

Course title: Environmental Economics				
Course code: NRE 147	No. of credits: 3	L-T-P: 28-14-0	Learning hours: 42	
Pre-requisite course code and title (if any): NRE 115 Environmental Statistics NRE 141 Basic course in Environmental and Resource Economics				
Department: Energy and Environment				
Course coordinator:		Course instructor: Dr Meera Bhatia Mehrotra		
Contact details: meera03@gmail.com				
Course type: Elective		Course offered in: Semester 3		
Course Description This course will familiarize students with the theory and application of economics to environmental problems and prepare them for analysing issues in environmental economics and policy. It will focus on the design of cost-effective environmental policies and on methods for determining the value of environmental amenities. The course consists of lectures, student led discussions, student presentations and other assignments. To achieve the course objectives, active participation in class and timely completion of assignments are important. Students are also expected to search for currently debated environmental problems and policies in India and other countries that would trigger discussions in the class, especially during tutorials. The course relies on select mathematical methods and techniques such as differentiation, select methods in econometrics.				
Course objectives 1. To introduce the students to the theory and application of economics to environmental problems. 2. To familiarize them with current methods of valuation of environmental assets including stated and revealed preference methods of environmental valuation. 3. To introduce them to different instruments of environmental policy for managing environmental degradation including traditional command and control and market based instruments. 4. To provide exposure to the interlinkages between economy, environment and trade. 5. Introduce students to the key aspects of current global issues like climate change.				
Course content				
Module	Topic	L	T	P
1.	Markets and efficiency Market failure- Incomplete markets- Externalities- Non-exclusion and the commons- Non-rivalry & public goods (including newly emerging concept of global public goods)- Non-convexities- Asymmetric information	2	2	0
2.	A refresher in basic mathematical analysis/econometrics Differential and integral calculus- Select concepts in econometrics (handy for valuation methods)	4	2	0
3.	Applications of Valuation Methods (min 3) - Reference from SANDEE Valuation book or Technical Paper	6	4	0
4.	Environmental policy instruments Regulating pollution through standards Pigouvian fees Emissions fees and marketable permits Regulation with unknown control costs Audits, enforcement and moral hazard Environmental policy and technological changes Porter's hypothesis	8	4	0
5.	Environmental and economic accounting	4	2	0
6.	International trade and environment International trade and environment linkages Global environmental issues	4	0	0
Total		28	14	

Evaluation criteria

- 1 Term paper: 25%
- Test 1: 15%
- Test 2: 15%
- Test 3 : 45%

Learning outcomes

After taking the course, the students will be able

- To understand basic economic concepts such as externalities, private and social costs, market failure and how environmental goods differ from private goods.
- To learn current methodologies used in the valuation of environmental goods and services including cost benefit analysis and non-market valuation.
- To understand the role of government and different instruments of environmental policy.
- To understand the interlinkages between trade and environment as well as economic aspects of global environmental issues
- To summarize, present and convey the key trade offs involved in the current environmental issues, especially their economics aspects.

Pedagogical approach

Lectures will be supplemented by seminal readings on key environmental issues. Assignment components will include writing and analysing selected environmental issues and presenting the same.

Materials

Required text

1. Jha V., Markandya A. and Vossenaar R. (1999) *Reconciling Trade and the Environment: Lessons from Case Studies in Developing Countries*, Cheltenham, Edward Elgar Publications.
2. Murty M.N. and Kumar S. (2004) *Environmental and Economic Accounting for Industry*, Oxford University Press.

Suggested readings

1. Baumol W.J. and Oats W.E. (1994) *The Theory of Environmental Policy*, Second Edition, Cambridge University Press.
2. Freeman M.A. (2003) *The Measurement of Environmental and Resource Values: Theory and Methods*, Second Edition. Resources for the Future.
3. Hanley N., Shogren J.F. and White B. (1997) *Environmental Economics in Theory and Practice*, Macmillan Publishers, India.
4. Kolstad C.D. (2003) *Environmental Economics*, Oxford University Press.
5. Stavins R.N. (2000) *Economics of the Environment: Selected Readings*, Fourth Edition, W.W. Norton and Company.
6. Tietenberg T. (1994) *Environmental and Natural Resource Economics*, Harper Collins.
7. Xepapadeas A. (1997) *Advanced Principles in Environmental Policy*, Edward Elgar, Cheltenham, U.K.

Selected Papers

1. Guha, I and S. Ghosh (2009) 'A Glimpse of the Tiger: How Much are Indians Willing to Pay for It?' Working Paper, South Asian Network for Development and Environmental Economics (SANDEE), No. 39-09
2. Godfrey, S. P. Labhasetwar, and S. Wate. (2009) "Greywater reuse in residential schools in Madhya Pradesh, India—A case study of cost–benefit analysis". *Resources, Conservation and Recycling* 53 -287–293
3. S. Balakumar and S. Das (2015). Investigating Household Preferences for Restoring Pallikaranai Marsh. Madras School of Economics. WORKING PAPER 126/2015.
4. M. N. Murty, Gulati.S.C and A. Banerjee. (2003) Health Benefits from Urban Air Pollution Abatement in the Indian Subcontinent. Working Paper. Institute of Economic Growth.

