



GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering

Subject Code: 3173523

Semester – VII

Subject Name: Industrial Water Pollution & Control

Type of course: Professional Elective Course

Prerequisite: Knowledge of wastewater treatment technologies.

Rationale: This course provides knowledge of industrial waste water treatment options.

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P		Theory Marks		Practical Marks		
			ESE (E)	PA (M)	ESE (V)	PA (I)		
3	0	2	4	70	30	30	20	150

Content:

Sr. No.	Content	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. Oil Pollution: Sources of oil pollution in industries. Effects of oil pollution, Treatment and removal techniques.	10
2.	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. Volume & Strength reduction in industrial wastewater: Measures for volume reduction & Strength Reduction Pre and Primary treatment for industrial wastewater: Equalization & proportioning, Neutralization, Heavy metals removal.	08



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3.	<p>Common Effluent Treatment plants: Need, concept and treatment technologies</p> <p>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.</p>	10
4.	<p>Treatment for strong industrial waste: Incineration, Evaporation: Natural & forced evaporation..</p> <p>Concepts of disposal of wastewater into different sinks: Disposal into river, lake, oceans</p>	08

Suggested Specification table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
15	15	20	12	8	0

Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create and above Levels (Revised Bloom's Taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

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 & edition Tata – Mcraw –Hill edition.
4. Handbook of Industrial Pollution & Control Vol. I & II by S.C. Bhatiya CBS , Published & distributions
5. Wastewater Treatment by M.N. Rao & A.K. Datta.
6. Relevant Indian Standards.

Course Outcome:

After learning this course students will be able to:

Sr No	CO Statement	Marks Weightage%
CO-1	Infer the standards for disposal of effluent in to different environmental sinks..	20
CO-2	Justify the benefits of pollution control to the industry.	15
CO-3	Categorize the strength and volume reduction techniques in industrial wastewater.	15
CO-4	Devise the methods for pre and primary treatment of industrial wastewater.	15



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CO-5	Appraise the concept of Common Effluent Treatment Plant.	20
CO-6	Exhibit the understanding of pollution control in major polluting industries.	15

List of Experiments

1. Determinations of lime dose for neutralization of acidic waste.
2. Determination of Optimum Coagulant dose.
3. Color removal by using Adsorption.
4. Treatment of high COD waste using advanced oxidation processes.
5. Assignments on Water quality Standards for different industries, standards for disposal in to different sinks.



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