BICOCE / BITOCE 301

ENVIRONMENTAL STUDIES

Credits	***: 4***
Lecture periods/week	***: 3***
Practical	***: 1***

Unit I **15 Periods**

Introduction: The Multidisciplinary nature of environmental studies: Definition, scope and importance - Need for public awareness

Natural Resources: Renewable and non-renewable resources: Use And over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people - Water resources: utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems Mineral resources: Use and exploitation, environmental effects if extracting and using mineral resources, case studies- Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer – pesticide problems, water logging, salinity, case studies - Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification - Role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles

Unit –II **15 Periods**

Eco – Systems: Concept of an ecosystem - Structure and function of an ecosystem - Producers, consumers and decomposers - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following ecosystem - Forest ecosystems - Grassland ecosystems- Desert ecosystems - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Biodiversity and its conservation: Introduction: Definition: genetic, species and ecosystem diversity - Biographical 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 - Hotspots 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 conservation of biodiversity

Unit III **15 Periods**

Environmental Pollution: Definition - Causes, effects and control measures of - Air pollution - Water pollution - Marine pollution - Noise pollution - Nuclear hazards - Solid waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution - Pollution case studies - Disaster Management: Floods, earthquakes, cyclones and landslides

Unit IV **15 Periods**

Social issues and the Environment: From unsustainable to sustainable development - Urban problems related to energy - Water conservation, rainwater harvesting, watershed management - 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 - Environment Protection Act - Air (Prevention and Control of Pollution) Act – Wildlife Protection Act - Forest Conservation Act - Issues involved in enforcement of environmental legislation - Public awareness - Environmental Impact Assessment

Human Population and the Environment: Population growth, variation among nations - Population explosion – Family Welfare Programme - Environment and human health - Human Rights - HIV / AIDS - Women and Child Welfare - Role of Information Technology in Environment and human health - Case Studies.

Field Work: A guided field visit to one of the following natural ecosystem. Visit to a local area to document environmental assets –river / forest / grassland / hill / mountain - Visit to a local polluted site – Urban / Rural / Industrial / Agricultural - Study of common plants, insects, birds - Study of simple ecosystems – pond, river, hill slopes, etc

Text Books

1. A Hand Book of Environmental Studies UG Course Material – Compiled by Faculty of School of Civil Engineering, SASTRA.
2. Bharucha Erach (Ed), (2004), Text Book for Environmental Studies, UGC, New Delhi.

Reference:

1. Anjaneyulu Y, (2004), Introduction to Environmental Science, BS Publications, Hyderabad.
2. Bharucha Erach, Textbook of Environmental Studies for Undergraduate Courses, University Press.
3. Daniel B, Botkin et.al, (2000), Environmental Science, John Wiley & Sons
4. Meenakshi. P, Elements of Environmental Science and Engineering, Prentice – Hall of India, New Delhi
5.William P,Cunnigham et.al, (2002), Principles of Environmental Science, Tata McGraw Hill Edition