

## **SYLLABUS**

### **Ability Enhancement Compulsory Course**

**(All Undergraduate Degree Programmes under Gauhati University)**

#### **ENV-AE-2014: Environmental Studies**

**Total Marks: 100 (External: 80 + Internal: 20)**

**Nature of Course: AECC**

**Streams – B.Sc (2<sup>nd</sup> semester)**

#### **Unit-I: Introduction to Environmental Studies**

- Multidisciplinary nature of environmental studies
- Scope and importance
- Concept of Sustainable development

#### **Unit-II: Ecosystems**

• What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food web and ecological succession. Case studies of the following ecosystems:

- a) Forest ecosystem
- b) Grassland ecosystem
- c) Aquatic ecosystem (ponds, streams, lakes, rivers)

#### **Unit-III Resources: Types, Renewable and Non-renewable Resource**

Land resources: Land use change; land degradation, soil erosion and desertification.

Forest resources: Deforestation: Causes and impacts due to mining, Construction of big dams and their effects on forests and people.

Water resources: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & interstate: Indo-China, Indo-Bangladesh, Cauveri disputes)

Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, and case studies - coal mining, crude oil extraction.

#### **Unit-IV: Biodiversity and Conservation**

• Levels of biological diversity; genetic, species and ecosystem diversity; Bio geographic zones of India, Biodiversity patterns and global biodiversity hot spots.

India as a mega-biodiversity nation; Endangered and endemic species of India.

Threats to biodiversity: Habitat loss, poaching of wildlife, man wildlife conflicts, biological invasions; conservation of biodiversity

: In-situ and Ex situ conservation of biodiversity.

Ecosystem and diversity services: Ecological, economic, social, ethical, aesthetic and informational value.

### **Unit-V: Environmental Pollution**

- Environmental pollution: Types, causes, effects and controls; Air water, soil and noise pollution.

Nuclear hazards and human health, risks

Solid waste management: Control measures of urban and industrial waste.

- Pollution case studies - Bharalu River, Deepor Beel, Kolong River.

### **Unit-VI: Environmental Policies & Practices**

- Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture.

Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Forest Conservation Act. International agreements, policies and treaties; Montreal and Kyoto Protocols and Convention on Biological Diversity (CBD), CITES.

- Nature reserves, tribal populations and rights, and human wildlife conflicts in the context of Assam.

### **Unit-VII: Human Communities and the Environment**

- Human population growth: Impacts on environment, human health and welfare.

Resettlement and rehabilitation of project affected persons; case studies.

Disaster management: floods, earthquake, cyclones and landslides.

Environmental movements: Chipko, Silent valley, Narmada Bachao, Bishnois of Rajasthan.

Environmental ethics: Role of India and other religions and cultures in environmental conservation.

Environmental communication and public awareness, case studies (CNG electric vehicles, green energy, waste minimization)

### **Unit-VIII: Field Work**

~ Visit to an area to document environmental assets: river/forest/flora/fauna, etc.

Visit to a local polluted site - Urban/Rural/Industrial/Agricultural.

Study of common plants, insects, basis and basic principles of identification.

- Study of simple ecosystems pond, river, and stream.