

GUJARAT TECHNOLOGICAL UNIVERSITY

ENVIRONMENTAL ENGINEERING

B. E. SEMESTER: VII

Subject Name: **Industrial Water Pollution and Control**

Subject Code: **171303**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam (E)		Mid Sem Exam (Theory) (M)	Practical (Internal)
				Theory	Practical		
4	0	4	8	70	30	30	20

Sr. No.	Course Contents	Total Hrs
1.	Water Quality Standards for industrial use: Relevant Indian Standards for use of water in Textiles, Paper industry, chemical, Pharmaceutical, soft drink, boiler feed water, cooling tower, problems of silica, scaling & corrosion, caustic embitterment.	04
2.	Oil Pollution: Sources of oil pollution in industries. Effects of oil pollution, Treatment and removal techniques.	08
3.	Standards for disposal into different Sinks: Difference between criteria & standards, Stream standards, effluent standards, relevant Indian standards for disposal in to different sinks, costs of pollution control	04
4.	Volume & Strength reduction in industrial wastewater: measures for volume reduction & Strength Reduction	06
5.	Pre and Primary treatment for industrial wastewater: Equalization & proportioning, Neutralization, Oil Separation, Heavy metals removal.	06
6.	Common Effluent Treatment plants:	06
7.	Pollution Control in Industries: Manufacturing process, Identification & characterization of sources of wastewater, treatment of wastewater including recycling & reuse concepts in Textile industry, pharmaceutical industry, Dairy industry, sugar industry, starch industry, fertilize industry, tannery, distillery, pulp & paper industry, petrochemical industry, dye & dye intermediate.	16

8.	Treatment for strong industrial waste: Incineration, Evaporation: Natural & forces evaporation.	04
9.	Concepts of disposal of wastewater into different sinks: Disposal into river, lake, oceans	10

List of Practical:

1. Characterization of wastewater from different industries.
2. Determinations of lime dose for neutralization of acidic waste.
3. Determination of Optimum Coagulant dose.
4. Color removal by using Adsorption.
5. Treatment of high COD waste using advanced oxidation processes.

TUTORIALS:

1. Term paper on Industries including manufacturing process, identification and characterization of sources of waste water/ air pollution, treatment of waste water including waste minimization with flow diagram.
2. Assignments on Water quality Standards for different industries, standards for disposal in to different sinks.
3. Assignments on Oil pollution.
4. Assignments on Volume reduction and strength reduction.
5. Assignments on Pre and Primary treatment for industrial wastewater.

Reference Books:

1. Industrial Water pollution by Nelson L. Nemerow
2. Industrial water pollution by W .Wesley Eckenfelder –McGraw-Hill International edition
3. Wastewater Engineering, Treatment & Reuse by Metcalf & Eddy Tata – McGraw –Hill edition.
4. Handbook of industrial pollution & control Vol. I & II by S.C. Bhatia, CBS Publishers & distributors
5. Wastewater treatment by M.N. Rao & A.K. Datta.
6. Relevant Indian Standards.