



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Post Graduate

Branch: Environmental Management,

Course/Subject Code: ME01018051

Course / Subject Name: Industrial Wastewater Pollution

w.e.f. Academic Year:	2024-25
Semester:	1 st Semester
Category of the Course:	PEC

Prerequisite:	Knowledge of industrial wastewater and its characteristics
Rationale:	To achieve control of water pollution and to prevent the natural water bodies from being degraded by industrial pollution, it is necessary to treat and dispose industrial waste water in techno economically viable manner.

Course Outcome:

After Completion of the Course, Student will able to:

No.	Course Outcomes
01	Relate the benefits of water pollution control to the industries.
02	Discuss the disposal standards for various environmental sinks and fate & transport of pollutant discharged into it.
03	Recommend the various waste reduction techniques as well treatment of specific industrial pollutant
04	Explain the concept of Common effluent treatment plant and treatment of string industrial waste.
05	Propose the water pollution control strategies in major water polluting industries.

Teaching and Examination Scheme:

Teaching Scheme(in Hours)			Total Credits L+T+(PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR		C	Theory		Tutorial/Practical	
			ESE (E)		PA/ CA (M)	PA/CA(I)	ESE (V)	
3	0	2	4	70	30	20	30	150



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Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	Standards for disposal into different Sinks: Criteria & Standards for disposal of wastewater, Stream standards, effluent standards, and relevant Indian standards for disposal into different sinks, costs of pollution control, load based & concentration based effluent standards, Gross polluting industries.	04	10
2	Disposal of wastewater into different sinks: Selection criteria, assimilative capacity of various disposal sinks such as river, lake, oceans, estuary , sewer & land for specific type of water pollutants	10	23
3	Volume & Strength reduction methods for Industrial wastewater: Different methods of volume reduction and strength reduction and their application in industries, Equalization & proportioning, Neutralization, Heavy metals removal.	05	10
4	Common waste treatment facilities Need of CETP , concept and treatment technologies at CETP & challenges	02	5
5	Management of wastewater in industries: Manufacturing process, Identification & characterization of sources of wastewater, treatment of wastewater including recycling & reuse concepts in cotton-textile industry, bulk drug industry, food industry, sugar industry, starch industry, fertilize industry, tannery, pulp & paper industry, pesticide industry, dye & dye intermediate.	14	32
6	Management of strong industrial wastewater: Incineration, Spray dryer, Evaporation: Natural & forced evaporation.	05	10
7	Oil Pollution control: Sources of oil pollution in industries. Effects of oil pollution, treatment and removal techniques	05	10
	Total	45	100



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Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks					
R Level	U Level	A Level	N Level	E Level	C Level
5	25	30	10	0	0

Where R:Remember; U:Understanding; A:Application, N:Analyze and E:Evaluate C:Create(as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) 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.

(b) Open sources of software and website: MOEF&CC, NPTEL

Suggested Course Practical List:

1. Characterization of wastewater from different industries.
2. Color removal using different adsorption materials.
3. Treatment of high COD waste using advanced oxidation processes.
4. Treatability study of given wastewater samples.
5. Presentation on manufacturing process, waste generation sources, characteristics of wastewater, treatment of wastewater for given industries.

List of Laboratory/Learning Resources Required:

Hot air oven, BOD incubator, COD digester, DO meter, pH meter, Distillation apparatus, UV-Visible spectrophotometer and glass wares.

Suggested Project List: ---

Suggested Activities for Students: Industrial effluent treatment plant visit of different industries
