GUJARAT TECHNOLOGICAL UNIVERSITY

Bachelor of Engineering (Minor/Honours Degree Syllabus)

Subject Code : N116AS02

Subject Name: Green Industrial Processes

WEF Academic Year :	2025-26
Semester :	6
Category of the Course :	Compulsory

Prerequisite : Student should have the basic idea about green technology.

Rationale :

This course is designed to apply the fundamentals of green technology to deal with effluents of chemical industries. Study of pretreatment of effluents helps to reduce its harmful effects on the ecosystem. Study of effluent characteristics is useful to select the appropriate pretreatment method.

Course Scheme :

Teaching Scheme			Total Credits	Assessment Pattern and Marks				Total Marks
				Theory		Practical		
L	T	PR	C	ESE (E)	PA(M)	ESE (V)	PA (I)	
03	00	02	04	70	00	30	00	100

Course Content :

Sr. No.	Course Content	No. of Hours	% of Weightage
1	Pollution statistics from various industries.	3	10
2	General Characteristics of Industrial Effluents, Effects on Environment - ISI tolerance limits for discharging industrial effluents into surface water, into public sewers and onto land for irrigation - Toxic chemicals from industry.	7	20
3	Pretreatment of Industrial effluents : Necessity of pretreatment - Equalization - Segregation - Process Changes Salvaging - By product Recovery. Removal by Reverse Osmosis, Ion Exchange, Electrodialysis, Solvent Extraction, Floatation. - Removal of Refractory Organics - Removal of Nitrogen and Phosphorus, DeNox, DeSOx technologies.	8	20
4	Major Industrial Effluents : Sources, Characteristics and Treatment. Food Industries: Sugar, Dairy, Distilleries, Chemical Industries: Paper and Pulp, Tanneries, Textiles, Fertilizers, Pharmaceuticals and cement and Steel industry.	6	10
5	Refinery industry - FCC, reforming, platforming, hydroforming, polymerization, alkylation, isomerization, hydrodesulfurization, hydronitrogenation.	6	15

6	Pharmaceutical and fine chemical industry, Dyestuff and intermediate industries, Perfume and flavor industry.	6	15
7	Paint industry, Edible oil industry, Food industry, Waste water.	6	10
	Total	**42**	

Reference Books :

1) Numersorn, N.L., Liquid Waste from Industry – Theories, Practice and Treatment, Addison-Wesley
2) Patwardhan, A.D., Industrial Waste Water Treatment, PHI Learning, 2009
3) Rao, M.N., and Dutta, A.K., Wastewater Treatment, IBH Publications

Course Outcome :

After Completion of the Course, Student will able to :

Sr. No.	Course Outcomes	RBT Level*
1	CO 1 – Characterize industrial effluent and interpret its effects on land, water and air.	UN
2	CO2 -Analyze the various industrial effluents and its treatments.	AN
3	CO 3- Apply the principle of sustainability using greener approach in various chemical industries.	AP

*RM: Remember, UN: Understand, AP: Apply, AN: Analyze, EL: Evaluate, CR: Create

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