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

No. of Credits: 4 **No. of hours: 60**

(Approved in the Academic Council 08-11-2019)

Unit1: Introduction to Environmental Studies

- Multidisciplinary nature of environmental studies;
- Scope and importance;
- Concept of sustainable development

(3 lectures)

Unit 2: 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 ecosystems (ponds, streams, lakes, rivers)
  d) Mountain ecosystem

(8 lectures)

Unit 3: Natural Resources: Types, Renewable and Non-renewable Resources

- Land resources : landuse 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 & inter-state: Indo-China, Indo-Bangladesh, Cauveri disputes) .
- Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies – coal mining, crude oil extraction.

(8 lectures)

Unit 4: Biodiversity and Conservation

- Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic 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.

(8 lectures)

Unit 5: 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

(8 lectures)

Unit 6: 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; Water (Prevention and control of pollution) Act; Wildlife Protection 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

(8 lectures)

Unit 7: 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 Indian and other religions and cultures in environmental conservation.
- Environmental communication and public awareness, case studies (CNG, electric vehicles, green energy, waste minimization)

(9 lectures)

Unit 8: 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, birds and basic principles of identification.
- Study of simple ecosystems- pond, river, stream

(Equivalent to 8 lectures)

Suggested Readings:

1. Bharucha Erach : Text book on Environmental Studies, UGC, New Delhi
2. Carson, R 2002. Silent Spring. Houghton Mifflin Harcourt.
3. De A.K.: Environmental Chemistry, Wiley Eastern Ltd.
4. Kaushik Anubha and C.P.Kaushik : Perspective in Environmental Studies, New Age International
5. Rajagopalan, R. (2018). Environmental Studies. (3rd Edition) Oxford University Press
6. S. C. Santra (2011): Environmental Science, New Central Book Agency