



GSE 810

Environmental Economics

S1 Day 2015

Dept of Environmental Sciences

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Disclaimer

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General Information

Unit convenor and teaching staff

Instructor

Ram Ranjan

ram.ranjan@mq.edu.au

Contact via email

E7A- 730 (this will change during the semester, please check on ilearn for updates)

TBA

Credit points

4

Prerequisites

Admission to MEnv or PGDipEnv or PGCertEnv or MEnvEd or PGDipEnvEd or PGCertEnvEd or MEnvMgt or PGCertEnvMgt or MEnvStud or PGDipEnvStud or MEnvPlan or MEnvSc or MSusDev or PGDipSusDev or PGCertSusDev or MClimCh or MWldMgt or PGDipWldMgt or PGCertWldMgt or MMarScMgt or MSc in (Remote Sensing and GIS or Environmental Health) or PGDipSc in (Remote Sensing and GIS or Environmental Health) or PGCertSc in (Remote Sensing and GIS or Environmental Health) or MPP or PGDipPP or GradDipEnv or GradCertEnv or GradCertSusDev or GradDipSusDev or MConsBiol or GradDipConsBiol

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>

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

Name	Weighting	Due
Project Report	60%	May 30
Presentation	20%	May 30, 31
Class Participation	20%	All Sessions

Project Report

Due: **May 30**

Weighting: **60%**

This is the main assignment in this unit and carries a weight of 60 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 30**). 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 will be provided in class.

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 30, 31**

Weighting: **20%**

involves presenting findings from the project report.

Presenting your project findings and participating in class discussions on these days (**on May 30 and 31**) is a requirement for satisfactory completion of this unit.

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

Class Participation

Due: **All Sessions**

Weighting: **20%**

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

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.

Details of Block Sessions:

First Block Session will be held on **April 4 and 5** (9 am to 5 pm)--Lectures

Second Session will be held on **April 11 and April 12** (9 am to 5 pm)--Lectures

Third session will be held on **May 1** (9 am to 5 pm), **May 2** (9 am to 5 pm) and **May 3** (9 am to 5 pm)--Lab Sessions

Final session will be held on **May 30** (9 am to 5 pm) and **May 31** (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 Tietenberg 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
- Thermohaline Circulation Belt /Permafrost

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
- Sprawl and the Environment

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

***Hanley, N. (1992): Are there environmental limits to cost benefit analysis? [Environmental and Resource Economics, Volume 2, Number 1](#), 33-59

***Dasgupta, P. (1996): The Economics of the Environment. *Environment and Development Economics*, 1, 387-429.

***Pearce, D. W. (1976): Cost-Benefit Analysis and Environmental Policy. *Oxford Review of Economic Policy*, vol. 14 (4):

**d'Arge, R. C., W. S. Schulze, and D. S. Brookshire. (1982): Carbon Dioxide and Intergenerational Choice. *American Economic Review*, 72, 251-256.

*Graham, Daniel A. (1981): Cost-Benefit Analysis under Uncertainty. *American Economic Review*, 71, 715-725.

*Norgaard, R. B., and R. B. Howarth (1991). Sustainability and Discounting the Future. In R. Costanza (Ed.), *Ecological Economics* (pp. 525p). New York: Columbia University Press.

