ENVS810
Environmental Economics
S1 Day 2016
Dept of Environmental Sciences

Contents

General Information 2
Learning Outcomes 3
General Assessment Information 3
Assessment Tasks 3
Delivery and Resources 5
Unit Schedule 6
Learning and Teaching Activities 14
Policies and Procedures 14
Graduate Capabilities 16

Disclaimer
Macquarie University has taken all reasonable measures to ensure the information in this publication is accurate and up-to-date. However, the information may change or become out-dated as a result of change in University policies, procedures or rules. The University reserves the right to make changes to any information in this publication without notice. Users of this publication are advised to check the website version of this publication [or the relevant faculty or department] before acting on any information in this publication.
**Unit guide** ENVS810 Environmental Economics

## General Information

<table>
<thead>
<tr>
<th>Unit convenor and teaching staff</th>
</tr>
</thead>
</table>
| Instructor                       | Ram Ranjan  
|                                  | ram.ranjan@mq.edu.au  
| Contact via email                |  
|                                  | Australian Hearing Hub, Second Floor, Room W1A 2.325  
|                                  | TBA  

<table>
<thead>
<tr>
<th>Credit points</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

### Prerequisites

Admission to ME and/or PGDM or PGCEn or MEEnD or PGDeEnEd or PGCEnEd or MEcMgt or PGCEnMgt or MENvStud or PGDeEnStud or MEnvPlan or MEnvSc or MSsDev or PGDeSusDev or PGCertSusDev or MClmCh or MWhMgt or PGDeWldMgt or PGCertWldMgt or MMarScMgt or MSc in (Remote Sensing and GIS or Environmental Health) or PGDeSc in (Remote Sensing and GIS or Environmental Health) or PGCertSc in (Remote Sensing and GIS or Environmental Health) or MPPP or PGDePP or GradDeEn or GradCertEn or GradCertSusDev or GradDeSusDev or MConsBiol or GradDeConsBiol

### Corequisites

### Co-badged status

### Unit description

This unit provides a comprehensive coverage of environmental economics and has been structured on the premise that course participants have little background in economics. The unit presents a different paradigm to conventional economics and illustrates how the study of mainstream economics needs to be reoriented in the light of the following premises: the natural environment is the core of any economy, and economic sustainability cannot be attained without environmental sustainability. The unit equips participants with an ability to engage in multi-disciplinary teams with environmental economists; analyse environmental and economic policy issues; and understand the nature of trade-off between environmental quality and economic growth. Examples of topics and methods covered include – cost-benefit analysis; environmental valuation methods; market failure, externalities and public goods; economics of climate change management including strategic behaviour using game theory; trade and the environment; hysteresis and resilience; taxes versus quotas; renewable and non-renewable resource management; economics of urban planning, transport, infrastructure and urban sprawl; managing irreversible and catastrophic events; risk, risk weighting and option value approach.
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](https://www.mq.edu.au/study/calendar-of-dates)

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

- The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
- An understanding of the key economic concepts and topics relevant in Env Econ—discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
- An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
- Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
- Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

General Assessment Information
Project reports are due by the deadline. Class participation is required for all sessions. You must make a presentation and submit a report to satisfactorily complete the course.

Assessment Tasks

<table>
<thead>
<tr>
<th>Name</th>
<th>Weighting</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Report</td>
<td>50%</td>
<td>May 29</td>
</tr>
<tr>
<td>Presentation</td>
<td>25%</td>
<td>May 29</td>
</tr>
<tr>
<td>Class Participation</td>
<td>25%</td>
<td>throughout the course</td>
</tr>
</tbody>
</table>

Project Report
Due: May 29
Weighting: 50%

This is the main assignment in this unit and carries a weight of 50 percent. The assignment involves performing an empirical cost-benefit analysis of an environmental project. This exercise is to be performed in small groups. Relevant details will be provided during the first block.
sessions.

