

## ENVIRONMENTAL STUDIES – I

(No. of credits = 2; No. of contact hours = 30)

Semester – I (for B.Com.)

**Objectives:** The course envisages that all the under graduates coming out of our University system are aware of our natural resources, ecosystems and their linkages to society, livelihood, environment and conservation. This theoretical learning shall be supported by the actual field visits.

### **Unit 1: The Multi-Disciplinary Nature of Environmental Studies** (2 hours)

Definition, Scope and Importance; need for public awareness

### **Unit 2: Natural Resources:** (8 hours)

- Renewable and Non-Renewable resources: natural resources and associated problems
  - a) Forest Resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
  - b) Water Resources: use and over-exploitation of surface and ground water; floods, droughts, conflicts over water, dams-benefits and problems.
  - c) Mineral Resources: use and exploitation, environmental effects of extracting and using mineral resources; case studies related to mining and its effect on siltation and loss of biodiversity.
  - d) Food Resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity; case studies.
  - e) Energy Resources: growing energy needs, renewable and non-renewable energy sources, use of alternative energy sources, case studies
  - f) Land Resources: land as a resource, land degradation, man-induced landslides, coastal erosion, soil erosion and desertification.
- Role of an individual in conservation of natural resources.
- Equitable use of resources for sustainable lifestyles.

### **Unit 3: Ecosystems** (6 hours)

Concept of an ecosystem, structure and functions of ecosystems; producers, consumers and decomposers, energy flow in the ecosystem, ecological succession, food chains, food webs and ecological pyramids.

Introduction, types, features, structure and functions of the following ecosystems: forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem (ponds, streams, lakes, rivers, oceans, coastal zone, estuaries).

### **Unit 4: Biodiversity and its Conservation** (8 hours)

Introduction, definition, genetic, species and ecosystem diversity; bio-geographical classification of India; value of biodiversity - consumptive use, productive use, social, ethical, aesthetic and option values; biodiversity at global, national, regional and local levels; India as a mega-diversity nation; hotspots of biodiversity; threats to biodiversity - habitat loss, poaching of wildlife, man-wildlife conflicts, bio-invasion, and over exploitation; endangered and endemic species of India (at least 5 examples of animals and plants each); conservation of biodiversity- in-situ and ex-situ conservation, role of biotechnology in conservation of biodiversity.

### **Unit 5: Field visits** (6 hours)

Visit to a local area to document environmental assets - river/ forest/ grassland/ hill/ mountain; study of common plants, insects, birds; study of simple ecosystems-pond/ river/ hill slopes, etc. A report of field visit(s) to be maintained.

### **Recommended Readings**

- Agarwal K.C. (2001): Environmental Biology, Bikaner, Nidi
- Bharucha E.: The Biodiversity of India, Ahmedabad, Mapin
- Bharucha E.: Textbook of Environmental Studies. Orient BlackSwan
- Brunner R.C. (1989): Hazardous Waste Incineration, New York, McGraw-Hill
- Chatwal G.R. & Sharma H. (2005): A Textbook of Environmental Studies, Mumbai, Himalaya
- Clark R.S.: Marine Pollution, Oxford, Clarendon
- Cunningham W.P., Cooper T.H., Gorani E. & Hepworth M.T. (2001): Environmental Encyclopaedia, Mumbai, Jaico.
- De A.K.: Environmental Chemistry, Wiley
- Desai R.J. (2003): Environmental Studies, Mumbai, Vipul
- Gleick H.P. (1993): Water in Crisis, Stockholm Env. Institute, OUP
- Hawkins R.E.: Encyclopaedia of Indian Natural History, Mumbai, BNHS
- Heywood V.H. & Watson R.T. (1995): Environment Protection and Laws, Mumbai, Himalaya
- Jadhav H. & Bhosale V.M. (1995): Environment Protection and Laws, Mumbai, Himalaya
- McKinney M.L. & Schoel R.M. (1996): Environment Science, Systems and Solutions, Web Enhanced Edition.
- Mhaskar A.K.: Matter Hazardous, Techno-Science Publications
- Miller T.G. Jr.: Environmental Science, Wadsworth
- Odum E.P. (1971): Fundamentals of Ecology, Philadelphia, W.B. Saunders
- Rao M.N. & Datta A.K. (1986): Waste Water Treatment, Oxford & IBH
- Santra S.C. (2004): Environmental Science, Kolkata, Central Book Agency
- Sharma B.K. (2001): Environmental Chemistry, Meerut, Goel Publishing House
- Townsend C., Harper J. & Begon M.: Essentials of Ecology, Blackwell Science
- Trivedi R.K.: Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol.1 & 2, Enviro Media.
- Trivedi R.K. & P.K. Goel: Introduction to Air Pollution, Techno-Science Publications
- Wagner K.D. (1998) Environmental Management, Philadelphia, W.B. Saunders

### **Magazines**

- Down to Earth, Centre for Science & Environment
- Survey of the Environment published by The Hindu

### **Eresource**

<http://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf>

## ENVIRONMENTAL STUDIES – II

(No. of credits = 2; No. of contact hours = 30)

Semester – II (for B.Com.)

**Objectives:** The course envisages that all the under graduates coming out of our University system are aware of our natural resources, ecosystems and their linkages to society, livelihood, environment and conservation. This theoretical learning shall be supported by the actual field visits.

### **Unit 1: Environmental Pollution** (7 hours)

Definition, causes, effects and measures to control air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear hazards; waste – types, causes, effects; waste management –solid, sewage and effluents; measures to control industrial and urban wastes; role of an individual in prevention of pollution; pollution case studies (Bhopal gas tragedy and mining); disaster mitigation and management-floods, droughts, earthquakes, landslides, cyclones, Tsunami.

### **Unit 2: Social issues and the Environment** (8 hours)

From unsustainable to sustainable development; urban problems related to energy; water conservation, rainwater harvesting, watershed management; resettlement and rehabilitation of people - problems and concerns, case studies; environmental ethics - issues and concerns; climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies; wasteland reclamation; consumerism and associated waste products; Objectives and scope of Environment (Protection) Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Forest Conservation Act, Wildlife Protection Act, Forest Rights Act and Biodiversity Act; Issues involved in enforcement of environmental legislation; public awareness.

### **Unit 3: Human Population and the Environment** (5 hours)

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.

### **Unit 4: Tourism and Environment** (4 hours)

Definition and typology of tourism; mass tourism and environment - aspects of degradation and exploitation, physical and social impacts; examples at local, regional, national and international levels. Sustainable tourism.

### **Unit 5: Field visit** (6 hours)

Visit to a local polluted site - urban/rural/ industrial/ agricultural and waste treatment plant(s)/sustainable tourism site(s). A report of field visit to be maintained.

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