

Macquarie University

Division of Economic and Financial Studies

Econ 359 Environmental Economics

Semester 2, 2007

Lecturer-in-charge: Dr. Tihomir Ancev (9427 0072; 9351 6931)
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Lecture time / room: Wednesday 1.05 p.m. – 2.55 p.m. E5A 118
Tutorial times / rooms Wednesday 4.05 p.m. – 4.55 p.m. X5B 132
and if necessary Wednesday 5.05 p.m. – 5.55 p.m. X5B 136

Introduction to the course

Welcome to Environmental Economics (ECON 359). ECON 359 is based on the mainstream economic approach towards the environment and natural resources. Throughout the course we will investigate various economic aspects of a range of environmental issues. Case studies will be drawn from Australian and international experience. The guiding economic themes will be competing uses of the environment / externalities, market failure, the importance of property rights, optimal allocation of pollution abatement, technical issues in non-market valuation methods (measuring benefits without commodities), and the processes for making choices relating to non-market goods. Some social issues with environmental impacts are studied through exploration of the problems of population size and distribution, economic growth, and environmental regulation. In addition, the main economic theories about the optimal use of renewable resources (forests, fisheries, water) and non-renewable resources (minerals, oil) will be studied.

Prerequisites and Assumed knowledge:

ECON 200 Intermediate Microeconomics. It is assumed that students are familiar with both unconstrained and constrained optimisation techniques (static and dynamic) and integral calculus.

Textbooks

The main text used in the course is:

Tietenberg, T. (2006), *Environmental and Natural Resource Economics* (7th ed.). Pearson Education.

Other Main References are:

Perman, R., Ma, Y., McGilvray, J., and M.Common, (2003), *Natural Resource and Environmental Economics*, 3rd edition, Addison Wesley, New York.

John M. Hartwick and Nancy D. Olewiler. (1998), *The Economics of Natural Resource Use*, 2nd Ed. Addison-Wesley.

Charles D. Kolstad. (2000) *Environmental Economics*, Oxford University Press,

Hanley, N., Shogren, J.F., and B.White, (2001) *Introduction to Environmental Economics*, Oxford University Press, Oxford.

Ward, F., A. (2006) *Environmental and Natural Resource Economics*, Pearson Education.

Additional readings: For most topics discussed in lectures and for the tutorials, there will be additional readings assigned in a form of journal articles posted on the WebCT.

Course objectives:

1. Enable students to identify the economic aspect of an environmental problem when confronted with one.
2. Enable students to choose an appropriate theoretical framework for an analysis of the encountered environmental economic problem.
3. Enable students to thoroughly understand, evaluate and interpret the key economic theories that deal with extraction of non-renewable resources, and the use of renewable resources.
4. Enable students to choose and conduct an appropriate empirical analysis of the encountered environmental economics / natural resource problem.
5. Enable students to understand the role of economists in the environmental and natural resource policy design and implementation, and to formulate and communicate a sound policy advice.

Course outcomes

After successful completion of the course, students should be able to do the following:

1. Identify economic issues related to a given environmental problem, identify key stakeholders, key economic conflicts and determine the institutional setting under which the possible solutions to the problem might be supported.
2. Theoretical conceptualization of environmental economic problems. Use and refine main economic theoretical concepts in formulation of problems related to renewable and non-renewable resource use.

3. Use environmental economic methods (optimization, econometrics, valuation of environmental goods, etc.), and methods of natural resource economics (dynamic constrained optimisation, optimal control). Demonstrate knowledge of the data needs for a meaningful environmental economic/natural resource economic analysis, and identify potential data sources and methods for collecting data.
4. Determine, formulate and communicate policy implications from a conducted research study in the area of environmental/natural resource economics.

WebCT

This course will have a WebCT site. Students will have automatic access to this site by logging to WebCT. The WebCT site will be used as a repository of class material (lecture notes, reading assignments, etc.), as a communication tool (discussions, e-mails, marks), and as a general student resource (access to this Handbook, Library links, etc.).