A hard copy of the report must be submitted by the due date (**May 29**). An electronic copy of the same report, that also includes the data files and the excel files showing detailed calculations, must also be submitted by email by the due date.

Maximum allowed length for the report is 8000 words (excluding figures and tables and information contained in excel files or other data sheets). Further details on the rules of group work and marking criteria will be provided on iLearn.

No late submissions will be allowed.

Participating in group work related to the project report and submission of the report is a requirement for satisfactory completion of this unit. Students must follow the rules of group work and may not work individually on this project.

On successful completion you will be able to:

- The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
- An understanding of the key economic concepts and topics relevant in Env Econ--discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
- An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
- Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
- Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

**Presentation**

**Due:** **May 29**  
**Weighting:** **25%**

involves presenting findings from the project report.

Presenting your project findings and participating in class discussions is a requirement for satisfactory completion of this unit.

Further details on marking criteria will be provided on iLearn.

On successful completion you will be able to:

- The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
Unit guide ENVS810 Environmental Economics

• An understanding of the key economic concepts and topics relevant in Env Econ—discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
• An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
• Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
• Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

Class Participation

Due: throughout the course
Weighting: 25%

Class participation activities will involve: answering and asking questions during all block sessions including those during student presentations.

Details over marking criteria for this assessment task will be provided on iLearn

On successful completion you will be able to:
• The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
• An understanding of the key economic concepts and topics relevant in Env Econ—discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
• An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
• Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
• Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

Delivery and Resources

Technology used: Students will need access to a computer with internet in order to participate in the online component of this unit which uses i-Learn.

In addition, students will be expected to participate in hands-on training in the computer lab as required.
An attempt will be made to provide all reading materials (except journal articles and books) on iLearn. Journal articles may not be available on iLearn due to copyright protections but students may obtain it through the library or the instructor.

Reading materials include:
- Lecture notes
- Tutorial Examples
- Excel Examples
- Class handouts
- Instructor's notes during one-on-one sessions

**Unit Schedule**

**Classes**
The lectures will be delivered in several block sessions to be held at Macquarie University. Refer to Timetable for most updated block session dates.

Details of Block Sessions:
- First Block Session will be held on **March 12 and 13** (9 am to 5 pm)--Lectures
- Second Session will be held on **March 19 and 20** (9 am to 5 pm)--Lectures
- Third Session will be held on **April 30** (9 am to 5 pm)--Lab Sessions
- Final session will be held on **May 29** (9 am to 5 pm)--Presentations.

**Attendance is required for ALL teaching days noted above.**

**Reading and Course Preparation Guide**

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 Titenberg and Lewis

The list of topics and reading guides are given below:

This list is not exhaustive, new topics and papers will be added from time to time.
Topics Covered

1. The Environment and the Economy
   - Introduction to Basic Micro Economics
   - Need for Environmental Economics
   - Willingness to Pay (WTP)
   - Demand Function
   - Consumer Surplus
   - Cost Benefit Analysis (CBA)
   - Discounting the Future
   - CBA under uncertainty
   - Case Study
   - Environmental Accounting

2. Market and the Environment
   - Economic Efficiency
   - Externalities
   - Market Failure
   - Property Rights
   - Insurance Markets for Natural Hazards
   - Case Study: Are you being Served?
   - Case Study: Elephants

3. Environmental Valuation
   - Valuation Methods
   - Contingent Valuation
   - Hedonic Valuation Method
   - Travel Cost Valuation Method
   - Value of Water

4. The Science and Economics of Global Warming
   - Scientific Evidence and Understanding
   - Integrating with Economics
   - Empirical Estimation of Costs and Benefits
   - Economic Management tools and Cost Benefit Analysis
   - Discounting and Time Preference
   - Catastrophes
5. Trade and the Environment

- Environmental Kuznets Curve
- Taxes Versus Quotas
- Trade and the Environment
- Hysteresis and Resilience
- Measuring Health Impacts of Pollution

