



# ENVS201

## Introduction to Environmental Economics

S1 Day 2016

*Dept of Environmental Sciences*

### Contents

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<a href="#"><u>General Information</u></a>	2
<a href="#"><u>Learning Outcomes</u></a>	2
<a href="#"><u>General Assessment Information</u></a>	3
<a href="#"><u>Assessment Tasks</u></a>	3
<a href="#"><u>Delivery and Resources</u></a>	7
<a href="#"><u>Unit Schedule</u></a>	7
<a href="#"><u>Learning and Teaching Activities</u></a>	9
<a href="#"><u>Policies and Procedures</u></a>	9
<a href="#"><u>Graduate Capabilities</u></a>	11

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#### **Disclaimer**

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## General Information

Unit convenor and teaching staff

Instructor

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By appointment

Credit points

3

Prerequisites

12cp

Corequisites

Co-badged status

Unit description

This unit is designed to provide students with an introductory exposure to environmental economics. In addition to dwelling on the key concepts, tools and methods used in environmental economics, the unit provides an understanding as to why it is crucial to incorporate the environment as a factor of production in our economy, what the key challenges are in doing so and how effective the available policy instruments are. Several topics such as the economics of climate change, economics of land use development and urban planning, and sustainable development will be covered in order to highlight the role environmental economics plays in addressing contemporary societal challenges. The emphasis of this unit is also on helping students develop a set of basic analytical and mathematical tools that could be used to assess and derive practical policy recommendations. The unit builds on several real case studies that provide students with a hands-on introduction to basic cost-benefit analysis (using Excel) involving future discounting and uncertainty.

## Important Academic Dates

Information about important academic dates including deadlines for withdrawing from units are available at <https://www.mq.edu.au/study/calendar-of-dates>

## Learning Outcomes

On successful completion of this unit, you will be able to:

An ability to do basic cost-benefit analysis of environmental policies and outcomes --

through the use of numerical examples. No prior exposure to economics is assumed.

An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.

An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)-- explained through real life examples in environment, society and policy

An ability to comprehend and relate the environmental and economic consequences of land development, transport, infrastructure and urban growth--develops and augments urban and urban planning skills in the context of climate change, natural resource scarcity and budget constraints

A brief understanding of the political economy of government interventions with respect to urbanization and the environment--helps develop skills relating to policy formulation and analysis

An ability to consider environmental policy issues from an economic perspective; ability to objectively analyze economic, environmental and socio-political tradeoffs associated with environmental problems such as global warming--accomplished through consideration of contemporary societal challenges

Understanding of the linkages between physical science and economics as well as the basic capability to integrate the two --explained through existing socio-economic-climatic models

## General Assessment Information

First assignment task is to be completed individually, no collaboration is permitted (unless otherwise instructed by the teacher). Second assignment task must be completed in groups.

Mid-term and final exams are closed book exams and need to be taken during the scheduled weeks (unless exceptions have been permitted).

## Assessment Tasks

Name	Weighting	Due
<a href="#"><u>Assignment 1</u></a>	15%	March 15
<a href="#"><u>Mid-Term Exam</u></a>	35%	April 5
<a href="#"><u>Assignment 2</u></a>	15%	May 31
<a href="#"><u>Final Exam</u></a>	35%	June 7

## Assignment 1

Due: **March 15**

Weighting: **15%**

The First assignment involves cost-benefit/wtp analysis (15 marks out of 100)--This assignment is given after the first (or second) lecture when students are made familiar with CBA and willingness to pay (wtp) techniques.

A hard of the assignment needs to be submitted in class on the due date. An electronic copy detailing all calculations, must be submitted by email by the due date.

On successful completion you will be able to:

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.
- An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)-- explained through real life examples in environment, society and policy
- An ability to consider environmental policy issues from an economic perspective; ability to objectively analyze economic, environmental and socio-political tradeoffs associated with environmental problems such as global warming--accomplished through consideration of contemporary societal challenges

## Mid-Term Exam

Due: **April 5**

Weighting: **35%**

Exam topics cover course material up to lectures 1-5.

This is a closed book exam. Maximum time allowed will be 90 minutes.

On successful completion you will be able to:

- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.
- An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)--

explained through real life examples in environment, society and policy

- An ability to comprehend and relate the environmental and economic consequences of land development, transport, infrastructure and urban growth--develops and augments urban and urban planning skills in the context of climate change, natural resource scarcity and budget constraints
- A brief understanding of the political economy of government interventions with respect to urbanization and the environment--helps develop skills relating to policy formulation and analysis
- An ability to consider environmental policy issues from an economic perspective; ability to objectively analyze economic, environmental and socio-political tradeoffs associated with environmental problems such as global warming--accomplished through consideration of contemporary societal challenges
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## Assignment 2

Due: **May 31**

Weighting: **15%**

The second assignment has two parts: first part-- project report preparation (10 marks out of 100) and second part-- presentation (5 marks out of 100)--This assignment is handed out in the post-mid term session and students normally have 3-4 weeks to work on the report.

