



## **B.Tech.**

**CE / IT / AI & DS / CYBER SECURITY / CE (SE) / CSE / CSE (CC) /  
CSE (AI&ML) / CSE (CS)**

### **Semester II**

## **ENVIRONMENTAL STUDIES**

**CV3005**

**EFFECTIVE FROM July-2022**

**Syllabus version: 1.00**

Subject Code	Subject Title
CV3005	Environmental Studies

Teaching Scheme				Examination Scheme			
Hours		Credits		Theory Marks		Practical Marks	Total Marks
Theory	Practical	Theory	Practical	Internal	External	CIE	
3	0	3	0	40	60	-	100

#### Objective of the course:

- To impart basic knowledge about the environment, encourage students to explore the social, aesthetic, ethical, scientific, and technical aspects of the environment and thereby develop an attitude of concern for the environment.
- To provide a comprehensive insight into natural resources and ecosystems and spread awareness about environmental issues.
- To use relevant air, noise, water and soil control methods to solve domestic and industrial problems.

#### Course Outcomes:

Upon completion of the course, the student shall be able to

CO1: Understand the multi-disciplinary nature of the environment and identify different types of ecosystems around us and their salient features.

CO2: Identify the uses of natural resources and the need to conserve them.

CO3: Understand the importance of biodiversity and its conservation.

CO4: Define air and noise pollution and control measures.

CO5: Identify causes, effects and preventive measures of water and soil pollution.

CO6: Define, understand and explain various policies and practices made for solid waste management.

Sr. No.	Topic	Hours
<b>Unit – I</b>		
<b>1</b>	<b>Introduction to environmental studies &amp; Ecosystems:</b> Multidisciplinary nature of environmental studies, Scope and importance, Concept of sustainability and sustainable development. Concept of ecosystem, Structure and function of ecosystem; Biotic & Abiotic components, Energy flow in an ecosystem, food chains, food webs and ecological succession. Global warming - Causes, effects, process, Green House Effect, Ozone depletion.	09
<b>Unit – II</b>		

2	<b>Natural Resources: Renewable and Non-renewable Resources:</b> Land resources and land use change; Land degradation, soil erosion and desertification, Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations., Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter- state), Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.	07
<b>Unit – III</b>		
3	<b>Biodiversity and Conservation:</b> Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots, India as a mega-biodiversity nation; Endangered and endemic species of India, Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity, Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.	07
<b>Unit – IV</b>		
4	<b>Air and Noise Pollution:</b> Definition of pollution and pollutant, Natural and manmade sources of air pollution. Air Pollutants: Types, Particulate Pollutants: Effects and control, Control Devices: Bag filter, Cyclone separator, Electrostatic Precipitator. Gaseous Pollution Control: Absorber, Catalytic Converter, Effects of air pollution due to Refrigerants, I.C., Boiler. Noise pollution: sources of pollution, measurement of pollution level, Effects and causes of Noise pollution, Noise pollution (Regulation and Control) Rules, 2000.	07
<b>Unit – V</b>		
5	<b>Water and Soil Pollution:</b> Sources of water pollution, Types of water pollutants, Characteristics of water pollutants Turbidity, pH, total suspended solids, total solids BOD and COD: Definition. Waste Water Treatment: Primary methods, Secondary methods, Tertiary Method. Causes, Effects and Preventive measures of Soil Pollution: Causes- Excessive use of Fertilizers, Pesticides and Insecticides, Irrigation.	07
<b>Unit – VI</b>		
6	<b>Solid Waste Management:</b> Solid waste generation- Sources and characteristics of: Municipal solid waste, E-waste: Source, composition and generation, E waste hazardous properties, Effects of pollutant (E- waste) on human health and surrounding environment, E-waste (Management and Handling) Rules, 2011; and E-Waste (Management) Rules, 2016 - Salient Features and its likely implication. Biomedical waste- Source, types, collection and treatment, Final Disposal. Collection	08

	and disposal: MSW (3R, principles, energy recovery, sanitary landfill).	
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#### Text Books:

1. Sharma J. P.: Environmental Studies, 3rd Edition, University Science Press.

#### Reference Books:

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll. Principles of Conservation Biology, Sunderland: Sinauer Associates, 2006.

#### Course objectives and Course outcomes mapping:

- To impart basic knowledge about environment, encourage students to explore the social, aesthetic, ethical, scientific, and technical aspects of environment and thereby develop an attitude of concern for environment: CO1, CO2
- To provide a comprehensive understanding of biodiversity and conservation and impart causes, effects and preventive measures of air, water, soil and noise pollution and control measures: CO3, CO4.
- To provide insight into energy sources required for domestic and industrial applications and local solid and e-waste management problems: CO4, CO5, CO6.

#### Course units and Course outcome mapping:

Unit No.	Unit Name	Course Outcomes					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Introduction to environmental studies & Ecosystems	✓					
2	Natural Resources: Renewable and Non-renewable Resources		✓				
3	Biodiversity and Conservation			✓			
4	Air and Noise Pollution				✓		
5	Water and Soil Pollution					✓	
6	Solid Waste Management						✓

#### Programme Outcomes:

- PO 1: Engineering knowledge: An ability to apply knowledge of mathematics, science, and engineering
- PO 2: Problem analysis: An ability to identify, formulates, and solves engineering problems
- PO 3: Design/development of solutions: An ability to design a system, component, or process to meet desired needs within realistic constraints

- PO 4: Conduct investigations of complex problems: An ability to use the techniques, skills, and modern engineering tools necessary for solving engineering problems.
- PO 5: Modern tool usage: The broad education and understanding of new engineering techniques necessary to solve engineering problems.
- PO 6: The engineer and society: Achieve professional success with an understanding and appreciation of ethical behaviour, social responsibility, and diversity, both as individuals and in team environments.
- PO 7: Environment and sustainability: Articulate a comprehensive world view that integrates diverse approaches to sustainability.
- PO 8: Ethics: Identify and demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work.
- PO 9: Individual and team work: An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO 10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give/receive clear instructions.
- PO 11: Project management and finance: An ability to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12: Life-long learning: A recognition of the need for, and an ability to engage in life-long learning.

**Programme Outcomes and Course Outcomes mapping:**

Programme Outcomes	Course Outcomes					
	C01	C02	C03	C04	C05	C06
P01	✓	✓	✓	✓	✓	✓
P02						✓
P03						
P04						
P05						
P06		✓	✓	✓	✓	✓
P07	✓	✓	✓	✓	✓	✓
P08						
P09						
P010						
P011						
P012	✓	✓	✓	✓	✓	✓