6. Economics of Renewable and Non-Renewable Resources

- Economics of non-renewable resource extraction
- Economics of oil
- Economics of renewable resource extraction
- Fisheries, Forestry
- Challenges in fisheries Management

7. Economics of Urban Planning

- Theory of origin of urban areas
- What are some of the tools available to the city planner to maximize societal welfare in urban areas?
- Problems and challenges in applying those tools
- Rent control and Property Taxes
- Case Study

8. Economics of Transport/Infrastructure

- Economics of Providing Transport Infrastructure
- Use of Renewable Resources in Transportation
- Rebound Effect
- Global Warming, Energy Use and Transportation Linkage
- Political Economy of Urban Transportation
- Congestion Pricing

9. Economics of Urban Sprawl

- Factors causing urban sprawl
- Three types of Market Failures (for Urban Sprawl)
- Costs and Benefits of Land Use Planning
- Managing Sprawl
- Agriculture and Urban Sprawl
Supplementary Reading List for GSE 810

***are recommended, ** are additional readings, * are technical papers

(The aim of providing this guide is to facilitate advance preparation for on-campus lecture/discussion sessions. Students will be expected to use the information in the below readings while preparing their projects. The topics and methods used for the projects will be explained during the first session in class)

In addition, students should pay particular attention to articles published in Rev Environ Econ Policy (http://reep.oxfordjournals.org/) as papers published here can provide a comprehensive account of below topics without getting into much technical detail.

**Topics**

**Cost Benefit Analysis/Inter-Generational Choice/Uncertainty**


Pollution Regulation, Markets and Property Rights


***Phaneuf, D. (2007): The Economics of Pollution Control, Agricultural and Resource Economics • May/June 2007


Environmental Valuation


Trade and the Environment


**Renewable Resource Management**


**Externalities, Coase Theorem and Property Rights**


https://unitguides.mq.edu.au/unit_offerings/60269/unit_guide/print


**Non Renewable Resources and Green Growth**


**Managing Global Warming and Environmental Catastrophes**


**Ecological Resilience/Hysteresis**


**Land Use and Urban Planning**


**Ostrom, E., and R. Gardner. (1993). Coping with Asymmetries in the Commons: Self-
Learning and Teaching Activities

Lectures
Lectures will be highly interactive in nature and students will be asked to participate in problem solving as well respond to questions posed to them

Computer lab sessions
for teaching CBA and project preparation

Project preparation
Main activity of the course

Presentation
Presenting project outcomes

Additional one-on-one sessions with the Instructor
Students will be asked to meet with the instructor in small groups and discuss their project work

Class Participation
Active class participation throughout the course

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


Disruption to Studies Policy 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/](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

PG - Capable of Professional and Personal Judgment and Initiative

Our postgraduates will demonstrate a high standard of discernment and common sense in their professional and personal judgment. They will have the ability to make informed choices and decisions that reflect both the nature of their professional work and their personal perspectives.

This graduate capability is supported by:

Learning outcomes

- The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
- An understanding of the key economic concepts and topics relevant in Env Econ—discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
- An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
- Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
- Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

Assessment tasks

- Project Report
- Presentation
- Class Participation

Learning and teaching activities

- Lectures will be highly interactive in nature and students will be asked to participate in problem solving as well respond to questions posed to them
- Main activity of the course
- Presenting project outcomes
- Active class participation throughout the course

PG - Discipline Knowledge and Skills

Our postgraduates will be able to demonstrate a significantly enhanced depth and breadth of knowledge, scholarly understanding, and specific subject content knowledge in their chosen
fields.

