

**DISCIPLINE SPECIFIC ELECTIVE (DSE-EVS-01): ENVIRONMENTAL ECONOMICS**

**CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE**

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course
		Lecture	Tutorial	Practical/ Practice		
DSE-EVS-01: ENVIRONMENTAL ECONOMICS	4	2	0	2	Class XII pass	NA

**Learning objectives**

The Learning Objectives of this course are as follows:

- Appreciate critical linkages between fundamentals of environmental economics and environmental conservation
- Evaluate five megatrends involving climate, development, ecology, economy, and technology
- Inculcate market-based instruments in designing sustainable development approaches
- Gain insights into intricacies of economic valuation of biodiversity and ecosystems for making evidence-based conservation and development priorities
- Empower with the integrated use of economics & ecology in decision-making and law-making processes.

**Learning outcomes**

After the course, the students will be able to

- Use cost-benefit analysis and valuation techniques for environmental economics and natural resource management
- Implement economic and ecological concepts to influence society and policymakers for environmental and biodiversity conservation
- Act as a consultant to industries and government ministries aiming for sustainability
- Serve as a catalyst for developing ecoliterate industry and evolving sustainable policies
- Evolve ideas and economics-based techniques to design policy instruments for pollution control and management

## SYLLABUS OF DSE-EVS-01

Theory (02 Credits: 30 lectures)

### **UNIT – I Introduction to microeconomics (3½ Weeks) (07 lectures)**

Definition and scope of environmental economics; environmental economics versus traditional economics; brief introduction to major components of economy: consumer, firm and their interaction in the market, producer and consumer surplus, market failure, law of demand and supply, tangible and non-tangible goods; utilitarianism; Pareto optimality; compensation principle.

### **UNIT – II Environmental economics (4 Weeks) (08 lectures)**

Main characteristics of environmental goods; marginal analysis; markets and market failure; social benefit, costs and welfare functions; meaning and types of environmental values; measures of economic values; tangible and intangible benefits; Pareto principle or criterion; Hardin's Thesis of 'The Tragedy of Commons'; Prisoner's dilemma game; methods of abatement of externalities; social cost-benefit analysis; cost-effectiveness analysis.

### **UNIT – III Economic solutions to environmental problems (3½ Weeks) (07 lectures)**

Social costs and benefits of environmental programmes: marginal social benefit of abatement, marginal social cost of abatement; pollution control: policies for controlling air and water pollution, disposal of toxic and hazardous waste- standards vs. emissions charges, environmental subsidies, modelling and emission charges; polluter pay principles; pollution permit trading system.

### **UNIT – IV Natural resource economics (1½ Weeks) (03 lectures)**

Economics of non-renewable resources; economics of fuels and minerals; Hotelling's rule and extensions; taxation; economics of renewable resources; economics of water use, management of fisheries and forests; introduction to natural resource accounting.

### **UNIT –V Tools for environmental-economic policy (2½ Weeks) (05 lectures)**

Growth and environment; environmental audit and accounting, Kuznets curve, environmental risk analysis, assessing benefits and cost for environmental decision making; cost-benefit analysis and valuation: discounting, principles of Cost-Benefit Analysis, estimation of costs and benefits, techniques of valuation, adjusting and comparing environmental benefits and costs.

### Teaching and learning interface for theoretical concepts

To achieve the course objectives and match with the contents, a wide range of teaching and learning tools will be employed, including (a) Formal lectures; (b) Interactive sessions using visual aid; (c) Case study analyses; (d) Hypothetical scenario building; (e) Group discussion on key topics; and (f) documentary screening and critical analyses.

Practicals/Hands-on Exercises – based on theory (02 Credits: 60 hours)

1. Conduct cost-benefit analysis of any developmental project
2. Investigate underlying pattern of behavioural economics of selected environmental problem and suggest appropriate solution
3. Calculate energy requirements for decent living in a given country in the background of climate change
4. Determine the potential economic challenges of decarbonization policies and practices being adopted by a country of your choice
5. Apply LCA tools to calculate the energy of construction and manufacturing for appliances, buildings and infrastructure and assess sustainability of the given country
6. Analyze demand and supply curve using
7. Use demand or supply concept and provide empirical evidence on the effects of climate change on the macroeconomy
8. Compare and contrast the demand for and supply of EQ in developed and developing countries
9. Use Marginal Curve Analysis for a given pollution and determine the efficient level of pollution to maximize the net benefits of pollution
10. Determine the social cost of carbon (SCC) to minimize the climate change damages in the cost-benefit analysis of a given project that increase or reduce carbon emission
11. Calculate the value of damages incurred due to release of an additional tonne of carbon into the atmosphere
12. Use Demand for and supply of environmental quality (EQ) in the Environmental Kuznets Curve (EKC) hypothesis
13. Show the usefulness of (a) utility curve analysis, (b) indifference curve analysis, (c) production possibility frontier, (d) market failure or market equilibrium, and (e) Prisoners' dilemma game
14. Conduct an environmental audit of your institution and suggest strategies to improve its sustainability status

#### Teaching and learning interface for practical skills

To impart training on technical and analytical skills related to the course objectives, a wide range of learning methods will be used, including (a) laboratory practicals; (b) field-work exercises; (c) customized exercises based on available data; (d) survey analyses; and (e) developing case studies; (f) demonstration and critical analyses; and (h) experiential learning individually and collectively.

#### Essential/recommended readings

- Callan, S.J. and Thomas, J.M., 2013. Environmental economics and management: Theory, policy, and applications. Cengage learning.
- Hanley, N., Shogren, J.F. and White, B., 2016. Environmental economics: in theory and practice. Macmillan International.
- Hawken, P., Lovins, A.B. and Lovins, L.H., 2013. *Natural Capitalism: The Next Industrial Revolution*. Routledge.
- Kolstad, C.D. 2010. Environmental Economics. Oxford University Press.
- Thomas, J.M. & Callan, S.J. 2007. Environmental Economics. Thomson Learning Inc.
- Thampapillai, D.J. and Ruth, M., 2019. Environmental Economics: Concepts, Methods and Policies. Routledge.
- Tietenberg, T. and Lewis, L., 2018. Environmental and Natural Resource Economics. Routledge.

**Suggestive readings**

- Stahel, W.R. and MacArthur, E., 2019. *The Circular Economy: A User's Guide*. Routledge, NY, USA.
- Frodermann, L., 2018. *Exploratory Study on Circular Economy Approaches*. Springer, Fachmedien Wiesbaden.
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**Note:** Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.