

ENVIRONMENTAL SCIENCE

Module – I (10 hours)

Ecological Concepts: Biotic components, Ecosystem Process: Energy, Food Chain, Water cycle, Oxygen cycle, Nitrogen cycle, carbon cycle, Environmental gradients, Tolerance levels of environment factor, EU, US and Indian Environmental Law. Chemistry in Environmental Engineering: Atmospheric chemistry, Soil chemistry. Noise pollution- Noise standards, measurement and control. Water Treatment: water quality standards and parameters, Ground water. Water treatment processes, Pre-treatment of water, Conventional process, Advanced oxidation process.

Module – II (14 hours)

(a) Waste Water Treatment: COD and BOD of Waste water treatment process, pretreatment, primary and secondary treatment of waste water, Activated sludge treatment: Anaerobic digestion, Reactor configurations and methane production.

(b) Air Pollution : Air pollution and pollutants, criteria of pollutants, Acid deposition, Global climate change–greenhouse gases, air pollution meteorology, Atmospheric dispersion. Industrial Air Emission Control. Flue gas desulphurization, NO_x removal, Fugitive emissions.

(c) Solid waste, Hazardous waste management, Solid Waste Management, Source classification and composition of MSW: Separation, storage and transportation, Reuse and recycling, zero waste management, Hazardous Waste Management, Hazardous waste and their generation, Transportation and treatment: Incinerators, super critical liquids, Inorganic waste treatment. E.I.A., Environmental auditing

Module – III (12 hours)

Occupational Safety and Health Acts, Safety procedures, Type of Accidents, Chemical and Heat Burns, Prevention of Accidents involving Hazardous substances, Human error and Hazard Analysis. Hazard Control Measures in integrated steel industry, Petroleum Refinery, L.P.G. Bottling, Pharmaceutical industry. Fire Prevention – Detection, Extinguishing Fire, Electrical Safety, Product Safety. Safety Management- Safety Handling and Storage of Hazardous Materials, Corrosive Substances, Gas Cylinders, Hydro Carbons and Wastes. Personal Protective Equipments.

Text and Reference Books:

1. Environmental Engineering Irwin/ McGraw Hill International Edition, 1997, G. Kiely
2. Industrial Safety Management, L. M. Deshmukh, Tata McGraw Hill Publication.
3. Chemistry for Environmental Engineering and Science, Clair N. Sawyer, Perry L. McCarty and Gene F. Parkin, 5th edition, McGrawHill
4. Environmental Engineering by Arcadio P. Sincero & Gergoria A. Sincero PHI Publication
5. Principles of Environmental Engineering and Science, M. L. Davis and S. J. Masen, McGraw Hill International Edition, 2004
6. Environmental Science, Curringham & Saigo, TMH,
7. An Introduction to Environmental Engineering and Science by Gilbert M. Masters & Wendell P.Ela - PHI Publication.
8. Industrial Safety Management and Technology, Colling. D A – Prentice Hall, New Delhi.