Course Outline

Lectures

There will be 12 two-hour lecture sessions starting on Wednesday, 1 August and a final revision session. For each lecture there will be one or more corresponding chapters from the main textbook for the course (Tietenberg, 7th ed.).

Tutorials

There will be five tutorial sessions plus a revision session in the lecture period in week 13 of the semester. The schedule for the tutorials will be negotiated with the students and the final timetable will be announced through the WebCT. Tutorial material will be posted on the WebCT prior to the tutorial sessions.

Tentative weekly schedule

Week 1. Introduction and Overview

Visions for the Future (Ch.1 Tietenberg); Valuing the Environment: Concepts (Ch.2 Tietenberg)

Week 2. Building blocks

Valuing the Environment: Methods (Ch.3 Tietenberg); Property rights, Externalities and Environmental Problems (Ch.4 Tietenberg)

Week 3. Problem of overpopulation and sustainable development.

Sustainable Development (Ch. 5 Tietenberg); The Population Problem (Ch.6 Tietenberg)

Week 4. Economics of pollution control. Instruments of Environmental Policy.

Economics of Pollution control: An overview (Ch. 15 Tietenberg)

Week 5. Spatial dimensions of pollution.

Stationary Source local air pollution (Ch. 16 Tietenberg); Regional and Global Air Pollutants (Ch. 17 Tietenberg)

Week 6. Economics of Water pollution (Ch. 19 Tietenberg)

Week 7. Economics of toxic substances, stock pollution and cleanup of hazardous waste sites. Economics of household waste and recycling.

Toxic Substances (Ch. 20 Tietenberg). Recyclable Resources (Ch. 9 Tietenberg).

Week 8. Introduction to Natural Resource Economics and Generalised Resource Scarcity

The allocation of Depletable and Renewable Resources: An overview (Ch. 7 Tietenberg).
Generalised resource scarcity (Ch.14 Tietenberg)

Week 9. Economics of non-renewable resources and their optimal extraction

(Ch 8 and Ch. 9 Tietenberg)

Week 10. Economics of water use and agriculture

(Ch.10 and Ch. 11 Tietenberg)

Week 11. Economics of renewable resources: Forestry and Fisheries

(Ch. 12 and Ch. 13 Tietenberg)

Week 12. Economic development, poverty and the environment

(Ch. 22, Ch. 23 and Ch. 24 Tietenberg)

Course Assessment

The course assessment will be based on:

- Mid-term exam (40 marks)
- End of term exam (60 marks)

To pass the course, students must achieve 50 marks or more out of 100 for the whole course.

The mid-term exam will be one and a half hour and will cover the material discussed thus far. A tentative date for the exam is 12 September.

The final exam will be three hours and *cover the whole course*. The exam will be scheduled by the examination office.

The format of both exams will be as follows: short answer section (8 questions) worth 32%. The rest will be distributed between 2-3 essay type questions (30-48%) and 1-2 problem type questions (20-30%).

Not attending the exams will have to be substantiated with special consideration form (medical certificate).

Other Readings

ABARE. (2001), *Alternative Policy Approaches to Natural Resource Management*, Available for free download from ABARE web-site.

Aplin, G. (1998), *Australians and Their Environment*, Oxford University Press, Melbourne.

Anderson, L.G. (1986), *The Economics of Fisheries Management*, Rev edn, Johns Hopkins Press, Baltimore.

Barbier, E.B. (1989), *Economics, Natural-Resource Scarcity and Development: Conventional and Alternative Views*, Earthscan Publications, London.

Baumol, W.J. and Oates, W.E. (1988), *The Theory of Environmental Policy*, Cambridge, Cambridge University press.