Pollution Regulation, Markets and Property Rights

***Krugman, P. (2010): California Death Spiral, NYT, Feb 19, 2010

- ***Phaneuf, D. (2007): The Economics of Pollution Control, Agricultural and Resource Economics • May/June 2007
- ***Oates, W. E. (1995): Green Taxes: Can We Protect the Environment and Improve the Tax System at the Same Time? *Southern Economic Journal* 61, pp. 914-922.
- ***Goulder, L. H. (1995): Environmental Taxation and the Double Dividend: A Reader's Guide. *International Tax and Public Finance* 157-183.
- ***Viscusi, W. K. (1996): Economic Foundations of the Current Regulatory Reform Efforts. *Journal of Economic Perspectives*, 10(3), 119-134.
- ***Anderson, S.T., I.W.H. Parry, J.M. Saltee and C. Fischer (2011): Automobile Fuel Economy Standards: Impacts, Efficiency, and Alternatives, *Rev Environ Econ Policy* (2011) 5 (1): 89-108.
- ***Convery, F. (2011): Reflections-Energy Efficiency Literature for Those in the Policy Process, *Rev Environ Econ Policy*, 5(1): 172-191
- ***Carson, R.T. (2010): The Environmental Kuznets Curve: Seeking Empirical Regularity and Theoretical Structure, *Rev Environ Econ Policy* 4(1): 3-23.
- **Mäler, Karl-Göran and C. Olsson (1990): The cost-effectiveness of different solutions to the European sulphur problem, *European Review of Agricultural Economics*, vol 17, pp 153-166
- *Pizer, W. A. (1997): Prices vs. Quantities Revisited: The Case of Climate Change. Working Paper, Resources for the Future, Washington, D.C.
- *Mendelsohn, R. (1986): Regulating Heterogeneous Emissions. *Journal of Environmental Economics and Management*, 13, 301-312.
- *Keohane, N., R. Revesz, and R. Stavins (1998). The Choice of Regulatory Instruments in Environmental Policy. *Harvard Environmental Law Review*, volume 22, number 2, pp. 313-367
- *Kerr, S., and D. Maré. (1997): Efficient Regulation Through Tradeable Permit Markets: The United States Lead Phasedown, Department of Agricultural and Resource Economics, University of Maryland, College Park, Working Paper 96-06.
- *Green, R. J., and D. M. Newbery (1992): Competition in the British Electricity Spot Market. *Journal of Political Economy*, 100(5), 929-953.
- *Hanley, N., J. Shogren, and B. White (1997): *Environmental Economics. Theory and Practice*. Oxford and London: Oxford University Press and MacMillan Publishers, p. 464.
- *Stephen S. and J. Swierzbinski (2006): Assessing the performance of the UK Emissions Trading Scheme, *Environmental and Resource Economics*, 37(1), pp 131-158, 2007.
- *Suzi K. and D. Maré (1998): Transaction Costs and Tradable Permits. The United States Lead Phasedown, mimeo, Motu Research Trust, NZ.
- * Lofgren A. and H. Hammar (2000): The phase-out of leaded gasoline in the EU: a successful failure? *Transportation Research Part D*, 419-431.
- *Weitzman, M. L. (1974): Prices vs. Quantities. *Review of Economic Studies*, 41, 477-491.

Environmental Valuation

***Barbier, E. B. (2012): Progress and Challenges in Valuing Coastal and Marine Ecosystem Services, *Rev Environ Econ Policy*, forthcoming

***Economist (2005): Are You Being Served, April 21, 2005.

**Randall, A. (1991): The Value of Biodiversity. *Ambio*, 20(2), 64-68.

***Cork, S. J., D. Shelton (2000): The Nature and Value of Australia's Ecosystem Services: A Framework for Sustainable Environmental Solutions, (http://www.ecosystemservicesproject.org/html/publications/docs/Qld_Env_Conf_Paper.pdf)

**Kirkpatrick S. (online): The Economic Value of Natural and Built Coastal Assets (<http://www.nccarf.edu.au/settlements-infrastructure/node/79>)

*Hanemann, W. M. (1991): Willingness to Pay and Willingness to Accept: How Much Can They Differ? *American Economic Review*, 81, 635-647.

*Ward, F.A., and J. B. Loomis. (1986): The Travel Cost Demand Model as an Environmental Policy Assessment Tool: A Review of the Literature. *Western Journal of Agricultural Economics*, 11, 164-178.

*Palmer, K., A. Krupnick, H. Dowlatabadi, and S. Siegel (1995): Social Costing of Electricity in Maryland: Effects on Pollution, Investment and Prices. *The Energy Journal*, 16(1), 1-26.

*Coursey, D. L., J. J. Hovis, and W. D. Schulze (1987): The Disparity between Willingness to Accept and Willingness to Pay Measures of Value. *Quarterly Journal of Economics*, 102, 679-690.

*Cameron, T. A. (1992) Combining Contingent Valuation and Travel Cost Data for the Valuation of Nonmarket Goods. *Land Economics*, pp. 302-317.

*Carson, R. T. and R. C. Mitchell. (1993): The Value of Clean Water: Willingness to Pay for Boatable, Fishable, and Swimmable Water quality. *Water Resources Research* VOL. 29, NO. 7, PP. 2445-2454, 1993

*Chakravorty, U., J. Roumasset, and K. Tse (1997): Endogenous Substitution among Energy Resources and Global Warming. *Journal of Political Economy*, 105, 1201-1234.

Trade and the Environment

***Levinson, A. (2010): Offshoring Pollution: Is the United States Increasingly Importing Polluting Goods? *Rev Environ Econ Policy*, 4(1): 63-83

***Fischer, C. (2010): Does Trade Help or Hinder the Conservation of Natural Resources, *Rev Environ Econ Policy*, 4(1): 103-121

*Chichilniskly, G. (1994): North-South Trade and the Global Environment. *American Economic*

Review, 84(4), 851- 874.

*Chichilnisky, G. (1997): What Is Sustainable Development. *Land Economics*, 73, 476-491.

*Copeland, B. R., and M. S. Taylor (1994): North-South Trade and the Environment. *Quarterly Journal of Economics*, 109(3), 755-787.

*Grossman, G. M., and A. B. Krueger (1995): Economic Growth and the Environment. *Quarterly Journal of Economics*, 110(2), 353-377.

