

ENVIRONMENTAL STUDIES

(Common to EEE, CE, ME, CSE during I B.Tech., I Semester)

(Common to IT, AE, ECE during I B.Tech., II Semester)

Course Code(s): CEIT4, MEIT4, CSIT4, EE1T4, IT2T4, AE2T6, EC2T4

Credits: 3

Lecture: 3 periods/week

Internal assessment: 30 marks

Semester end examination: 70 marks

Course Objectives:

- To develop an awareness, knowledge, and appreciation for the natural environment.
- To understand different types of ecosystems exist in nature.
- To know our biodiversity.
- To understand different types of pollutants present in Environment.
- To know the global environmental problems.

Course Outcomes:

The student will be able to

- Develop an appreciation for the local and natural history of the area.
- Hope for the better future of environment in India which is based on many positive factors like Biodiversity, successive use of renewable energy resources and other resources, increasing number of peoples movements focusing on environment.
- Know how to manage the harmful pollutants.
- Gain the knowledge of Environment.
- Create awareness among the youth on environmental concerns important in the long term interest of the society

UNIT – I

Natural Resources:

A)Forest resources – Use and over – exploitation, deforestation, case studies – Timberextraction – Mining, dams and other effects on forest and tribal people.

Water resources - Use and over utilization of surface and ground water – Floods, drought,conflicts over water, dams - benefits and problems.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosionand desertification.

B)Energy resources: Renewable and non-renewable resources-Natural resources

and associated problems Growing energy needs, renewable and non-renewable energy sources useof alternate energy sources. Case studies.

Mineral resources: Use and exploitation problems, environmental effects of 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. Organic Farming, Bio fertilizers and Bio-pesticides

UNIT – II

A)Ecosystems:

Definition, Scope and importance, 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, Flow of energy, Bio-geochemical cycles, Bio-magnification, Ecosystem values, Services and carrying capacity.

B)Biodiversity and its conservation:

Introduction - Definition: genetic, species and ecosystem diversity. Biogeographical classification of India, India as a mega-diversity nation, Hot-spots of biodiversity, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic, option values and ecosystem service values. 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

A)Environmental Pollution: Definition, Cause, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, Nuclear hazards

B)Solid waste Management: - classification and characters of solid waste, factors affecting waste generation, collection and disposal of solid waste. E- waste and management. Role of an individual in prevention of pollution. – Pollution case studies.

UNIT – IV

A)Global Environmental problems and Global efforts:

Green house effect, Green house gases, Global warming, Climate change and their impact on human environment, ozone layer depletion. International conventions / protocols: Earth summit, Kyoto protocol & Montreal protocol.

B)Towards Sustainable Future: From Unsustainable to Sustainable development, Population and its explosion, Urban problems related to energy, Consumerism and waste products, Role of IT in Environment and human health. Value Education. HIV/AIDS, Environmental ethics, Concept of green buildings and Clean Development Mechanism.

UNIT - V

A)Environmental Impact Assessment & Management plans, Environmental

Law: Definition of impact, Classification of impacts, Impacts of different components such as: human health, resources, air, water, flora & fauna. Environment

management plans (EMP): Technological solutions for pollution control, Green-belt-development, Rain water harvesting, Remote sensing and GIS methods. Environmental law (Air, Water, Wild life, Forest Acts): Objectives of Acts, Institutional arrangements for Implementation and Regulation.

B)Field work:

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.

Learning Resources

Text Books:

- Erach Bharucha, 2010 “Text Book of Environmental Studies”, University Grants Commission, Universities Press (India) Pvt.Ltd., Hyderabad
- Text Book of Environmental Sciences and Technology by M. Anji Reddy, BS Publications.

Reference:

- Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
- Text Book of Environmental Science and Engineering by G.Tyler Miller Jr,2006 Cengage learning
- Text Book of Environmental Studies from Crisis to Cure by R. RajaGopalan.
- Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada
- **e-learning resources:**
- <http://nptel.ac.in/courses.php>
- <http://jntuk-coeerd.in/>