



Semester 3

BRANCH	Subject Title	Subject Code
B.Sc. (ENVIRONMENTAL SCIENCE-MAJOR)	Environmental pollution and Management strategies	ESM1-131

Course Learning outcomes (CLO),

1. Students will pollution, if's gher the detailed account of noise- andards, health impacts and control measures.
2. Student will learn about soil pollution, its impact, soil conservation restoration and reclamation strategies.
3. Students will get the idea about the solid wastes and its management
4. Students will get to know how to make wealth from
5. Waste
6. Students will learn about radioactive pollution, its impact on human health and environment and control measures.
7. Students will also have knowledge of major nuclear disasters.
8. Students will get the idea about the E-wastes, impact on health and control measures.
9. Students will develop an insight about biomedical waste, its impact on health and control measures.
10. Students will have the knowledge of major gas tragedies

CONCEPT

Unit - 1

1.Noise Pollution

1.1 Definition and sources of noise pollution.

1.2 Permissible ambient noise levels of different areas. Impacts on life forms and humans - working efficiency, physical and mental health. .

1.3 Noise pollution management & control.

Unit – 2

2. Soil Pollution

2.1 Definition and sources of soil pollution

2.2 Types of soil pollutants.



2.3 Impact of soil pollution on plant animals, soil organisms and human health.

2.4 Principles and methodologies for soil conservation and restoration.

2.5 General idea about Usar soil and its reclamation

Unit - 3

3.Solid Waste Pollution

3.1 Definition and sources of solid waste pollution.

3.2 Classification of solid waste.

3.3 Solid waste disposal and management.

3.4 Land filling, incineration, biocomposting, vermiculture.

3.5 7R Hierarchy of resource efficiency and solid waste management (remove, reduce, re-source, reuse, recycle, recover, return)

3.6 Utilization of agricultural waste

3.7 Utilization of fly ash.

Unit - 4

4. Radioactive and E-Waste Pollution

4.1 Radioactive materials and sources of radioactive pollution.

4.2 Type of radiation- ionizing and non-ionizing radiation.

4.3 Active life of nuclear wastes and its decay chains.

4.4 Effect of radiation on human health (somatic and genetic effects).

4.5 Chernobyl disaster, Hiroshima and Nagasaki disaster,

4.6 Control measures of radioactive pollution.

4.7 E-Waste Pollution - definition, sources, types of E- waste. effects and control measures.



Unit – 5

5. Biomedical waste and health hazard

- 5.1 Biomedical waste- general idea.
- 5.2 Characterization and quantification of Biomedical waste.
- 5.3 Impact of biomedical waste on human health, other organisms and environment.
- 5.4 Biomedical waste management and handling rules 1998
- 5.5 Bhopal gas tragedy- cause, effects.

Practical

Practicals

1. Estimation of conductivity of different soil samples
2. Estimation of pH of soil samples using pH meter.
3. Estimation of Carbonates of soil samples.
4. Estimation of Chloride of soil samples. Estimation of Sulphate of soil samples.
5. Estimation of Phosphate of soil samples. Estimation of Nitrate of soil samples.
6. Study of noise pollution in different areas of the cit noise level meter.
7. Field visit to solid waste management site.
8. Management of solid waste through-
 1. Vermicomposting
 2. Biocomposting
 3. Biogas plant
9. Survey of solid waste production in different localities.
10. Radiation pollution (photographs and description)



Semester 4

BRANCH	Subject Title	Subject Code
B.Sc. (ENVIRONMENTAL SCIENCE-MAJOR)	Environmental Pollution and Control Techniques	ESM1-141

Course Learning outcomes (CLO)

- 1) Students will learn the basic idea of environmental pollution and pollutants.
- 2) Students will get the various concepts related to water pollution
- 3) Students will learn the impact of water pollution on human health, other organisms and ecosystems.
- 4) Students will have the idea about control measures of water pollution including water treatment plants.
- 5) Students will be able to know detailed concepts of air pollution, and its control measures.
- 6) Students will develop understanding on global pollution problems, climate change, and its impacts on human health.
- 7) Students will be able to know about thermal and marine pollution, their impacts and control measures.

Content

Unit – 1

1. Water Pollution(1)

- 1.1 Definition of pollution; pollutants; types of pollutants.
- 1.2 Fresh water pollution - Sources of surface and groundwater pollution
- 1.3 Water quality parameters (physicochemical and bacteriological and standards (BIS)
- 1.4 Effect of water contaminants on human health (nitrate, arsenic, chlorine, cadmium, mercury, pesticides)
- 1.5 Water borne diseases (Gastroenteritis, Hepatitis, Cholera Typhoid, etc.).



Unit - 2

2. Water Pollution(2)

2.1 General idea of BOD, DO,COD

2.2 Eutrophication.

2.3 Bioaccumulation, Biological magnification.

2.4 Water pollution control measures with special reference to- Effluent treatment plant (ETPs)

2.5 Sewage treatment plant (STPs)

2.6 River pollution in India..

Unit - 3

3. Air Pollution

3.1 Air pollution - definition of air pollution, types and sources of air pollutants.

3.2 National Ambient Air Quality Standards of India

3.3 Effects of different pollutants on human health (NOX, SOX, PM, CO, CO₂, hydrocarbons, PAN and VOCs), PM₁₀, PM_{2.5}.

3.4 Prevention and control of air pollution by air pollution control devices.

3.5 Air quality management- green belt development.



Unit – 4

4.Global Air Pollution Problems

- 4.1 Green house effect (explanation with schematic diagram).
- 4.2 Global warming and climate change, sea level rise.
- 4.3 Ozone depletion - Causes, effects and mitigation measures.
- 4.4 Smog and Photochemical smog Causes, effects and mitigation measures.
- 4.5 Acid rain-Causes, effects and mitigation measures.
- 4.6 Concept of carbon credit, carbon trading and carbon footprint.

Unit – 5

5.Marine water and Thermal Pollution

- 5.1 Marine water pollution- Sources of marine water pollution.
- 5.2 Effects of marine water pollution.
- 5.3 Oil spill and its effects; threats to coral reefs due to marine pollution.
- 5.4 Control measures of marine water pollution
- 5.5 Thermal pollution - Causes, effects and control measures

Practical

1. Estimation of turbidity in water samples.
2. Estimation of conductivity in water samples. Estimation of pH in water samples.
3. Estimation of carbonates in water samples.
4. Estimation of Total dissolved solid (TDS), total suspended solid (TSS), total solid (TS) in water samples.
6. Estimation of chloride in water samples.
7. Estimation of phosphate in water samples. Estimation of sulphate in water samples.
8. Estimation of nitrate in water samples.
9. Field visit to sewage/waste water treatment



Demonstration of air sampling instruments

- a. Tilak air sampler
- b. Rotorod air Sampler
- c. High volume air sampler.
- d. Demonstration of air quality monitoring station.