. Valuing the Environment
 - Introduction to cost-benefit analysis
 - Brief description of techniques of valuation
 - Balancing the present and future: the discount rate
 - Social discount rate
 - Dealing with risk and uncertainty
 - Comparing cost and benefits
 8. Principles of Ecological Economics
 - Natural capital
 - Macroeconomics and ecology
 - Long-term sustainability and the Precautionary Principle
 9. National Income and Environmental Accounting
 - Greening the national income accounts
 - Applications of environmental and resource accounting
 - Measuring well-being: social and ecological dimensions
 10. Modeling Economic and Ecological Systems
 - Energy and resource flow analysis
 - Input-output analysis
 - Economic and ecological modeling
 11. Global Climate Change Issue
 - Causes and consequences of climate change
 - Economic analysis of climate change

12. Modeling Climate Change Impacts

- Climate change models
- Assessment of models
- Interpreting simulations results
- Weitzman's critic of integrated assessment models

Texts/Materials

Textbooks

Jonathan M. Harris, *Environmental And Natural Resource Economics, A Contemporary Approach*, Houghton Mifflin Company, 2006.

Other Resources

Tom Tietenberg and Lynne Lewis, *Environmental And Natural Resource Economics*, Pearson, Eight Edition, 2009.

Barry Field, *Natural Resource Economics, An Introduction*. Waveland Press, 2001.

Frank A. Ward, *Environmental And Natural Resource Economics*, Pearson Education Ltd., 2006.

Suggested Readings

Arrow et al., "Economic Growth, Carrying Capacity and the Environment," *Science*, 1995, Vol. 268, pp. 520-521.

Berck, P. and M. Roberts, "Natural Resource Prices Will They Ever Turn Up?" *Journal of Environmental Economics and Management* 31 (1996), pp. 65-78.

Clark, "The Economics of Overexploitation," *Science*, 1973, Vol. 181, pp. 630-634.

Costanza, "What is Ecological Economics?" *Ecological Economics*, 1989, Vol. 1, pp. 1-7.

Costanza and Daly, "Toward An Ecological Economics," *Ecological Modeling*, 1987, Vol. 38, pp. 1-7.

Darmstadter J. (2011) "Meeting the World's Natural Resource Needs: Confrontation (or Worse) Ahead?" *Resources for the Future*, Issue Brief 11-07, June 2011.

de Bruyn, van der Bergh and Opschoor, "Economic Growth and Emissions: Reconsidering the Empirical Basis of Environmental Kuznet's Curves," *Ecological Economics*, 1998, Vol. 25, pp. 161-175.

Ecosystems and Human Well Being Summary, Millennium Ecosystem Assessment.

Edwards-Jones, Davies and Hussain, "A Brief History of Ecological Economic Thought," *Ecological Economics: An Introduction*, 2000, Blackwell Science, pp. 10-29.

Frederick, S., G. Loewenstein and T. O'Donoghue, "Time Discounting and Time Preference: A Critical Review" *Journal of Economic Literature* 40 (2002), pp. 351-401.

Gordon, "The Economic Theory of a Common Property Resource: The Fishery," *Journal of Political Economy*, 1954, Vol. 62, pp. 124-142.

Grossman and Krueger, "Economic Growth and the Environment" Quarterly Journal of Economics, 1995, Vol. 110, pp. 353-377.

Hanson, D. A., "Increasing Extraction Costs and Resource Prices: Some Further Evidence" Bell Journal of Economics 11 (1980), pp. 335-342.

Hardin, Garrett (1968), "The Tragedy of the Commons," Science (162): pp. 1243-1248.

Hartwick, "Intergenerational Equity and the Investing of Rents from Exhaustible Resources," American Economic Review, 1977, vol. 67, pp. 972-974.

Hepburn C. (2009) "Ethics and Discounting Global Warming Damages," Weekly Policy Commentary, Resources for the Future, October 20.

Pearce, D., B. Groom, C. Hepburn, and P. Koundouri (2003) "Valuing the Future: Recent Advances in Social Discounting" World Economics, 4(2): pp. 121-41.

Simpson, Toman and Ayres (2004) "Scarcity and Growth in the New Millenium: Summary," Discussion Paper 04-01, Resources for the Future, January 2004.

Shafik, "Economic Development and Environmental Quality: An Econometric Analysis", Oxford Economic Papers, 1994, vol. 46, pp. 757-773.

