23AC21T1- ENVIRONMENTAL SCIENCE

(Common to CSE, CSE (DS), CSE (AI&ML), AI&DS, and IT)

Course Category:	Audit Course	**Credits:**	3
Course Type:	Theory	**Lecture-Tutorial-Practical:**	3-0-0
Prerequisite:	Basic idea on environment, Natural Resources, Environmental pollution causes, effects and control measures.	**Sessional Evaluation:** **Univ. Exam Evaluation:** **Total Marks:**	30 70 100
Objectives:	**Students undergoing this course are expected:**		
	1. To make the students to get awareness on environment. 2. To understand the importance of protecting natural resources, eco systems 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.		

Course Outcomes	**Upon successful completion of the course, the students will be able to:**	
	CO1	Understand the value of natural resources
	CO2	Summarize the function of ecosystem, values of biodiversity and conservation
	CO3	Identify how the environment is polluted and suggest the mitigation measures
	CO4	Understand the environmental problems in India and way to minimize the effects
	CO5	Categorize the environmental protection laws in our country and role of information technology in environment protection

Course Content

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 on Food resources, World food problems – Changes caused by agriculture and over grazing, 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 Eco system Grassland ecosystem Desert ecosystem Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Bio diversity and its Conservation: Introduction, 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 Hotspots of biodiversity Threats to biodiversity Habitat loss, Poaching of wildlife, Man wild life 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 :

a. Air Pollution.
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. 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, Wild life Protection Act, Forest Conservation Act, Issues involve dine foremen to environmental legislation–Public awareness.

UNIT-V

Human Population and the Environment: Population growth, variation among nations, Population explosion, Family Welfare Programmes – 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, and birds, river, hill slopes, etc..

Text Books & References Books	**TEXT BOOKS:** 1. "Textbook of Environmental Studies" for Undergraduate Courses, Erach Bharucha for University Grants Commission, Universities Press3rd edition, 2021. 2. Palani swamy, "Environmental Studies", Pearson education, 3rd edition, 2014. 3. S. Azeem Unnisa, "Environmental Studies" Academic Publishing Company, 2nd edition, 2020. 4. K. Raghavan Nambiar, "Text book of Environmental Studies for Under graduate Courses as per UGC model syllabus", Scitech Publications(India),Pvt.Ltd., 2022. **REFERENCE BOOKS:** 1. Deeksha Daveand E.SaiBaba Reddy, "Text book of Environmental Science", Cengage Publications, 4th edition, 2018. 2. M. Anji Reddy, "Text book of Environmental Sciences and Technology", BS Publication, 3rd edition, 2016. 3. J.P.Sharma, "Comprehensive Environmental studies",Laxmi publications. 4. J.Glynn Henry and Gary W.Heinke, "Environmental Sciences and Engineering" ,Prentice hall of IndiaPrivatelimited 5. G.R.Chatwal, "A Text Book of Environmental Studies "Himalaya Publishing House 6. GilbertM.MastersandWendellP.Ela,"IntroductiontoEnvironmentalEngineeringandScience",Prentice hallofIndiaPrivatelimited.
E-Resources	1. https://nptel.ac.in/courses 2. https://freevideolectures.com/university/iitm