

## **Syllabus for Undergraduates**

### **Unit 1: Environmental Science and Ecosystem08**

- a. Definition of Environmental Science, multidisciplinary nature, Objective, scope and importance.
- b. Concept of an ecosystem, structure and function, energy flow, ecological succession, food chains, food webs, ecological pyramids.
- c. Introduction, types, characteristic features, structure and function of the following ecosystem:
- Forest ecosystem
  - Grassland ecosystem
  - Desert ecosystem
  - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

### **Unit 2: Natural Resources and Biodiversity**

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- a. Renewable and non-renewable resources.
- b. Natural resources and associated problems:
- **Forest resources:** Use and over-exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people.
  - **Water Resources:** Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams – benefits and problems, water conservation, rainwater harvesting, watershed management.
  - **Mineral Resources:** Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
  - **Food Resources:** World food problems, Changes in land use by agriculture and grazing, Effects of modern agriculture, Fertilizer/ pesticide problems, Water logging and salinity
  - **Energy Resources:** Increasing energy needs, Renewable/ non renewable, Use of Alternate energy sources, urban problems related to energy, Case studies
  - **Land resources:** Land as a resource, land degradation, man-induced land-slides, soil erosion and desertification, wasteland reclamation
- c. Role of an individual in conservation of natural resources, equitable use of resources for sustainable lifestyles.

- d. Definition of biodiversity, levels of biodiversity, value of biodiversity, threats to biodiversity (habitat loss, poaching of wildlife, man-wildlife conflicts).
- e. Biodiversity at global, national and local levels, India as a biodiversity nation, biogeographical classification of India, hotspots of biodiversity.
- f. Endangered and endemic species of India.
- g. Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

### **Unit 3: Environmental Pollution**

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- a. Definition, causes, effects and control measures of Air Pollution, water pollution, soil pollution, marine pollution noise pollution, thermal pollution, nuclear hazards.
- b. Solid waste Management: causes, effects and control measures of urban and industrial wastes
- c. Role of an individual in prevention of pollution, pollution case studies, pollution case studies

### **Unit 4: Important Environmental and Social Issues, Management and Legislation<sup>14</sup>**

- a. Climate change, global warming, acid rain, Ozone layer depletion, nuclear accidents and holocaust. Case studies.
- b. Sustainable development, Resettlement and rehabilitation of people (its problems and concerns, case studies), Environmental ethics (issues and possible solutions), consumerism and waste products.
- c. Disaster management: floods, earthquake, cyclone and landslides.
- d. Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act,
- e. Issues involved in enforcement of environmental legislation, Public Awareness
- f. Population growth (variation among nation), 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 5: Field work**

- a. Visit to a local area to document environmental assets-river/ forest/ grasslands/ hill /mountain.
- b. Visit to a local polluted site- Urban/ Rural/ Industrial/ Agricultural
- c. Study of common plants, insects, birds
- d. Study of simple ecosystems- pond, river, hill slopes, etc.

## **References**

- 1. Joseph K. & Nagendran R.: Essentials of Environmental studies; Pearson Edition
- 2. Santra S. C., Environmental Science; Central Book Agency.
- 3. Dhameja, S. K.: Environmental Studies; Katson books.
- 4. Srivastava Smriti: Environmental Studies; Katson books.
- 5. Deswal, S. & Deswal A.: A Basic Course In Environmental Studies; Dhanpat Rai & Co.