Solow, R. (1991) "Sustainability: An Economist's Perspective" in Dorfman, R. and N. Dorfman, Eds. Economics of the Environment: Selected Readings 3rd ed. Norton, pp. 179-187.

Solow, R. (1974) "The Economics of Resources or the Resources of Economics" in R. Dorfman and N. Dorfman eds. Economics of the Environment: Selected Readings 3rd ed. Norton, pp. 162-178.

Tietenberg, "Sustainable Development: Defining the Concept," Environmental and Natural Resource Economics, 6th Edition, 2003, Addison-Wesley, pp. 88-101.

Tsur, Y. and A. Zemel, "Scarcity, Growth and R&D" Journal of Environmental Economics and Management 49 (2005), pp. 484-499.

Student Evaluation Philosophy and Methods

Face-to-Face

Poster Presentation	20%
Online Discussions	10%
Assignments	10%
Mid-term Exam	25%
Final Exam	35%

Online

Assignments	40%
On-line Discussions	15%
Final Exam	45%

Poster Presentation

Students will be required to prepare and present a poster on a particular environmental, resource or ecological issue to the community. The poster will be completed in a team. A grade of zero will be given for all late assignments unless permission is received in advanced.

On-line Discussion

Six discussion questions will be posted for comment by students at different times throughout the course.

Discussion 1 – Are there limits to growth?

Discussion 2 – Does government intervention help in correcting market failures?

Discussion 3 – Do we always observe the tragedy of the commons?

Discussion 4 – How can we stop people from free riding?

Discussion 5 – Ecological economics and green accounting: Should we use these concepts?

Discussion 6 – Should we act or wait on climate change?

Students are expected to engage in an active debate with each other of the issues involved. Discussions will be monitored to ensure it remains focused on the question asked and that all students are respectful of each other and engaged. An online discussion grade will be assigned at the end of each discussion based on the quality and not the quantity of each student's contributions.

Assignments

Four assignments each worth 5% will be given during the semester. Assignments will be solving problems that will prepare them for the exams.

Mid-term Exam

There will be a mid-term exam after Topic 5. Translators or other electronic devices are not permitted during exams with the exception of a scientific calculator.

Final Exam

The comprehensive final exam is three hours in length. Translators or other electronic devices are not permitted during exams with the exception of a scientific calculator.

2. RELATIONSHIP TO OTHER COURSES

Prerequisites

Admission to the MScESM program

Co-requisites

None

Links to Previous, Concurrent and Subsequent courses

This course covers a board range of sustainable economic management topics from a theoretical perspective. Students will get a board picture of all positive and normative areas and in the subsequent courses will conduct a more in depth analysis.

3. COURSE PURPOSE AND FIT IN GRADUATE PROGRAM

What is this course's role in the graduate program?

This is the introductory course for the MScESM. Students explore principles such as economic efficiency, problems with markets in allocating scarce resources, open access resources and public good provision, the management of renewable and non-renewable resources as well as ecological economics and environmental accounting. It gives the student a snapshot of what the remaining core courses in the program contain.

4. DELIVERY

Delivery mode (face-to-face, blended, distance)

The course will be developed for distance, blended, and campus delivery.

Delivery Features

- Lectures recorded using Camtasia
- Group work
- Online discussions

Instructional Approach

This course employs an active, collaborative learning approach with a heavy reliance on group problem solving, academic research and online discussion or class participation.

5. OTHER

Methods for Prior Learning Assessment and Recognition

PLAR is not allowed in graduate programs under Northwest Commission on Colleges and Universities (NWCCU) accreditation standards. No PLAR credit will be awarded, which is permissible under TRU policy.

Course Policies

Academic Integrity – In accordance with TRU Policy 5-0.

Examinations – In accordance with TRU Policy ED 3-9. In addition, students must pass the final exam to receive a passing grade for the course.

Grading – In accordance with TRU Policy ED 3-5.

Late Assignments - A grade of zero will be given for all late assignments unless permission is received in advanced from the instructor/facilitator.

Student Academic Appeals - In accordance with TRU Policy ED 4-0.

Student Attendance – In accordance with ED 3-1.

Team Conflict - All team members should actively participate in the analysis of the case and the preparation of the report and act professionally towards each other. During the course, if a student feels this is not occurring, they should bring this matter to the attention of the facilitator immediately so they can investigate the conflict and take the appropriate action including assigning students a failing grade for the course. Working effectively in teams and acting professionally towards one's colleagues is a major learning goal of an MBA program. Students should be careful to ensure their behaviour does not become an issue.

Withdrawals – In accordance with ED 3-0.