A hard copy of the project report will be due in class (an electronic copy must be submitted by email as well).

The report must not exceed 2 pages in length (single spaced and 12 font size). References will not count towards the page limit.

Additional rules over how to allocate individual contributions on the project within the group and details over topics to be worked on will be provided on iLearn.

Each student within a group must present a part of the project findings.

Presentations are due in class.

On successful completion you will be able to:

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and

policy contexts.

- An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)--explained through real life examples in environment, society and policy
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## Final Exam

Due: **June 7**

Weighting: **35%**

Mostly covers post-mid term course materials. May cover one or two topics from the pre-mid term.

This is a closed book exam, maximum time allowed will be 100 minutes.

On successful completion you will be able to:

- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.
- An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)--explained through real life examples in environment, society and policy
- An ability to comprehend and relate the environmental and economic consequences of land development, transport, infrastructure and urban growth--develops and augments urban and urban planning skills in the context of climate change, natural resource

scarcity and budget constraints

- A brief understanding of the political economy of government interventions with respect to urbanization and the environment--helps develop skills relating to policy formulation and analysis
- An ability to consider environmental policy issues from an economic perspective; ability to objectively analyze economic, environmental and socio-political tradeoffs associated with environmental problems such as global warming--accomplished through consideration of contemporary societal challenges
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## Delivery and Resources

Reading materials including lecture notes are provided on iLearn. Handouts are provided during the lectures.

Note: iLectures are not recorded for this course and students are required to attend ALL lectures, as most of the learning takes through classroom interactions.

Technology used: iLearn, computers for performing excel examples, MS office software, etc

## Unit Schedule

Unit Schedule

Please refer to MQ timetable for teaching dates and location

Students may find the below book (available in the MQ library) useful for an introduction to environmental economics--

**Environmental Economics: An Introduction (Mcgraw-Hill) by Barry Field and Martha Field**

However, this is NOT a required reading.

**Also refer to Environmental and Natural Resource Economics, 10/e, by Tietenberg and Lewis**

(This is tentative schedule of topics as some topics may require more than a week to cover)

Week 1--Introduction to basic microeconomics.

Economy and the Environment: Production Function, GDP and Sustainability

Green Accounting: The case for counting environmental degradation as capital depreciation

Case Study: Are we being served, Economist article

Week 2---Environmental Challenges: Market Failure, Externalities, Property Rights

Case Study: Paul Krugman: California Death Spiral

Week 3---Valuing the Environment, CBA, value of water

Case Study: Valuing Biodiversity By Partha Dasgupta

Week 4---Industry production and pollution abatement costs; Health impacts of industrial/ environmental pollution, Environmental Kuznets Curve

Case Study: The Economics of Pollution Control, by Daniel Phaneuf

Week 5---Policy Instruments: Taxes/Quotas, Subsidies and Regulations: Controlling point and non-point sources of pollution

Case Study TBA

Week 6---Mid Term Exam

Week 7---The Economics of Climate Change: Environmental damages and cost benefit accounting.

Case Study TBA

Understanding and managing catastrophic possibilities: Risks: objective versus subjective risks, mitigation versus adaptation tradeoffs, role of risk perception in decision making

Case Study TBA

Week 8---Urban Growth and the Environment: The political economy of urbanization, role of property taxes, environmental impacts

Case Study TBA

Week 9---Economics of Transport/Infrastructure: Sustainable options, renewable and non-renewable resources, Fuel Efficiency and Rebound effect

Case Study TBA



Week 10---Economics of Land use Planning: Urban sprawl, land use and water scarcity—agriculture versus urbanization

Week 11 ---Urbanization, energy dependence and health impacts of urban sprawl

Economics of renewable and non-Renewable Resources: Fisheries/Oil

Case Study TBA

Week 12-- Presentations

Week 13---Final Exam

## **Learning and Teaching Activities**

### Tutorials

Tutorials will be conducted during regular teaching hours.

### Class room lectures

These are main lecture sessions conducted once per week.

### Class presentations

This will be held as a part of the second assignment

### Project report preparation

This is normally done in small groups. Some time will be allocated during the post-break sessions for students to work on the projects in class. However, a majority of this task needs to be completed outside the classroom.

