Government Degree College, Baramulla (Autonomous)

Semester 8th **Major**

ENVIRONMENTAL SCIENCE
(For Honours courses)

COURSE CODE: EVSC3822M
COURSE TITLE: Environmental Economics, Policy, and Sustainable Development
CREDITS: (4+2) **Credit Hours (64 + 64)**

Course Objectives

1. To integrate concepts of economics, ecology, and sustainability for environmental decision-making.
2. To develop an understanding of economic valuation, environmental accounting, and green growth.
3. To familiarize students with national and global environmental policies and economic instruments.
4. To critically analyze environmental governance, climate policies, and market-based mechanisms.
5. To prepare students for careers in policy research, environmental consultancy, and sustainable development planning.

Learning Outcomes

By the end of this course, students will be able to:

1. Demonstrate knowledge of economic principles relevant to environmental management.
2. Apply valuation methods to assess natural resources and ecosystem services.
3. Evaluate and design policy instruments like carbon trading, pollution taxes, and PES schemes.
4. Critically assess Indian and global policies on climate change, biodiversity, and sustainable development.
5. Integrate economic, social, and ecological perspectives into sustainable policy frameworks.

Unit I: Foundations of Environmental and Ecological Economics

1. Evolution of environmental economics and ecological economics
2. Market failures – externalities, public goods, tragedy of commons
3. Sustainability economics – weak vs strong sustainability, steady-state economy (Herman Daly)
4. Environmental Kuznets Curve (EKC) and its critiques

Unit II: Valuation, Accounting, and Resource Economics

1. Valuation of ecosystem services – use, non-use, option values
2. Techniques – contingent valuation, hedonic pricing, travel cost, benefit transfer
3. Environmental accounting, natural capital, and green GDP
4. Economics of renewable and non-renewable resources – Hotelling's rule, fisheries and forestry models

Unit III: Policy Instruments and Governance Mechanisms

1. Regulatory instruments – standards, bans, EIA as policy
2. Market-based instruments – Pigovian taxes, subsidies, tradable permits, carbon markets
3. Payment for Ecosystem Services (PES) and REDD+
4. Policy mix – integrating regulation, incentives, and voluntary approaches

Unit IV: Environmental Policy and Sustainable Development

1. Environmental policy in India – NEP (2006), NAPCC, energy and water policies
2. Global policy frameworks – Kyoto Protocol, Paris Agreement, SDGs, CBD
3. Case studies – air pollution in Delhi, carbon trading in Europe, biodiversity offsetting in India, renewable energy policy in China
4. Future directions – circular economy, green finance, climate justice, and inclusive policy-making

Tutorial:

1. Evaluate a hypothetical hydroelectric project for cost benefit analysis.
2. Environmental Valuation Methods
3. Calculate optimal carbon tax for an industrial scenario to reduce CO_2 emissions.
4. Construct a simple sustainability index for a local urban area using indicators such as energy use, water availability, waste management, and health outcomes.
5. Analyze case study data (India or global) to discuss the Environmental Kuznets Curve (EKC).
6. Calculate "Green GDP" for a hypothetical state/region including pollution costs and resource depletion
7. Model sustainable harvest rate for a fishery or forest resource using MSY (Maximum Sustainable Yield).

Bibliography:

1. Daly, H.E., & Farley, J. (2010). Ecological Economics: Principles and Applications. Island Press.
2. Tietenberg, T., & Lewis, L. (2018). Environmental and Natural Resource Economics. Routledge.
3. Hanley, N., Shogren, J.F., & White, B. (2013). Introduction to Environmental Economics. Oxford University Press.
4. Kolstad, C.D. (2010). Environmental Economics. Oxford University Press.
5. Stern, N. (2007). The Economics of Climate Change: The Stern Review. Cambridge University Press.
6. Sankar, U. (2001). Environmental Economics. Oxford University Press, New Delhi.
7. Murty, M.N., & Gulati, S.C. (2004). Environmental Economics in Practice: Case Studies from India. Oxford University Press.
8. Katar Singh (2009). Environmental Economics: Theory and Applications. Sage Publications.
9. Gadgil, M., & Guha, R. (2006). Ecology and Equity: The Use and Abuse of Nature in Contemporary India. Penguin.
10. Planning Commission/NITI Aayog Reports on environment, natural resources, and sustainable development.