Renewable Resource Management

***Binswanger, H.C. and R.N. Chakraborty (2000): The Economics of Resource Management

***Schmalensee, R. (2012): Evaluating Policies to Increase Electricity Generation from Renewable Energy, *Rev Environ Econ Policy*, forthcoming

***Heal, G. (2010): Reflections—The Economics of Renewable Energy in the United States, *Rev Environ Econ Policy*, 4(1): 139-154

**Rajagopal, D. and D. Zilberman (2007): Review of Environmental, Economic and Policy Aspects of Biofuels, Policy Research Working Paper, 4341, World Bank,

*Pfaff, A. S. P. (1999): What Drives Deforestation in the Brazilian Amazon? Evidence from Satellite and Socioeconomic Data. *Journal of Environmental Economics and Management*, 37(2), 26-43.

*Mitra, T., and H. Y. Wan, Jr. (1986): On the Faustmann Solution to the Forest Management Problem. *Journal of Economic Theory*, 40, 229-249.

*Mitra, T., and H. Y. Wan, Jr. (1985): Some Theoretical Results on the Economics of Forestry. *Review of Economic Studies*, 52, 263-282.

*Conrad, J. M. (1989): Bioeconomics and the Bowhead Whale. *Journal of Political Economy*, 97, 974-987.

*Clark, C. W. (1973): The Economics of Overexploitation. *Science*, 181, 630-634.

*Clark, C. W. (1990): *Mathematical Bioeconomics: The Optimal Management of Renewable Resources*. (2 ed.). New York: Wiley Inter-Interscience, John Wiley and Sons, Inc.

*Clark, C. W., and G. R. Munro. (1975): Economics of Fishing and Modern Capital Theory: A Simplified Approach. *Journal of Environmental Economics and Management*, 2, 91-106.

Externalities, Coase Theorem and Property Rights

***Coase, R. H. (1960): The Problem of Social Cost. *Journal of Law and Economics*, 3, 1-44.*Oates, W. E. (1983): The Regulation of Externalities: Efficient Behavior by Sources and Victims. *Public Finance*, 38, 362-375.

*Stavins, R. N. (1995): Transaction Costs and Tradeable Permits. *Journal of Environmental*

Economics and Management 29, 133-148.

*Freeman, A. M. (1984): Depletable Externalities and Pigouvian Taxation. *Journal of Environmental Economics and Management*, 11, 173-179.

Non Renewable Resources and Green Growth

***Crandall, Robert W. (1992): Corporate Average Fuel Economy Standards. *Journal of Economic Perspectives*, 6(2), 171-180. ***Poterba, J. (1994): Is the Gasoline Tax Regressive? *Tax Policy and the Economy*, 5, 145-164.

**Godek, P. E. (1997): The Regulation of Fuel Economy and the Demand for Light Trucks. *Journal of Law and Economics*, 40(October), 495-509.

Managing Global Warming and Environmental Catastrophes

***Keller, K., G. Yohe, and M. Schlesinger (2008): Managing the risks of climate thresholds: Uncertainties and needed information. *Climatic Change*, 91, 5-10.

***Popp, D. (2011): International Technology Transfer, Climate Change, and the Clean Development Mechanism, *Rev Environ Econ Policy*, 5((1) 131-152

***Bosetti, V. and J. Frankel (2012): Politically Feasible Emissions Targets to Attain 469 ppm CO₂ Concentrations, *Rev Environ Econ Policy*, Forthcoming,

Ecological Resilience/Hysteresis

***Scheffer, M., S. Carpenter, J. A. Foley, C. Folke & B. Walker (2001): Catastrophic shifts in ecosystems, *Nature* 413, 591-596 (11 October 2001)

**Kiker, C. F. and E. Putz (1997): Ecological certification of forest products: Economic challenges. *Ecological Economics*, 20, 37-51.

**Metrick, A. and M. L. Weitzman (1998): Conflicts and Choices in Biodiversity Preservation. *Journal of Economic Perspectives*, volume 12, number 3, pp. 21-34.

*Krutilla, J. V. (1964): Conservation Reconsidered. *American Economic Review*, 57, 777-786

Land Use and Urban Planning

***Grafton, R.Q. (online): Economics of Water Reform in the Murray Darling Basin (http://www.pc.gov.au/__data/assets/pdf_file/0008/94850/subdr081.pdf)

**Ostrom, E., and R. Gardner. (1993). Coping with Asymmetries in the Commons: Self-Governing Irrigation Systems Can Work. *Journal of Economic Perspectives*, 7(4), 93-112.

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

Assessment Policy <http://mq.edu.au/policy/docs/assessment/policy.html>

Grading Policy <http://mq.edu.au/policy/docs/grading/policy.html>

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

Grievance Management Policy http://mq.edu.au/policy/docs/grievance_management/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/

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](#).

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) 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

IT Help

For help with University computer systems and technology, visit <http://informatics.mq.edu.au/help/>.

When using the University's IT, you must adhere to the [Acceptable Use 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
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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

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

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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

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
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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

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 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
- 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

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

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