Class: S.Y.B.Tech Civil and Environmental Engineering **Title of the Course:** Audit Course – I : Environmental Studies **Course Code:** UCEE0361	**L**	**T**	**P**	**Credit**
	02 hours per week	---	---	02

Course Pre-Requisite:

Students shall have knowledge of:

- Science
- Technology

Course Description:

The objective of the course is imparting fundamental knowledge and awareness of Environmental science among students and importance of conservation of environment.

Course Learning Objectives:

At the end of the course students will be able to

1. Study scope and importance of natural resources, ecosystems, biodiversity for creating awareness and their conservation in multiple disciplines.
2. Learn various types of pollution, their impacts and control measures for minimizing pollution and sustainable development.
3. Understand social issues related environment, environmental ethics and human rights towards environment.
4. Study various laws and regulations related to environment and its applicability in society and industries.

Course Outcomes:

CO	**After the completion of the course the student should be able to**	**Bloom's Descriptor**
CO1	Describe natural resources, importance of ecosystem and conservation of biodiversity with respect to multiple disciplines.	Cognitive (Understanding) L2
CO2	Explain causes, effects, solutions for various pollution problems and its minimization strategies.	Cognitive (Understanding) L2
CO3	Discuss environmental ethics and their implementation for betterment of environment and human life.	Cognitive (Analyzing) L4
CO4	Differentiate between requirements of laws and regulations for environmental conservation and applicability of legislations in society and industries.	Cognitive (Analyzing) L4

CO-PO Mapping:

CO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1							2					
CO2	3											
CO3								2				
CO4						2						

COs	PSO1	PSO2
CO.1		
CO.2	1	1
CO.3		1
CO.4		1

Assessments :

Assessment	Weightage (Marks)
ESE	100

ESE: Assessment is based on 100% course content.

Course Contents:

Unit 1: Nature of Environmental Studies Definition, scope and importance, Multidisciplinary nature of environmental studies, Need for public awareness.	4 Hours
Unit 2: Natural Resources and Associated Problems a) Forest resources: Use and over-exploitation, deforestation, dams 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, dams benefits and problems. c) Mineral resources: Usage and exploitation. Environmental effects of extracting and using mineral resources. d) Food resources: World food problem, changes caused by agriculture effect of modern agriculture, fertilizer-pesticide problems. e) Energy resources: Growing energy needs, renewable and nonrenewable energy resources, use of alternate energy sources. Solar energy, Biomass energy, Nuclear energy. f) Land resources: Solar energy, Biomass energy, Nuclear energy, Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of individuals in conservation of natural resources.	4 Hours
Unit 3: 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, characteristics features, structure and function of the following ecosystem :- a) Forest ecosystem, b) Grassland ecosystem, c) Desert ecosystem, d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).	4 Hours
Unit 4:Biodiversity 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. India as a mega- diversity nation, Western Ghat as a biodiversity region. Hot-spot 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.	4 Hours

Unit 5:Environmental Pollution Definition: Causes, 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.	4 Hours
Unit 6: Social Issues and the Environment Disaster management: floods, earthquake, cyclone, tsunami and landslides. Urban problems related to energy Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation of people; its problems and concerns. Environmental ethics: Issue and possible solutions. Global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation. Consumerism and waste products.	4 Hours
Unit 7:Environmental Protection From Unsustainable to Sustainable development. Environmental Protection Act. Air (Prevention and Control of Pollution) Act. Water (Prevention and control of Pollution) Act. Wildlife Protection Act. Forest Conservation Act. Population Growth and Human Health, Human Rights.	4 Hours
Textbooks: 1. Environmental Studies by Dr. P.D.Raut (Shivaji University, Kolhapur)	
Reference Books: 1. Miller T.G. Jr., Environmental Science. Wadsworth Publications Co.(TB). 2. Odum, E.P.1971, Fundamentals of Ecology, W.B.Saunders Co. USA,574p 3. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines,Compliances and Standards, vol. I and II, Environmental Media (R)	
Unit wise Learning Outcomes: At the end of the course the students will be able to: UO 1: Describe scope and importance of environmental studies. UO 2: Describe types of natural resources, their use and conservation. UO 3: Explain structure and functions of ecosystem, their types and importance. UO 4: Discuss biodiversity, endangered species and methods of biodiversity conservation. UO 5: Explain causes, effects and solutions to pollution problems. UO 6: Discuss environmental ethics and various social issues related to environment. UO 7: Discuss laws and regulations for conservation of environment.	