

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B.Tech. II-I Sem (EEE/CSE)

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### (13A01403) ENVIRONMENTAL SCIENCE

#### Course Objective:

- To make the students to get awareness on environment, to understand the importance of protecting natural resources, ecosystem for future generations and pollution causes due to the day to day activities of human life to save earth from the inventions by the engineers.

#### UNIT – I

**MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES** : – Definition, Scope and Importance – Need for Public Awareness.

**NATURAL RESOURCES** : Renewable and non-renewable resources – Natural resources and associated problems – 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 – Mineral resources: Use and exploitation, 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. – Energy resources:

#### UNIT – II

**ECOSYSTEMS** : 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 – 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)

**BIODIVERSITY AND ITS CONSERVATION** : Introduction 0 Definition: genetic, species and ecosystem diversity – Bio-geographical classification of India – Value of biodiversity: consumptive use, Productive use, social, ethical, aesthetic and option values – Biodiversity at global, National and local levels – India as a mega-diversity nation – Hot-spots of biodiversity – 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

**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** : Causes, effects and control measures of urban and industrial wastes – Role of an individual in prevention of pollution – Pollution case studies – Disaster management: floods, earthquake, cyclone and landslides.

#### UNIT – IV

**SOCIAL ISSUES AND THE ENVIRONMENT**: From Unsustainable to Sustainable development – Urban problems related to energy – Water conservation, rain water harvesting, watershed management – Resettlement and rehabilitation of people; its problems and concerns. Case studies – Environmental ethics: Issues and possible solutions – Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies – Wasteland reclamation. – Consumerism and waste products. – Environment Protection Act. – Air (Prevention and Control of Pollution) Act. – Water

(Prevention and control of Pollution) Act – Wildlife Protection Act – Forest Conservation Act – Issues involved in enforcement of environmental legislation – Public awareness.

#### **UNIT – V**

**HUMAN POPULATION AND THE ENVIRONMENT** : Population growth, variation among nations. 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.

**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 – river, hill slopes, etc..

#### **TEXT BOOKS :**

1. *Text book of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission, Universities Press, 2005.*
2. *Environmental Studies by Palanisamy, Pearson education, 2012*
3. *Environmental Studies by R.Rajagopalan, Oxford University Press, 2<sup>nd</sup>edition, 2011.*

#### **REFERENCES :**

1. Textbook of Environmental Studies by Deeksha Dave and E. Sai Baba Reddy, Cengage Publications, 2<sup>nd</sup>edition, 2012.
2. Text book of Environmental Sciences and Technology by M.Anji Reddy, BS Publication, 2009.
3. Comprehensive Environmental studies by J.P.Sharma, Laxmi publications, 2<sup>nd</sup>edition, 2006.
4. Environmental sciences and engineering – J. Glynn Henry and Gary W. Heinke – Printice hall of India Private limited, 2<sup>nd</sup>edition, 1996.
5. Introduction to Environmental engineering and science by Gilbert M. Masters and Wendell P. Ela - Printice hall of India Private limited.
6. Introduction to Environmental engineering & Science by Gilbert M.Masters and Wendell P.Ela - Printice hall of India Private limited, 3<sup>rd</sup> edition, 2007.

**Syllabus for Internals** : For I Mid - Units I & II of syllabus and II Mid shall be conducted for III, IV & V units.