### Practice questions

Are handed out regularly in class

### Class Discussions on Handouts

Happens during weekly lectures

## **Policies and Procedures**

Macquarie University policies and procedures are accessible from [Policy Central](#). Students should be aware of the following policies in particular with regard to Learning and Teaching:

Academic Honesty Policy [http://mq.edu.au/policy/docs/academic\\_honesty/policy.html](http://mq.edu.au/policy/docs/academic_honesty/policy.html)

**New Assessment Policy in effect from Session 2 2016** [http://mq.edu.au/policy/docs/assessment/policy\\_2016.html](http://mq.edu.au/policy/docs/assessment/policy_2016.html). For more information visit [http://students.mq.edu.au/events/2016/07/19/new\\_assessment\\_policy\\_in\\_place\\_from\\_session\\_2/](http://students.mq.edu.au/events/2016/07/19/new_assessment_policy_in_place_from_session_2/)

Assessment Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy prior to Session 2 2016 <http://mq.edu.au/policy/docs/grading/policy.html>

Grade Appeal Policy <http://mq.edu.au/policy/docs/gradeappeal/policy.html>

Complaint Management Procedure for Students and Members of the Public [http://www.mq.edu.au/policy/docs/complaint\\_management/procedure.html](http://www.mq.edu.au/policy/docs/complaint_management/procedure.html)

Disruption to Studies Policy [http://www.mq.edu.au/policy/docs/disruption\\_studies/policy.html](http://www.mq.edu.au/policy/docs/disruption_studies/policy.html) *The Disruption to Studies Policy is effective from March 3 2014 and replaces the Special Consideration Policy.*

In addition, a number of other policies can be found in the [Learning and Teaching Category](#) of Policy Central.

## Student Code of Conduct

Macquarie University students have a responsibility to be familiar with the Student Code of Conduct: [https://students.mq.edu.au/support/student\\_conduct/](https://students.mq.edu.au/support/student_conduct/)

## Results

Results shown in *iLearn*, or released directly by your Unit Convenor, are not confirmed as they are subject to final approval by the University. Once approved, final results will be sent to your student email address and will be made available in [eStudent](#). For more information visit [ask.mq.edu.au](http://ask.mq.edu.au).

## Student Support

Macquarie University provides a range of support services for students. For details, visit <http://students.mq.edu.au/support/>

## Learning Skills

Learning Skills ([mq.edu.au/learningskills](http://mq.edu.au/learningskills)) provides academic writing resources and study strategies to improve your marks and take control of your study.

- [Workshops](#)
- [StudyWise](#)
- [Academic Integrity Module for Students](#)
- [Ask a Learning Adviser](#)

## Student Services and Support

Students with a disability are encouraged to contact the [Disability Service](#) who can provide appropriate help with any issues that arise during their studies.

## Student Enquiries

For all student enquiries, visit Student Connect at [ask.mq.edu.au](http://ask.mq.edu.au)

## IT Help

For help with University computer systems and technology, visit [http://www.mq.edu.au/about\\_us/offices\\_and\\_units/information\\_technology/help/](http://www.mq.edu.au/about_us/offices_and_units/information_technology/help/).

When using the University's IT, you must adhere to the [Acceptable Use of IT Resources Policy](#). The policy applies to all who connect to the MQ network including students.

## Graduate Capabilities

### Creative and Innovative

Our graduates will also be capable of creative thinking and of creating knowledge. They will be imaginative and open to experience and capable of innovation at work and in the community. We want them to be engaged in applying their critical, creative thinking.

This graduate capability is supported by:

### Learning outcomes

- An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)-- explained through real life examples in environment, society and policy
- An ability to consider environmental policy issues from an economic perspective; ability to objectively analyze economic, environmental and socio-political tradeoffs associated with environmental problems such as global warming--accomplished through consideration of contemporary societal challenges

### Assessment tasks

- Mid-Term Exam
- Assignment 2

### Learning and teaching activities

- Tutorials will be conducted during regular teaching hours.
- These are main lecture sessions conducted once per week.
- This will be held as a part of the second assignment
- This is normally done in small groups. Some time will be allocated during the post-break sessions for students to work on the projects in class. However, a majority of this task needs to be completed outside the classroom.
- Happens during weekly lectures

## Capable of Professional and Personal Judgement and Initiative

We want our graduates to have emotional intelligence and sound interpersonal skills and to demonstrate discernment and common sense in their professional and personal judgement. They will exercise initiative as needed. They will be capable of risk assessment, and be able to handle ambiguity and complexity, enabling them to be adaptable in diverse and changing environments.

This graduate capability is supported by:

### Learning outcomes

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.
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## Commitment to Continuous Learning

Our graduates will have enquiring minds and a literate curiosity which will lead them to pursue knowledge for its own sake. They will continue to pursue learning in their careers and as they participate in the world. They will be capable of reflecting on their experiences and relationships with others and the environment, learning from them, and growing - personally, professionally and socially.

