1/4 B.Tech. FIRST SEMESTER
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:

At the end of the course, the student will be able to

1. Develop an awareness, and appreciation for the natural environment.
2. Understand different types of ecosystems existing in nature.
3. Gain the knowledge of biodiversity.
4. Analyze different types of pollutants present in the Environment.
5. Identify the global environmental problems and find appropriate solutions.

UNIT I

NATURAL RESOURCES:

FOREST RESOURCES – Use and over – exploitation, deforestation, case studies – Timber extraction – 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 erosion and desertification.

ENERGY RESOURCES: Renewable and non-renewable resources-Natural resources and associated problems growing energy needs, renewable and non-renewable energy sources use of 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

ECO SYSTEMS: Definition, Scope and importance, Concept of an ecosystem - Structure and function of and 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.

BIODIVERSITY AND ITS CONSERVATION: Introduction - Definition: genetic, species and ecosystem diversity. Bio-geographical classification of India, India as a mega-diversity nation, Hot-sports 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 bio diversity: In-situ and Ex-situ conservation of biodiversity.

UNIT III

ENVIRONMENTAL POLLUTION: Definition, Cause, effects and control measures of: Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution, nuclear hazards

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

GLOBAL ENVIRONMENTAL PROBLEMS AND GLOBAL EFFORTS: Green house effect, Green house gasses, Global warming, Climate change and their impacts on human environment, ozone layer depletion. International conventions / protocols: Earth summit, Kyoto protocol & Montreal protocol.

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

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.

FIELD WORK: Visit to a local area to document environmental assets River /forest grass land/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:

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

Reference Books:

1. Text Book of Environmental Studies by Deeshita Dave & P. Udaya Bhaskar, Cengage Learning.
2. Text Book of Environmental Science and Engineering by G.Tyler Miller Jr, 2006 Cengage learning
3. Text Book of Environmental Studies from Crisis to Cure by R. RajaGopalan.
4. Environmental Studies by K.V.S.G. Murali Krishna, VGS Publishers, Vijayawada

Web Resources:

1. http://nptel.ac.in/courses.php,
2. http://jntuk-coeerd.in/