This graduate capability is supported by:

**Learning outcomes**

- The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
- An understanding of the key economic concepts and topics relevant in Env Econ--discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
- An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
- Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
- Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

**Assessment tasks**

- Project Report
- Presentation
- Class Participation

**Learning and teaching activities**

- Lectures will be highly interactive in nature and students will be asked to participate in problem solving as well respond to questions posed to them
- for teaching CBA and project preparation
- Main activity of the course
- Presenting project outcomes
- Active class participation throughout the course

**PG - Critical, Analytical and Integrative Thinking**

Our postgraduates will be capable of utilising and reflecting on prior knowledge and experience, of applying higher level critical thinking skills, and of integrating and synthesising learning and knowledge from a range of sources and environments. A characteristic of this form of thinking is the generation of new, professionally oriented knowledge through personal or group-based critique of practice and theory.

This graduate capability is supported by:
Learning outcomes

• The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
• An understanding of the key economic concepts and topics relevant in Env Econ—discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
• Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
• Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

Assessment tasks

• Project Report
• Presentation
• Class Participation

Learning and teaching activities

• Lectures will be highly interactive in nature and students will be asked to participate in problem solving as well respond to questions posed to them
• for teaching CBA and project preparation
• Main activity of the course
• Presenting project outcomes
• Active class participation throughout the course

PG - Research and Problem Solving Capability

Our postgraduates will be capable of systematic enquiry; able to use research skills to create new knowledge that can be applied to real world issues, or contribute to a field of study or practice to enhance society. They will be capable of creative questioning, problem finding and problem solving.

This graduate capability is supported by:

Learning outcomes

• The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
• An understanding of the key economic concepts and topics relevant in Env Econ—discounting, WTP, valuation, CBA, risk management, urban planning, managing water
An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
• Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
• Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

Assessment tasks
• Project Report
• Class Participation

Learning and teaching activities
• Lectures will be highly interactive in nature and students will be asked to participate in problem solving as well respond to questions posed to them
• for teaching CBA and project preparation
• Main activity of the course
• Presenting project outcomes
• Students will be asked to meet with the instructor in small groups and discuss their project work
• Active class participation throughout the course

PG - Effective Communication
Our postgraduates will be able to communicate effectively and convey their views to different social, cultural, and professional audiences. They will be able to use a variety of technologically supported media to communicate with empathy using a range of written, spoken or visual formats.

This graduate capability is supported by:

Learning outcomes
• An understanding of the key economic concepts and topics relevant in Env Econ-- discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
• An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
• Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture

Assessment tasks
- Project Report
- Presentation
- Class Participation

Learning and teaching activities
- Lectures will be highly interactive in nature and students will be asked to participate in problem solving as well respond to questions posed to them
- Main activity of the course
- Presenting project outcomes
- Active class participation throughout the course

PG - Engaged and Responsible, Active and Ethical Citizens
Our postgraduates will be ethically aware and capable of confident transformative action in relation to their professional responsibilities and the wider community. They will have a sense of connectedness with others and country and have a sense of mutual obligation. They will be able to appreciate the impact of their professional roles for social justice and inclusion related to national and global issues

This graduate capability is supported by:

Learning outcomes
- The course is intended to equip participants with introductory skills that would enable the analysis of environmental and economic policy issues.
- An understanding of the key economic concepts and topics relevant in Env Econ—discounting, WTP, valuation, CBA, risk management, urban planning, managing water scarcity, economics of climate change, emissions trading, permits vs quotas, managing renewable and non-renewable resources, urban sprawl, etc
- An enhanced understanding of the contemporary environmental and related societal problems that could be addressed using some basic tools in economic analysis
- Capability to formulate environmental problems using Cost-Benefit Analysis (CBA)
- Understanding of resource constraints and management challenges faced by urban planners in the context of water scarcity, carbon mitigation and climate change adaptation challenges. Managing water scarcity in agriculture
Assessment tasks

- Project Report
- Presentation
- Class Participation

Learning and teaching activities

- Lectures will be highly interactive in nature and students will be asked to participate in problem solving as well respond to questions posed to them
- Main activity of the course
- Presenting project outcomes
- Active class participation throughout the course