5. M. N. Murty, Gulati.S.C and A. Banerjee. (2003) Hedonic Property Prices and Valuation of Benefits From Reducing Urban Air Pollution in India. Working Paper. Institute of Economic Growth.
6. Lupi, F., et al. (2001) The Michigan Recreational Angling Demand Model. In: Microbehavior and Macroresults: Proceedings of the Tenth Biennial Conference of the International Institute of Fisheries Economics and Trade, July 10-14, 2000, Corvallis, Oregon, USA. International Institute of Fisheries Economics and Trade (IIFET), Corvallis, 2001.
7. Alberini A. and Cropper M. (1998) Contingent Valuation, in *The New Palgrave Dictionary of Economics and the Law*, P. Newman (ed.).
8. Arrow K.J., Dasgupta P., Goulder L., Daily G., Ehrlich P., Heal G., Levin S., Mäler G., Schneider S., Starrett D. and Walker B. (2004) Are We Consuming Too Much? *Journal of Economic Perspectives*, 18(3), 147-172.
9. Barrett S. (2000) Introduction to the Special Issues on Trade and Environment: Local versus Multilateral Reforms, *Environment and Development Economics*, Vol. 5, Part 4, pp. 349-359.
10. Bohm P. and Russell C.S. (1985) Comparative Analysis of Alternative Policy Instruments, In A.V. Kneese and J.L. Sweeney (eds), *Handbook of Natural Resource and Energy Economics*, Vol. I, North Holland, Amsterdam, 395-460.
11. Burrows P. (1995) Nonconvexities and the Theory of External Costs, In D. Bromley (ed.) *Handbook of Environmental Economics*, Blackwell, Oxford, U.K. 243-250.
12. Burtraw D. (1996) The SO₂ Emissions Trading Program: Cost Savings without Allowance Trades, *Contemporary Economic Policy*, April, 79-94.
13. Chichilinsky G. and Heal G. (1994) Who Should Abate Carbon Emissions: An International Viewpoint, *Economics Letters*, 443-449.
14. Coase R.H. (1960) The Problem of Social Costs, *Journal of Law and Economics*, 3, 1-44, Cropper M. and Oates W.E., 1992, Environmental Economics: A Survey, *Journal of Economic Literature*, 30, 675-740.
15. Hanemann W.M. (1991) Willingness to Pay and Willingness to Accept: How Much Can They Differ? *American Economic Review*, 81, 635-647.
16. Harrison D. Jr. and Rubinfeld D.L. (1978) Hedonic Housing Prices and the Demand for Clean Air, *Journal of Environmental Economics and Management*, 5, 81-102.
17. Helfand G.E. (1991) Standards versus Standards: The Effect of Different Pollution Restrictions, *American Economic Review*, 81, 622-634.
18. Holterman S. (1976) Alternative Tax Systems to Correct for Externalities and the Efficiency of Paying Compensation, *Economica*, 1-16.
19. Jaffe A.B., Newell R.G. and Stavins R.N. (2002) Environmental Policy and Technological Change, *Environmental and Resource Economics*, 22, 41-69.
20. Khanna M. (2001) Non-mandatory Approaches to Environmental Protection, *Journal of Economic Surveys*, 15(3), 291-324.
21. Kumar S. (2005) Environmentally Sensitive Productivity Growth: A Global Analysis Using Malmquist-Luenberger Index, *Ecological Economics*.
22. Kumar S. and Khanna M. (2005) Measurement of Environmental Efficiency and Productivity: A Cross Country Analysis', Working Paper No. 29, National Institute of Public Finance and Policy, New Delhi.
23. Kumar S. and Rao D.N. (2001) Valuing the Benefits of Air Pollution Abatement: Using a Health Production Function, *Environmental Resource Economics*, 21, 91-102.
24. Murty M.N. and Kumar S. (2002) Measuring Cost of Sustainable Industrial Development in India: A Distance Function Approach, *Environment and Development Economics*, Vol. 7, pp. 467-486.
25. Murty M.N. and Kumar S. (2003) Win-Win Opportunities and Environmental Regulation: Testing the Porter Hypothesis for Indian Manufacturing Industries, *Journal of Environmental Management*, 67(2), pp. 139-144.

26. Pendleton L. and Mendelsohn R. (2000) Estimating Recreation Preferences Using Hedonic Travel Cost and Random Utility Models, *Environmental Resource Economics*, 17, 89-108.
27. Schmalensee R. et al. (1998) An Interim Evaluation of the Sulfur Dioxide Emissions Trading, *Journal of Economic Perspectives*, P 3, 53-68.
28. Seskin E.P. anderson R.J. Jr. and Reid R.O. (1983) An Empirical Analysis of Economic Strategies for Controlling Air Pollution, *Journal of Environmental Economics and Management*, 10, 112-24.
29. Shortle J.S. and Horan R.D. (2001) The Economics of Nonpoint Pollution Control, *Journal of Economic Surveys*, 15(3), 255-290.
30. Stavins R. (1998) What Can We Learn from the Grand Policy Experiment? Lessons from SO₂ Allowance Trading, *Journal of Economic Perspectives*, 3, 69-88.
31. Weitzman M. (1974) Prices Vs. Quantities, *Review of Economic Studies*, 41, 477-491.

Journals

1. Agricultural Economics
2. American Journal of Agricultural Economics (AJAE)
3. Development and Change
4. Ecological Economics
5. Energy Economics
6. Environment and Development Economics
7. Environmental and Resource Economics
8. Environmental, Development and Sustainability
9. Indian Journal of Agricultural Economics (IJAE)
10. Interdisciplinary Environmental Review
11. Journal of Environmental Economics and Management
12. Journal of Environmental Planning and Management
13. Journal of Forest Economics

Additional information (if any)

Student responsibilities

Attendance, feedback, discipline, guest faculty etc