

Course Category: Other Elective Course

Course Code: OEC 301

Title of the Course: Environmental Science

Total Credit: 4 (3 Credits theory +1 Credit Practical)

Distribution of Marks: 70 (End Semester) (45T+25P) + 15 (In-Semester) + 15(HA/S/GD)

Theory: 3 Credits Total course hour: 45 hr Duration of Examination: 2 hr.

Course Objectives

The course aims to:

1. Introduce students to the basic concepts and components of the environment.
2. Create awareness regarding environmental problems and sustainable development.
3. Develop understanding about biodiversity conservation and ecosystem management.
4. Familiarize students with environmental pollution, climate change, and waste management.
5. Encourage environmental ethics and participation in environmental protection activities.

Course Outcomes (COs)

After completion of the course, students will be able to:

1. Explain the basic concepts and scope of environmental science.
2. Understand ecosystem structure, functions, and ecological balance.
3. Identify major environmental issues and methods of pollution control.
4. Discuss biodiversity conservation and sustainable use of natural resources.
5. Demonstrate awareness about environmental laws, climate change, and sustainable development.

Unit I: Fundamentals of Environmental Science (10 Hours)

Definition, scope, and importance of Environmental Science, Components of environment: Atmosphere, Hydrosphere, Lithosphere, Biosphere, Interdisciplinary nature of Environmental Science, Natural resources: Renewable and non-renewable resources, Forest resources, water resources, mineral resources, food resources, energy resources, Sustainable utilization and conservation of natural resources.

Unit II: Ecosystem and Biodiversity (10 L)

Concept, structure, and functions of ecosystem, Types of ecosystems: Forest, grassland, desert, aquatic ecosystems, Food chain, food web, ecological pyramids, Energy flow and

biogeochemical cycles, Biodiversity: Types and importance, Threats to biodiversity, Conservation of biodiversity: In-situ and ex-situ conservation.

Unit III: Environmental Pollution (10 L)

Definition and types of pollution, Air pollution: Sources, effects, and control measures, Water pollution: Sources, effects, and control measures, Soil pollution: Causes and prevention, Noise pollution and thermal pollution, Solid waste management, E-waste and biomedical waste management.

Unit IV: Climate Change and Sustainable Development (8 L)

Global warming and climate change, Greenhouse gases and greenhouse effect, Ozone layer depletion and acid rain, Sustainable development: Concept and goals, Renewable energy and clean technology, Role of individuals in environmental protection.

Unit V: Environmental Policies, Ethics, and Awareness (7 L)

Environmental movements in India, Major environmental laws in India: Environment Protection Act, 1986, Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, Wildlife Protection Act, 1972, Disaster management: Floods, earthquakes, landslides, and cyclones, Community participation and environmental awareness

Practical: 1 Credit Total course hour: 30 hr Duration of Examination: 3 hr.

List of Experiments:

Students may undertake any two of the following experiments:

1. Determine pH of water samples from different sources with the help of pH paper or digital pH meter.
2. Determine and compare Dissolved Oxygen of water samples from different sources.
3. Collect soil samples from different sources and compare their pH and moisture content
4. Measure sound levels at different locations using a sound-level-meter app/device

Suggested Reading

1. Environmental Chemistry – Anil Kumar De
2. Sharma, P.D. – Ecology and Environment
3. Agarwal, K.C. – Environmental Biology
4. Rajagopalan, R. – Environmental Studies