

**JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: PULIVENDULA**  
**DEPARTMENT OF CHEMISTRY**  
**II B.TECH – I/II SEMESTER Mandate Course (MC)**  
**(THEORY)**

Subject Code	Title of the Subject	L	T	P	C
	<b>Environmental Science</b>	3	0	-	0

<b>COURSE OBJECTIVES</b>	
1	To make the student understand multi disciplinary nature of environment and its components.
2	To investigate the relationship between human life and environment from scientific prospective.
3	To impart knowledge to the students about fundamental concepts of Ecosystem and Biodiversity
4	Necessasity of analyzing regional, national and global environmental problems
5	To understand and apply the fundamentals of Environmental science to important local, regional, national and global environmental problems and potential issues

<b>COURSE OUTCOMES</b>	
CO1	Able to solve the environmental problems based fundamental concepts of Environmental Science.
CO2	Enable the students to understand the structure and function of significant environmental systems
CO3	Knowledge of concepts makes them differentiate Natural and Polluted environment..
CO4	Enable to apply the Pyramid of number, mass and Energy, understand about Renweable energy resources. Illustrate the Forest ecosystem, Discuss about Grass and Net biomass productivity
CO5	Differentiate between Forest and desert Ecosystems, Critically evaluate arguments regarding environmental issues. Illustrate the Food chain and food web, Identify the applications of rain water harvesting, Interpret advantages of In-situ and Ex-situ conservation of biodiversity

**Mapping between Course Outcomes and Programme Outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1												
CO2												
CO3												
CO4												
CO5												

*Arjun*

## SYLLABUS

### UNIT-I:

#### i) **Multidisciplinary** nature of environmental studies

The **Multidisciplinary** nature of environmental studies Definition; Scope and importance, Need for public awareness.

#### ii) **Natural Resources:**

Renewable and non-renewable resources: Natural resources and associated problems.

a) Forest resources: Use and Over-exploitation, deforestation, case studies. Dams, benefits and their effects on forests and tribal people.

b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water

**c) Earth: Geomorphology, Weathering, Structure of Earth - inner core, outer core, mantle and the crust, magma.**

d) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

e) Food resources: World food problems, changes caused by agriculture, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.

- Role of an individual in conservation of natural resources.

- Equitable use of resources for sustainable lifestyles.

### UNIT-II:

#### i) **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.

Types of some ecosystems: -

a. Forest ecosystem    b. Desert ecosystem

d. Aquatic ecosystems (ponds, rivers, oceans, estuaries).

#### ii) **Biodiversity and its Conservation**

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

Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

### UNIT-III:

Environmental Pollution and Disaster management:

**Definition** - Causes, effects and control measures of:

a. Air pollution    b. Water pollution    c. Soil pollution    d. Marine pollution

e. Noise pollution    f. Thermal pollution    g. Nuclear hazards

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Disaster management: floods, earthquake, cyclone and landslides.

Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

#### **UNIT-IV:**

##### **Social Issues and the Environment**

From Unsustainable to Sustainable development. Water conservation, rain water harvesting, watershed management.

Resettlement and rehabilitation of people; its problems and concerns. Case studies.

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:**

##### **i) Human Population and the Environment**

Population growth, variation among nations. Population explosion-Family welfare Programme.

Environment and human health, Women and Child Welfare, Role of information Technology in Environment and human health, Case Studies.

##### **ii) 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 simple ecosystems-pond, river, hill slopes, etc.

#### **Text Books:**

1. Shashi Chawla, A Text Book of Environmental Studies, Mc Graw Hill Education, 4<sup>th</sup> edition, 2014
2. De A.K., Environmental Chemistry, Wiley Eastern Ltd , 2012

#### **Reference Books**

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad -380013, India, Email: mapin@icenet.net (R).
2. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p.
3. Cunningham, W.P.Cooper, T.H. Gorhani, E & Hepworth, M.T.2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.

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