

Discipline Specific Elective 2 (DSE-2): Economics of Climate Change and Natural Resources

Semester	Course title & Code	Credits	Duration (per week)			Eligibility Criteria	Prerequisite
			Lecture	Tutorial	Practical/ Practice		
III/V/VII	Economics of Climate Change and Natural Resources– ECON032	4	3	1	0	Passed Class 12th	Introductory Microeconomics (ECON001)

Learning Objectives

The Learning Objectives of this course are as follows:

- The objective of this course is to provide knowledge on the principles of governing and managing natural resources.
- This course introduces the conceptual and theoretical foundations of Resource Economics. In particular, the efficiency concepts for evaluating natural resource use and policies and potential sources of inefficiency in the context of forestry, fisheries, and exhaustible energy resources will be studied.
- Further, the basics of Economics of Climate change, its implications and policies.

Learning outcomes

The Learning Outcomes of this course are as follows:

- The students get familiarise with basic issues of sustainable resources allocation and economics of climate change.
- It will familiarize students with the Cost-Benefit Analysis, Challenges in estimating costs and benefits of greenhouse gas policies, the Environmental Kuznets curve, and Mitigation of climate change.
- The course will familiarize students with Sustainable development Goals SDGs, History of Convention UNFCCC, India's Intended Nationally Determined Contribution.

Syllabus

UNIT I: Mathematical Prerequisites (12 hours)

Difference equations; differential equations; phase plane analysis; dynamic optimization

Optimal extraction of a non-renewable resource, Optimal management of renewable resources -Fishery and Forestry

UNIT II: Energy Economics, Energy Transition, and Energy Security (12 hours)

Introduction to Basics of supply, demand, and prices, income elasticities, the economics of depletable resources, world oil markets, Pathways of energy transition from conventional to renewable energy sources, Policy instruments, Energy security, accessibility and A definition, and Energy poverty

UNIT III: The Economics of Climate change, Implications, and Policies (12 hours)

Cost-Benefit Analysis, Challenges in estimating costs and benefits of greenhouse gas policies, Environmental Kuznets curve, Mitigation of climate change, Sectoral impact of Climate change, climate change, and inequality, Policy responses, and instruments

UNIT IV: Sustainable Development (09 hours)

Concepts and Measurement, Weak and strong sustainability, Sustainable development Goals SDGs, History of Convention UNFCCC, India's Intended Nationally Determined Contribution

Recommended readings

- Harris, J. M., Roach, B., & Environmental, J. M. H. (2007). *The economics of global climate change. Global Development and Environment* Institute Tufts University.
- Pelling, M. (2010). *Adaptation to climate change: from resilience to transformation*. Routledge.
- Callan, Scott, and Janet Thomas. *Environmental Economics and Management: Theory, Policy and Applications*. 4th ed. Florence, KY: South-Western, 2006, chapter 3. ISBN: 9780324320671.
- Barrett, S. (1990) *The problem of global environmental protection*, Oxford Review of Economic Policy 6(1): 68–79
- Stern, N.(2007) *The Economics of Climate Change: The Stern Review*, Cambridge University Press.
- Stern, D. I. (2004). *The rise and fall of the environmental Kuznets curve*. World Development, 32(8), 1419-1439.
- Babiker, Mustafa, John Reilly, and Henry Jacoby. "The Kyoto Protocol and Developing Countries." *Energy Policy* 28, no. 8 (2000): 525-36.
- IPCC Climate Change 2014: Mitigation of Climate Change (in the press); <http://mitigation2014.or draft>
- Arnell, N. W., Brown, S., Gosling, S. N., Gottschalk, P., Hinkel, J., Huntingford, C., ... & Zelazowski, P. (2016). *The impacts of climate change across the globe: a multi-sectoral assessment*. *Climatic Change*, 134(3), 457-474.
- Roberts, J. T. (2001). *Global inequality and climate change*. *Society & Natural Resources*, 14(6), 501-509.
- Geoffrey Heal (2012). "Reflections—Defining and Measuring Sustainability" *Review of Environmental Economics and Policy* Vol. 6, No. 1 (winter 2012), p. 147–163.
- The environment write, 2009. "Defining sustainability: weak sustainability".

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.