

Rationale: The aim of this course is to provide an overview of the substantial amount of work on environmental and natural resource economics, which has been carried out over the past decade. Topics covered include: renewable resources; fisheries and forests; renewable resources; water; non-renewable resources; mining and energy; externalities and sustainable development, resource management; regional and global resource issues.

Prerequisite: Principles of Microeconomics

Course Objective: The objectives of this course are to introduce the students to natural resources and their economic values, the optimal use of these scarce resources, and how human, social and cultural reasons can influence the economic growth of the natural resources and their sustainability. It introduces students to the approaches used to manage, govern and sustain natural resources. The course will focus on the economic valuation of natural resources with an emphasis on their utilization, optimization and sustainability.

Intended Learning Outcomes: On the successful completion of this course, students will be able to:

1. apply economic analysis to the management of the natural resources;
2. be familiar with the techniques of evaluating non-market outcomes, the design and application of policy instruments, the relationship between local, regional and global aspects of natural resource problems, and the application of economic models to complex systems;
3. analyze theoretical and empirical research in natural resource economics; and
4. prepare a policy reports that develop knowledge and practical implementation of relevant economic theory in understanding and addressing a natural resource issue.

Course Content:

1. Introduction to Natural Resource and Environmental Economics:

What is environmental and resource economics; Emergence of and issues in environmental and resource economics; three themes (efficiency, optimality and sustainability); review of welfare economics.

2. Concept of Sustainability:

Economy-environment interdependence; environmental science issues (thermodynamics, recycling, the material balance principle, ecology, stability and resilience, ecological impact on humanity, biodiversity), drivers of environmental impact (IPAT Identity).

3. Property Rights, Externalities and Environmental Problems:

Property Rights and Environment, Property Rights and Efficient Market Allocations, Efficient Property Right Structures, Externalities and Market Failure (Public Goods, Imperfect Market Structures, An Efficient Role for Government in correcting market failure.

4. Pollution Control– Targets and instruments

i) Pollution flows, Pollution Stock and Pollution damage; The efficient level of pollution; Static model of flow pollution, efficient levels of emissions of stock pollutants, Pollution control by location of the emissions, Ambient Pollution standard, variable decay, Convexity and Non-convexity in damage and abatement cost functions, estimating the costs of abating pollution

ii) Criteria for choice of pollution control instruments; cost efficiency Vs. cost effectiveness pollution instruments, Instruments for achieving pollution abatement targets, A comparison of relative advantages of command and control, emission tax, emission abatement subsidy, and market permits.

ii) Difficulties in targeting pollution with limited information and uncertainty, Relative merits of pollution control instruments, transaction costs and environmental regulations.

5. Environmental Cost-benefit Analysis:

International welfare economics, cost-benefit analysis and the environment, conditions for inter temporal efficiency, markets and inter temporal allocation

6. Valuing the Environment: Different Valuation methods Dimensions of the value, the theory of environmental valuation, environmental valuation techniques- the travel cost method, contingent valuation and other methods

7. The Efficient and Optimal Uses of Natural Resources (Renewable)

Biological growth process, steady-state harvest, An open access fishery, dynamics of renewable resource harvesting, private property fishery, socially efficient resource harvesting, the current state of world forestry, characteristics of forest resource, socially and privately optimal multiple use plantation forestry, natural forests and deforestation.

8. The theory of optimal resource extraction: (non-renewable resources)

A simple optimal resource depletion model, the economy and its production function, the social welfare function and optimal allocation of natural resources, the optimal solution of resource depletion with extraction costs, oil extraction and global optimal consumption, two period nonrenewable resources model, Nonrenewable resource extraction in perfectly competitive markets, resource extraction in monopolistic market.

9. International Environmental Problem:

International environmental cooperation, Game theory analysis, International environmental agreements, international treaties, the acid rain pollution, the greenhouse effects.

10. The State of Environment in Bangladesh

Introduction – Soil Degradation – Water Pollution- Deforestation – Water Logging – Loss of Bio-Diversity – Air Pollution – Hazardous Pollutants – Ecological changes – Natural Disaster – Poverty and environment –A Critical Assessment of the environmental Policies of the Government of Bangladesh.

Main text

Perman, R., Ma, Y., McGilvery, J., Common, M., 'Natural Resource and Environmental Economics' 4th edition, Pearson Addison Wisely Publications, 2010.

Recommended Text:

1. Tietenberg, Tom, *Environmental and Natural Resource Economics*, Harper Collins College Publishers.
2. Boardman, A., Vining, A. and Weimer, D.1., 'Cost-Benefit Analysis: Concepts and Practice', Upper Saddle
3. Charles Kolstad, *Intermediate Environmental Economics*, Oxford University Press, 2nd edition, 2010.
4. Robert N. Stavins (ed.), *Economics of the Environment: Selected Readings*, W.W. Norton, 5th edition, 2005.