

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma in Chemical Engineering

Semester: 4

Subject Name: **POLLUTION CONTROL AND EFFLUENT TRETMA**

Sr No.	Course Content
1	Introduction to Pollution 1.1 Definition of pollution and pollutant 1.2 Sources of Pollution – Natural sources, Agricultural sources, Industrial sources 1.3 Effect of pollution on Human health, Vegetation, Animal life & Environment
2	Air Pollution and Control methods 2.1 Introduction 2.2 Classification of Air Pollutants 2.3 Sources of Air Pollution 2.4 Effect of Air pollution on human health, animals and material 2.5 Ambient air sampling, particulate and gaseous sample collection methods 2.6 Particulate control methods : 2.6.1 Gravity Settling Chamber 2.6.2 Cyclone separator 2.6.3 Fabric Filter 2.6.4 Wet Scrubber 2.6.5 Electrostatic Precipitator 2.6.6 Absorption, Adsorption and Incineration. 2.7 Control of Gaseous Pollutants : 2.7.1 Control of SO ₂ Emission 2.7.2 Control of Nitrogen Oxides 2.7.3 Carbon Monoxide Control 2.7.4 Hydrocarbon Control 2.7.5 Effluent Gas treatment
3	Water Pollution & Waste Water Treatment 3.1 Introduction of Water Pollution 3.2 Classification & Sources of Water Pollution 3.3 Characterization of water : BOD, COD, VM, Suspended Matter, Dissolved solids, pH 3.4 Different Sampling Methods 3.5 Different Physical, Chemical & Biological Treatment methods : 3.5.1 Preliminary Treatment 3.5.2 Primary Treatment 3.5.3 Secondary (Biological) Treatment (i) Trickling Filters (ii) Activated Sludge Treatment 3.5.4 Advanced treatments 3.6 Sludge processing and Disposal 3.7 Dis-infection treatment 3.8 Introduction to ETP 3.9 Norms of GPCB for potable water

4	Solid Waste Management. 4.1 Solid Waste - Sources Classification & Characteristics 4.2 Methods of solid Waste Disposal – (i)Open Dumping (ii)Sanitary Land filling (iii)Incineration (iv)Compositing 4.3 Reuse, Recycle and Recovery of Solid Waste
5	5. Environmental Audit & ISO – 14000 5.1 Need of Environmental Audit 5.2 Procedure for Environmental Audit 5.3 Introduction of ISO 14001

Laboratory Experiences:

- (1) Preparation of Detail charts of various Pollutants and sources of pollution
- (2) Study of Pollutants and Scheme of Pollution control in a chemical process plant
- (3) Removal of suspended Impurities from air by cyclone system
- (4) Sampling of ambient air, Particulate and gaseous effluent
- (5) Determination of hardness of water (Temporary and Permanent hardness)
- (6) Determination of COD of the given effluent sample
- (7) To measure the suspended particles in liquid by turbidity
- (8) To estimate chloride content of given water sample
- (9) Determination of hydrogen ion concentration (pH) of sample
- (10) To determine BOD of given sample
- (11) Determination of Dissolved Oxygen in effluent sample
- (12) Determination of acidity / alkalinity of given effluent sample
- (13) Determination total dissolved solids in given effluent sample
- (14) Find out the necessary treatment for solid waste
- (15) Prepare an Environmental Audit report of any process Industry

REFERENCES BOOKS:

- (1) Essential of Environment (337) - Course Learning Manual prepared by CEC, Directorate of Technical Education, Gujarat
- (2) G. N. Pandey & G. C.Carney, Environmental Engineering- 1989 Tata Mc GrawHill, New Delhi.
- (3) Dr. H. S. Bhatia Text Book of Environmental Pollution and Control-1998, New Delhi, Galgotia Publication.
- (4) Mr. S. S. Dara, A Text Book of Environmental Chemistry and Pollution Control-1991 S. Chand & Company Ltd, New Delhi.
- (5) S. S. Rao, Environmental Pollution control, Wiley Eastern Ltd, New Delhi
- (6) Mr. S. P. Mahajan, Pollution Control in Process Industries-1985, Tata Mc GrawHill, New Delhi.