This graduate capability is supported by:

### Learning outcomes

- An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)-- explained through real life examples in environment, society and policy
- Understanding of the linkages between physical science and economics as well as the basic capability to integrate the two --explained through existing socio-economic-climatic models

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- Happens during weekly lectures

## Discipline Specific Knowledge and Skills

Our graduates will take with them the intellectual development, depth and breadth of knowledge, scholarly understanding, and specific subject content in their chosen fields to make them competent and confident in their subject or profession. They will be able to demonstrate, where relevant, professional technical competence and meet professional standards. They will be able to articulate the structure of knowledge of their discipline, be able to adapt discipline-specific knowledge to novel situations, and be able to contribute from their discipline to inter-disciplinary

solutions to problems.

This graduate capability is supported by:

## **Learning outcomes**

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.
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- Mid-Term Exam
- Assignment 2
- Final Exam

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- This will be held as a part of the second assignment
- This is normally done in small groups. Some time will be allocated during the post-break sessions for students to work on the projects in class. However, a majority of this task needs to be completed outside the classroom.

- Are handed out regularly in class
- Happens during weekly lectures

## Critical, Analytical and Integrative Thinking

We want our graduates to be capable of reasoning, questioning and analysing, and to integrate and synthesise learning and knowledge from a range of sources and environments; to be able to critique constraints, assumptions and limitations; to be able to think independently and systemically in relation to scholarly activity, in the workplace, and in the world. We want them to have a level of scientific and information technology literacy.

This graduate capability is supported by:

### Learning outcomes

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.
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needs to be completed outside the classroom.

- Are handed out regularly in class
- Happens during weekly lectures

## Problem Solving and Research Capability

Our graduates should be capable of researching; of analysing, and interpreting and assessing data and information in various forms; of drawing connections across fields of knowledge; and they should be able to relate their knowledge to complex situations at work or in the world, in order to diagnose and solve problems. We want them to have the confidence to take the initiative in doing so, within an awareness of their own limitations.

This graduate capability is supported by:

### Learning outcomes

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.
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### Assessment task

- Assignment 1

### Learning and teaching activity

- Tutorials will be conducted during regular teaching hours.
- These are main lecture sessions conducted once per week.
- Happens during weekly lectures

## Effective Communication

We want to develop in our students the ability to communicate and convey their views in forms effective with different audiences. We want our graduates to take with them the capability to read, listen, question, gather and evaluate information resources in a variety of formats, assess,



write clearly, speak effectively, and to use visual communication and communication technologies as appropriate.

This graduate capability is supported by:

## **Learning outcomes**

- An appreciation of basic economic concepts, frameworks and evaluation methods associated with environmental problems (specifically environmental valuation methods)-- explained through real life examples in environment, society and policy
- An ability to consider environmental policy issues from an economic perspective; ability to objectively analyze economic, environmental and socio-political tradeoffs associated with environmental problems such as global warming--accomplished through consideration of contemporary societal challenges

## **Assessment task**

- Assignment 2

## **Learning and teaching activity**

- These are main lecture sessions conducted once per week.
- This will be held as a part of the second assignment
- This is normally done in small groups. Some time will be allocated during the post-break sessions for students to work on the projects in class. However, a majority of this task needs to be completed outside the classroom.
- Happens during weekly lectures

## **Engaged and Ethical Local and Global citizens**

As local citizens our graduates will be aware of indigenous perspectives and of the nation's historical context. They will be engaged with the challenges of contemporary society and with knowledge and ideas. We want our graduates to have respect for diversity, to be open-minded, sensitive to others and inclusive, and to be open to other cultures and perspectives: they should have a level of cultural literacy. Our graduates should be aware of disadvantage and social justice, and be willing to participate to help create a wiser and better society.

This graduate capability is supported by:

## **Learning outcomes**

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
- An ability to comprehend the role of discounting in inter-temporal and inter-generational problems --concept of discounting and its relevance explained through examples and policy contexts.

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## **Assessment tasks**

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- Assignment 2
- Final Exam

## **Learning and teaching activities**

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## **Socially and Environmentally Active and Responsible**

We want our graduates to be aware of and have respect for self and others; to be able to work with others as a leader and a team player; to have a sense of connectedness with others and country; and to have a sense of mutual obligation. Our graduates should be informed and active participants in moving society towards sustainability.

This graduate capability is supported by:

## **Learning outcomes**

- An ability to do basic cost-benefit analysis of environmental policies and outcomes -- through the use of numerical examples. No prior exposure to economics is assumed.
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