

ENVIRONMENTAL EDUCATION

LEARNING OBJECTIVES:

- To develop the basic knowledge of the environment
- To understand the role of environment in sustaining life
- To recognize the global environmental problems
- To understand the importance of forest and wildlife
- To develop the ability to apply multidisciplinary knowledge.

LEARNING OUTCOMES:

On successful completion of the course the learner will be able to:

- Recognize the environmental problem and their impacts on human and environment
- Apply the gained knowledge for environmental protection
- Demonstrate a multidisciplinary approach to deal with environmental issues
- Develop critical thinking skill and ability to integrate the disciplines related to environmental concerns.
- Formulate sustainable solutions towards local and global problems

Paper 1

Unit No.	Unit	Topics
1.	Introduction to Environment [4 Lectures]	<ul style="list-style-type: none"> • Multidisciplinary nature of environmental studies; Scope and importance; the need for environmental education; environmental ethics. • Ecology and environment, ecosystem, components of environment, food chains, food web and functions of ecosystem, energy flow in an ecosystem, ecological pyramid • Concept and classification of biomes, biogeochemical cycles, ecosystem preservation.
2.	Global environmental issues and environmental pollution [4 Lectures]	<ul style="list-style-type: none"> • Environmental pollution: definition, sources, causes, impacts, remedial measures; air, water, soil, noise and radiation pollution • Solid Waste Management- Control measures of urban and industrial waste, Waste segregation, E-waste, Biomedical waste • Pollution Case Studies: Delhi Air Pollution and public health issues, Ganga Action Plan, Bhopal Gas Tragedy • Stratospheric ozone depletion, El Nino, Acid rain. • Disasters and disaster management; Special reference to floods, earthquakes, cyclones, landslides
3.	Biodiversity and Conservation [2 Lectures]	<ul style="list-style-type: none"> • Biodiversity: Definition, Levels of biodiversity, biogeographic zones of India, global biodiversity hotspots, Keystone species, Values of biodiversity. Endangered and endemic species of India, IUCN Red list criteria and categories • Threats to biodiversity: Habitat loss, poaching of wildlife, Conservation of biodiversity: In-situ and Ex-situ methods • Case Studies: Project Tiger, Deforestation in Amazon, Reintroduction of Asiatic Lions in Kuno National Park, India; reintroduction of Cheetah in India
4.	Climate Change, its impact and mitigation [2 Lectures]	<ul style="list-style-type: none"> • Green house effect, Global warming; Definition, scope and facts of climate change, Impacts of global climate change, Climate change adaptation and mitigation • National Action Plan on Climate Change (NAPCC), National Clean Air Programme (NCAP), The Net Zero Commitment • UN Initiatives and International Agreements: Montreal Protocol; UNFCCC and Kyoto Protocol (COP 3), Paris Climate Summit

SUGGESTED TEXT BOOKS/ READING MATERIALS:

1. Mitra, A. K and Chakraborty, R., Introduction to Environmental Studies, Book Syndicate, 2016.
2. Basu, M. and Xavier, S., Fundamentals of Environmental Studies, Cambridge University Press, 2016.
3. Enger, E. and Smith, B., Environmental Science: A Study of Interrelationships, Publisher: McGraw-Hill Higher Education; 12th edition, 2010.

Suggested readings:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India Univ. of California Press.
3. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
4. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
5. Agrawal, K M, Sikdar, PK and Deb, SC, A Text book of Environment, Macmillan Publication, 2002.
6. Richard T Wright, Environmental Science: Towards a Sustainable Future, Prentice-Hall Inc., 2008.

Paper 2

Unit No.	Unit name	Topics
1.	Energy Resources [2 Lectures]	Renewable and non-renewable resources- solar, wind, geothermal, tidal, OTEC, hydro- and SHP, fossil fuels, and nuclear energy.
2.	Environmental Management [6 Lectures]	<p><u>Policies-</u></p> <ul style="list-style-type: none"> • Concept and objectives, the evolution of Indian environmental policy. • UN Conferences and commissions- UNCHE, WCED & sustainable development, UNCED, WSSD, Rio+20. • International agreements: CLRTAP, Basel Convention, Convention on Biological Diversity (CBD), CITES, Cartagena Protocol, TRIPS, Vienna Convention, concept of carbon trading. • International Organizations- FAO, UNEP, UNDP, IUCN. • National organization- MoEFCC, PCBs. <p><u>Environment Laws-</u></p> <ul style="list-style-type: none"> • Wildlife Protection Act, 1972 • Water (Prevention and Control of Pollution) Act, 1974 & Water Cess Act 1977 • Forest Conservation Act, 1980. • Air (Prevention & Control of Pollution) Act, 1981. • Environment Protection Act, 1986 (with subordinate Acts and Rules). • Biodiversity Act, 2002. • Role of National Green Tribunal. • Environmental movements: Chipko, Silent Valley, Bishnoi, Narmada Bachao Andolan, Nava Danya. <p><u>Practices-</u></p> <ul style="list-style-type: none"> • Developing Environmental standards- MINAS, NAAQS, BIS, WHO, AQI, and Emission standards. • Practices- Environmental audit & ISO 14000 certification audit. • Earth Hour; carbon sequestration, Green Buildings • EIA (concept, objectives, principles, generic process, the concept of EIA in India). • Environmental and health application of IT and AI.
2.	Sustainable Development [2 Lectures]	<ul style="list-style-type: none"> • Sustainability: Definition and emergence of the concept of sustainable development • Need and relevance in the contemporary society, principles of sustainable development, SDGs pertaining to environmental issues • Policy Initiatives for Sustainable Development in India (Swachh Bharat mission, Beti Bacho Beti Padhao)
3.	Sanitation and Health [2 Lectures]	<ul style="list-style-type: none"> • Water, Sanitation and Hygiene (WASH): Concept, Meaning, Principles, and Practices

		<ul style="list-style-type: none"> • Sanitation: Meaning, Concept, and Applications. Institutional Sanitation. • Health: Concept and Meaning. Determinants of Health and Well-being. Public Health and Community Health. • Human population growth: impacts on environment, human health and welfare, Family Welfare Programme (FWP) • Hygiene: Concept, Meaning, Principles, and Importance. Types of Hygiene: Personal, Food, and Community. Standard Hygiene Practices.
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1. Mitra, A. K and Chakraborty, R., Introduction to Environmental Studies, Book Syndicate, 2016.
2. Basu, M. and Xavier, S., Fundamentals of Environmental Studies, Cambridge University Press, 2016.
3. Enger, E. and Smith, B., Environmental Science: A Study of Interrelationships, Publisher: McGraw-Hill Higher Education; 12th edition, 2010.

Suggested readings:

1. Harris, P. G. (Ed.). (2014). Routledge Handbook of global environmental politics. New York: Routledge.
2. Divan, S., & Rosencranz, A. (2001). Environmental law and policy in India. Oxford University Press India.
3. Sengupta, R. 2001. Ecology and Economics: An approach to sustainable development. Oxford University Press.
4. Glasson, J., & Therivel, R. (2013). Introduction to environmental impact assessment. Routledge.
5. Twidell, J. (2021). Renewable energy resources. Routledge.
6. Kruger, P. (2006). Alternative energy resources: the quest for sustainable energy. Hoboken: Wiley.