

UCH503 INDUSTRIAL POLLUTION ABATEMENT

L	T	P	Cr
3	1	2	4.5

Introduction: Industrial pollution, Different types of wastes generated in an industry, Different water pollutants, Air pollutants and solid wastes from industry, Their effects on living and non-living things, Environmental regulatory legislations and standards, Importance of industrial pollution abatement, Concept of sustainable development, Green house gases, Global warming and climate change.

Water Pollution: Identification, quantification and analysis of wastewater, Classification of different treatment methods into physico-chemical and biochemical techniques, Physico-chemical methods, General concept of primary treatment, Liquid-solid separation, Design of a settling tank, Neutralization and flocculation, Biological methods, Concept of aerobic digestion, Design of activated sludge process, Concept of anaerobic digestion, Biogas plant layout, Different unit operations and unit processes involved in conversion of highly polluted water to potable standards.

Air Pollution: Classification of air pollutants, Nature and characteristics of gaseous and particulate pollutants, Analysis of different air pollutants, Description of stack monitoring kit and high volume sampler, Atmospheric dispersion of air pollutants, Gaussian model for prediction of concentration of pollutant down wind direction, Concept of temperature inversion, Plume and its behavior, Concept of effective stack height, Operating principles and simple design calculations of particulate control devices like gravity settling chamber, cyclone, bag filters, electrostatic precipitators and scrubbers, Brief concepts of control of gaseous emissions by absorption, adsorption, chemical transformation and combustion.

Solid Wastes: Analysis and quantification of hazardous and nonhazardous wastes, Treatment and disposal of solid wastes, Land filling, Leach ate Treatment, Incineration.

Environmental Management System: Environment impact assessment, Its concept and constituents, Environmental audit, ISO-14000 system.

Laboratory work: Characterization of waste water (pH, BOD, COD, Nitrate, Phosphate, Solids, Turbidity, Alkalinity, Hardness, Dissolved oxygen and fluoride), Ambient air quality measurement by high volume sampler (Particulate, SO_x, NO_x), Gas analysis with Orsat apparatus, Determination of sludge volume index.

Text Books:

1. Peavy, H.S., Rowe, D.R., and Tchobanoglous, G. Environmental Engineering, McGraw Hill International (1985).
2. Metcalf & Eddy, Wastewater Engineering, Tata McGraw-Hill Education Private Limited (2009).

Reference Books:

1. Masters, G.M., Introduction to Environmental Engineering and Science, Prentice hall off India, (2008).
2. De Nevers, N., Air Pollution Control Engineering, McGraw-Hill (2000).
3. Rao, C.S., Environmental Pollution Control Engineering, Wiley Eastern (2010).