CH488: ENVIRONMENTAL ENGINEERING & SAFETY

CREDITS = 4 (L = 4, T=0, P = 0)

1.	**DETAIL 1**: Introduction of environment, eco-system and biosphere; hydrologic cycle and nutrient cycle; impact of man on the environment.	2 Hours
2.	**ATMOSPHERIC POLLUTION**: Sources and effects; nature of pollutants and their sampling and measurements; control methods viz. gravitational settling chambers, cyclone separator, fabric filters, electrostatic precipitator, scrubbers etc.; dispersion model; chimney, flares and incinerators; ozone hole depletion and green house effect.	8 Hours
3.	**WATER POLLUTION**: Sources and classification of water pollutants; domestic and industrial waste water treatment; sampling and analysis; sedimentation; clarification, flotation; concept of BOD, COD, TDS; biological treatment; activated sludge process; trickling filters; recovery of materials from process effluents; design of water pollution control equipment.	8 Hours
4.	**NOISE & THERMAL POLLUTION**, Radioactive pollution, Solid waste collection, treatment and disposal. Waste recovery system.	6 Hours
5.	**CLASSIFICATION AND CONTROL OF HAZARDS**: Hazardous properties of chemicals: Flammability, reactivity, and toxicity. storage, transport and handling of hazardous chemicals. Job safety analysis; process safety management. Prevention, MSDS.	8 Hours
6	**IDENTIFICATION AND ANALYSIS OF HAZARD**. Plan for emergency. Risk management routines. Emergency shut down systems. Role of computers in safety. Prevention of hazard, HAZOP study, Fault Tree Analysis, Event Tree Analysis	8 Hours

REFERENCE BOOKS

Title: Environmental pollution control engineering
Author: C S Rao
Publisher: Wiley eastern Ltd.

Title: Pollution control in process industries
Author: Mahajan
Publisher: Tata-McGraw Hill

Title: Introduction to Environmental Engineering (2nd Edition)
Author: M L Davis & D A Cornwall

Publisher: McGraw Hill

Title: Accident Prevention Manual for Industrial Operations
Author: National Safety Council
Publisher: Chicago, USA

Title: Environmental Science & Engineering
Author: J G Henry & G H Heinke
Publisher: Prentice Hall International