

107: Environmental Science

Theory Credits: 3

Lab Credits:0

Objectives :

To develop understanding of importance of environmental science, problems of pollution, loss of forest, solid waste disposal, degradation of environment, issues like economic productivity and national security, global warming, depletion of ozone layer and loss of biodiversity. To develop clear understanding of environmental concerns and to follow sustainable development practices.

Sr. No.	Topic Name	No. Of Hrs
01	The Multidisciplinary nature of environmental studies Definition, scope and importance Need for public awareness	03
02	Natural Resources Natural resources and associated problems a. Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams & their effects on forests & tribal people. b. Water resources: Use and over-utilization of surface and	07

	<p>ground water, floods, draught, conflicts over water, dams benefits and problems</p> <p>c. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies</p> <p>d. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies</p> <p>e. Energy resources: growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies</p> <p>f. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification</p> <p>g. Role of an individual in conservation of natural resources</p> <p>h. Equitable use of resources for sustainable lifestyles</p>	
03	<p>Ecosystems</p> <p>a. Concept of an ecosystem</p> <p>b. Structure and function of an ecosystem</p> <p>c. Producers, consumers and decomposers</p> <p>d. Energy flow in the ecosystem</p> <p>e. Ecological succession</p> <p>f. Food chains, food webs and ecological pyramids</p> <p>g. Introduction, types, characteristic features, structure and function of the following ecosystem – Forest ecosystem, Grassland ecosystem, Desert ecosystem, aquatic ecosystems (ponds, rivers, oceans, estuaries)</p>	05
04	<p>Biodiversity and its conservation</p> <p>Introduction – Definition: genetic, species and ecosystem diversity</p> <p>Bio-geographical classification of India</p> <p>Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, Biodiversity at global, National and local levels, India as a mega-diversity nation, Hot-spots of biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity</p>	05
05	<p>Environmental Pollution</p> <p>Definition Causes, effects and control measures of:</p> <p>a. Air pollution</p> <p>b. Water pollution</p> <p>c. Soil Pollution</p>	05

	<p>d. Marine Pollution</p> <p>e. Noise Pollution</p> <p>f. Thermal pollution</p> <p>g. Nuclear hazards</p> <ul style="list-style-type: none"> • Solid waste Management: causes, effects and control measures of urban and industrial wastes • Role of an individual in prevention of pollution of pollution • Pollution case studies • Disaster management: floods, earthquake, cyclone and landslides 	
06	<p>Social Issues and the environment</p> <p>From Unsustainable to sustainable development, Urban Problems related to energy, Water conservation, rainwater harvesting, watershed management, Resettlement and rehabilitation of people, its problems and concerns. Case studies, Environmental ethics: Issues and possible solutions, Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies, Wasteland reclamation, Consumerism and waste products, Environmental Protection Act, Air (Prevention and control of pollution) Act, Water (Prevention and control of pollution) Act, Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness</p>	07
07	<p>Human Population and the Environment</p> <p>Population growth, variation among nations, Population explosion – family welfare Programme, environment and human health, human rights, value education, HIV / AIDS, women and child welfare, role of information technology in environment and human health, Case studies</p>	06
08	<p>Field Work</p> <p>Visit to a local area to document environmental assets – river/forest/grassland/hill/mountain, visit to local polluted site – urban/rural/Industrial/Agricultural</p> <p>Study of simple common plants, insects, birds, Study of simple ecosystems –pond, river, hill slopes etc (field work equal to 5 lecture hrs)</p>	07
	Total	45

Reference books:

1. Environmental Biology by Agarwal, KC
2. The Biodiversity of India by Bharucha Erach,
3. Hazardous Waste Incineration by Brunner R.C.
4. Environmental chemistry by De A.K. Wiley
5. Environmental Protection and laws by Jadhav H & Bhosale V.M
6. Environmental Science by Miller T.G Jr.
7. Environmental Science systems and solutions by McKinney ML