- Boadway, R. and Bruce, N. (1984), *Welfare Economics*, Basil Blackwell, Oxford.
- Bohm, P. (1987), *Social Efficiency: A Concise Introduction to Welfare Economics*, 2nd edn, Macmillan, London.
- Common, M. (1996), *Environmental and Resource Economics. An Introduction*, 2nd edn, Longman, Harrow.
- Conrad, J.M. (1999), *Resource Economics*, Cambridge University Press, Cambridge.
- Conrad, J.M. and Clark, C.W. (1987), *Natural Resource Economics: Notes and Problems*, Cambridge University Press, Cambridge. This offers a more sophisticated mathematical approach.
- Cornes, R. and Sandler, T. (1996), *The Theory of Externalities, Public Goods and Club Goods*, 2nd edn, Cambridge University press, Cambridge.
- Dasgupta, P (1982), *The Control of Resources*, Basil Blackwell, Oxford.
- Fisher, A.C. (1981), *Resource and Environmental Economics*, Cambridge University Press, Cambridge.
- Freeman A.M.III, (1993), *The Measurement of Environmental and Resource Values, Theory and Methods*, Resources for the Future, Washington D.C.
- Goodstein, E. (1995), *Economics and the Environment*, Prentice-Hall, Englewood Cliffs.
- Grafton, Adamowics, Dupont, Nelson, Hill and Renzetti. (2004) *The Economics of the Environment and Natural Resources*. Blackwell Publishing.
- Herendeen, R.A. (1998), *Ecological Numeracy: Quantitative Analysis of Environmental Issues*, John Wiley & Sons, New York,
- Hussen, A.M. (2000), *Principles of Environmental Economics*, London, Routledge.
- Iudicello, S., Weber, M. and Wieland, R. (1999), *Fish, Markets, and Fishermen: The Economics of Overfishing*, Island Press, Washington, D.C.
- Kneese, A.V. and Sweeney, J.L. (eds), *Handbook of Natural Resource and Energy Economics*, Vols. I and II, Elsevier Science, Amsterdam.
- Lomberg, B., 2001, *The Skeptical Environmentalist: Measuring the Real State of the World*, Cambridge University Press.
- Moran, A., Chisholm, A. and Porter, M. (eds.) (1991), *Markets, Resources and the Environment*, Allen and Unwin, North Sydney.
- Pearce, D.W. and Turner, R.K. (1990), *Economics of Natural Resources and the Environment*, Harvester Wheatsheaf, New York.
- Pearce, D.W. and J.Warford, 1993, *World Without End, Economics, Environment and Sustainable Development*, Oxford University Press, Oxford.
- Randall, A. (1987), *Resource Economics: an Economic Approach to Natural Resource and Environmental Policy*, 2nd edn, John Wiley & Sons, New York.

Thampapillai, D. (2002), *Environmental Economics*, Oxford University Press, Oxford.

Turner, R.K., Pearce, D. and Bateman, I. (1994), *Environmental Economics: An Elementary Introduction*, Johns Hopkins

Some Journals where texts on Environmental Economics are often published

Australian

Australian Economic Papers

Australian Forestry

Australian Journal of Agricultural and Resource Economics

Australian Journal of Environmental Management

Economic Record

International

American Journal of Agricultural Economics

Ecological Economics

Environment and Development Economics

Environment and Planning

Environmental and Resource Economics

Environmental Conservation

Energy Journal

Energy Policy

Journal of Agricultural and Resource Economics

Journal of Environmental Economics and Management

Journal of Environmental Management

Land Economics

Natural Resources Journal

Natural Resources Modeling

Resource and Energy Economics

Review of Agricultural Economics

Some Useful World Wide Web Sites

<http://www.aere.org> (Association of Environmental and Resource Economists (AERE))

<http://www.ea.gov.au> - Environment Australia

<http://www.abare.gov.au> - Australian Bureau of Agricultural and Resource Economics

<http://www.epa.gov/ebtpages/economics.html> -US EPA , Economics Unit

<http://www.vwl.uni-mannheim.de/conrad/eaere/> (European Association of Environmental and Resource Economists (EAERE))

<http://www.oecd.org> - OECD, several of the Directorates deal with Environmental Econ.

And many, many more.....