21CPHY361 ENVIRONMENTAL STUDIES AND DISASTER MANAGEMENT

Source:
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Hours Per Week :

L	T	P	C
1	-	2	2

Total Hours :

L	T	P
15	-	30

Course Description and Objectives:

This course imparts knowledge on the basics of environmental studies, environmental pollution,environmental hazardsand disaster management.

Course Outcomes:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes
1	Awareness about changes in environment and their implications in sustainable management of mineral, water and energy resources and conservation of biodiversity
2	Initiate and support environment protection measures and management of natural disasters by creating awareness and promoting government initiatives and programs

SKILLS:

- ✓ *Identify solutions to environment and development issue, using planning, analysis, modeling and new approaches*
- ✓ *Acquire field work technique to study, observe and prepare documents, charts, PPTs, models pertaining to climate change, global warming, acid rain, ozone layer depletion*

ACTIVITIES:

- *Estimation of total dissolved solids, Hardness, dissolved oxygen, BOD and COD in waste water sample*
- *Heavy metals analysis in sludge and waste water sample*

UNIT - 1

Multidisciplinary nature of environmental studies: Scope and importance. Natural Resources: Renewable and non-renewable, Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining. b) Water resources: Use and over-utilization of surface and ground water, conflicts over water, dams- effects on tribal people and forests, benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, case studies. e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies. f) Land resources: Land as a resource, land degradation, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles

UNIT - 2

Biodiversity and its conservation: Introduction, definition, genetic, species & ecosystem diversity and bio-geographical classification of India. 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. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ

UNIT - 3

Environmental Pollution: Definition, cause, effects and control measures of a) Air pollution b) Water pollution c) Soil pollution d) Marine pollution e) Noise pollution f) Thermal pollution g) Nuclear hazards. Solid Waste Management: causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Case studies

UNIT - 4

Disaster management: Natural Disasters, nature, types and their effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves; Man Made Disasters- Nuclear, chemical, biological, fire disasters - building, coal, forest, and oil, Accidents - road accidents, rail, air, and sea accidents. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community- based organizations and media. Central, state, district and local administration; Armed forces, Police and other organizations in disaster response

UNIT - 5

Social Issues and the Environment: Unsustainable to Sustainable development, Environment Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. HIV/AIDS. Role of Information Technology in Environment and human health

LABORATORY EXPERIMENTS

LIST OF EXPERIMENTS

1. Collection, processing and storage of effluent samples
2. Determination of chemical oxygen demand in waste water sample
3. Estimation of dissolved oxygen in waste water sample
4. Determination of total dissolved solids in waste water sample
5. Analysis of temporary hardness of waste water sample by titration
6. Analysis of total hardness of waste water sample by titration
7. Preparation of sludge / waste water sample for analysis of heavy metals
8. Estimation of heavy metals in sludge / waste water by Atomic Adsorption Spectrophotometer (AAS)
9. Determination of sound level by using sound level meter
10. Estimation of species abundance of plants
11. Estimation of respirable and non – respirable dust in air by using dust sampler
12. Study of transpiration and water balance in plants. Assessment of chlorophyll content in plants
13. Visit to in-situ or ex-situ conservation center / Social Service Organization / Environmental Education Centre
14. Information and Communication Technology (ICT) in Environmental Science
15. Visit to a local polluted site – observations and remedial measures

REFERENCES:

1. Bharucha, E. 2005. Text book of Environmental Studies for undergraduate courses University Grants Commission, New Delhi
2. Anjaneyalu, Y. 2004. Introduction to Environmental Science. BS Publications, Hyderabad, A.P. India