

MACQUARIE
UNIVERSITY



FACULTY OF
BUSINESS AND ECONOMICS

ECON359 Environmental Economics

Semester 2, 2009

Department of Economics

Welcome to Environmental Economics (ECON359). ECON359 is based around the mainstream economic approach towards the environment and natural resources, but also incorporates perspectives from ecological economics. 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. The importance of thresholds and constraints arising out of systemic ecological structures and the nature of physical reality will be emphasised where relevant. By way of a capstone topic the course will conclude with an examination of the *ne plus ultra* of environmental economics issues: climate change.

You should read this unit outline carefully at the start of semester. It contains important information about the unit. If anything in it is unclear, please consult the unit convenor.

This unit is worth 3 credit points: each credit point assumes 2-3 hours private study in addition to class attendance. This unit covers the major developments in economic analysis since the eighteenth century and before. The main emphasis is on tracing the historical evolution of modern economic theories, but the philosophical and socio-economic factors which have influenced the development of economic ideas are also given importance.

My aims in this unit are to:

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 sound policy advice.

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.

TEACHING STAFF

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Office hours: Tuesday 10-12, Thursday 10-12

CLASSES

1 x 2 hour lecture per week, for 13 weeks and 1 x 1 hour tutorial p.w. for 8 weeks. Lectures are 9 am to 11 am on Wednesdays in E4B 314. Tutorials are at 12 pm and 1pm on Wednesdays in E8A 118 in weeks 4-7, 9, 11-13. Lectures will be recorded using the iLecture system and made available for download via the unit's WebCT page.

ASSESSMENT

Your performance in the course will be assessed as follows:

| | |
|---|-----|
| Class test 1 (Multiple Choice, Week 7): | 20% |
| Class test 2 (Short Answer, Week 11): | 20% |
| Final Exam (Long Answer): | 60% |

You should be aware that it is Economics Department policy that passing the final exam is a necessary condition for passing a course. Failure in the final exam will mean failure in ECON359, accumulated marks in the within-semester tests notwithstanding.

Textbooks

The prescribed text for the course is:

Grafton, R. Quentin, Adamowicz, W., DuPont, D., Nelson, H., Hill, R.J. & Renzetti, S. *Economics of the Environment and Natural Resources* (Blackwell, 2004).

This text combines a direct and intuitive approach to theoretical issues with an appropriate degree of rigour. You should note that while the discussion of the techniques (principally dynamic optimisation in both present and current value forms) will play a role in the lecture material, you will not be asked (nor assessed on your ability) to apply the techniques in a problem-solving context. You will be expected to understand how the solutions to the dynamic optimisation problems translate into policy responses and judgements about welfare.

Environmental economics has grown into a large and varied literature so there is no shortage of additional resources to draw upon should you so choose (N.B. intellectual monocultures lack resilience in the same way that ecological ones do...☺!) The following is a non-exhaustive sampling:

Texts

Tietenberg, T., *Environmental and Natural Resource Economics* (various eds.).

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.

Other books

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.

Ludicello, 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.....

PLAGIARISM

The University defines plagiarism in its rules: 'Plagiarism involves using the work of another person and presenting it as one's own.' Plagiarism is a serious breach of the University's rules and carries significant penalties. You must read the University's practices and procedures on plagiarism. These can be found in the *Handbook of Undergraduate Studies* or on the web at: <http://www.student.mq.edu.au/plagiarism/>

The policies and procedures explain what plagiarism is, how to avoid it, the procedures that will be taken in cases of suspected plagiarism, and the penalties if you are found guilty. Penalties may include a deduction of marks, failure in the unit, and/or referral to the University Discipline Committee.

UNIVERSITY POLICY ON GRADING

The Academic Senate has a set of guidelines on the distribution of grades across the range from fail to high distinction. Your final result will include one of these grades plus a standardised numerical grade (SNG). On occasion your raw mark for a unit (i.e. the total of your marks for each assessment item) may not be the same as the SNG which you receive. Under the Senate guidelines, results may be scaled to ensure that there is a degree of comparability across the university, so that units with the same past performances of their students should receive similar results.

It is important that you realize that the policy does not require that a minimum of students be failed in any unit. In fact it does something like the opposite, in requiring examiners to explain unusually high failure rates in a unit.

The process of scaling does not change the order of marks among students. A student who receives a higher raw mark than another will also receive a higher final scaled mark. The only exception to this rule occurs in those cases in which failure is directly due to failure in the final exam (see 'Assessment' above). In these cases the SNG will be in the fail range even though the 'raw' aggregate mark is not.

For an explanation of the policy see

<http://www.mq.edu.au/senate/MQUonly/Issues/Guidelines2003.doc> or

<http://www.mq.edu.au/senate/MQUonly/Issues/detailguidelines.doc>.

STUDENT SUPPORT SERVICES

Macquarie University provides a range of Academic Student Support Services. Details of these services can be accessed at <http://www.student.mq.edu.au>.

You may also seek help from BESS (Business and Economics Student Services) located in E4B.

FINAL EXAM ARRANGEMENTS

You are expected to present yourself for examination at the time and place designated in the University Examination Timetable. The timetable will be available in Draft form approximately eight weeks before the commencement of the examinations and in Final form approximately four weeks before the commencement of the examinations.

<http://www.timetables.mq.edu.au/exam>

The only exception to not sitting an examination at the designated time is because of documented illness or unavoidable disruption. In these circumstances you may wish to consider applying for Special Consideration. Information about unavoidable disruption and the special consideration process is available at <http://www.reg.mq.edu.au/Forms/APSCon.pdf>

All claims have to be substantiated by a signed **Professional Authority Form**, and if they are based on non-medical grounds, supporting documentation (such as statutory declarations by independent witnesses, police reports, or statements from sufficiently senior officials in the place of employment) must also be provided. If accepted, in most cases, the students will be required to sit a supplementary examination on a date set by the Faculty. So, students who intend to be away must take account of this rule in scheduling any travel after lodging the request.

Please note carefully that special consideration and supplementary examination are not automatic entitlements. In particular, applications will only be considered in cases where the applicant's within-semester work has been of a satisfactory standard (i.e. an overall pass in within-semester assessment).

UNIT CALENDAR

| Week | Date | Lecture (text chapter) | Tutorial |
|------|--------|--|--------------------------|
| 1 | 5 Aug | Introduction and overview (1) | |
| 2 | 12 Aug | Non-renewable resources (7) | |
| 3 | 19 Aug | Fishery economics (4) | |
| 4 | 26 Aug | Forestry economics (5) | Intro/Non-renewables |
| 5 | 2 Sep | Water economics (6) | Fisheries/Forests |
| 6 | 9 Sep | Pollution control (3) | Water/Pollution |
| 7 | 16 Sep | Property rights (2) | Class test 1 (MC) |
| | | Mid-semester break | |
| 8 | 7 Oct | Property rights (2) | |
| 9 | 14 Oct | Environmental valuation (8-10) | Property rights |
| 10 | 21 Oct | Environmental valuation (8-10) | |
| 11 | 28 Oct | Environmental accounting and measurement issues (12) | Class test 2 (SA) |
| 12 | 4 Nov | Climate change (11, 14) | Valuation |
| 13 | 11 Nov | Climate change (11,14) | Climate change |

Exam period **18 Nov - 4 Dec**