



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering

Subject Code: ME02065031

Subject Name: Treatment Process, Design and Drawing

w. e. f. Academic Year:	2024-2025
Semester:	2
Category of the Course:	Profession Elective Course

Prerequisite:	Basics of Environmental studies
Rationale:	To understand the concept of sustainability and to restore the environment for pollution abatement

Course Outcome:

After Completion of the Course, Student will able :

No	Course Outcomes	RBT Level
01	To examine the technical points that are required to set up water treatment plant.	E, R
02	To examine the technical points that are required to set up wastewater treatment plant.	A, N
03	To study advanced techniques for treating water and wastewater	U, N
04	To design water treatment plant and wastewater treatment plant	A, C

**Revised Bloom's Taxonomy (RBT)*

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



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering

Subject Code: ME02065031

Subject Name: Treatment Process, Design and Drawing

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1	Combination of Unit Processes: Study of fundamental factors affecting choice of treatment units, unit processes and unit operation, hydraulic flow diagram.	6	10
2	Design of water supply system: Site selection for water treatment plant and its supply network, determination of source yield for ground water and surface water, Design of Flow measuring device, Design of Collection and conveyance system, Preparation of layout plan, Selection of treatment units for surface and ground water sources.	15	35
3	Concepts of Design Criteria: Hydraulic Detention Time, Flow through velocity, settling velocity, surface loading rate, weir loading rate, organic loading food microorganism ratio, mean cell residence time, dimension ratio, general procedure for design calculation	14	35
4	Design of Waste water system: Site selection for wastewater treatment plant, Estimation of sewage, Design of Collection and conveyance system, Preparation of detailed layout plan, Selection of conventional treatment units for physiochemical and biological processes, Design of conventional treatment processes, Applicability and limitation for unit processes, challenges and trouble shooting for operating wastewater treatment plant. Tube settler , Desalination systems :Reverse Osmosis, Ultra Filtration, Nano Filtration,	10	20
	Total	45	100

Suggested Specification Table with Marks (Theory):

Distribution of Theory Marks (in %)					
R Level	U Level	A Level	N Level	E Level	C Level
15	20	20	20	20	5

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



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Master of Engineering

Level: PG

Branch: Civil Engineering

Subject Code: ME02065031

Subject Name: Treatment Process, Design and Drawing

References/Suggested Learning Resources:

(a) Books:

1. Schroeder, Water & Waste Water Treatment, McGraw Hill
2. S. J. Arceivala, Waste Water Treatment & Disposal Marcel Dekker
3. Treatment Disposal Reuse, waste Water Engg., Metcalf Eddy Incorporation Waste Water Engineering Disposal & Reuse, McGraw Hill
4. Qasim, Wastewater treatment Plant
5. Qasim, Waterworks Engineering
6. Benefield and Randall, Biological Process Design for wastewater Treatment
7. G. L. Karia and R. A. Christian, Wastewater Treatment Concepts and Design Approach, PHI Learning Ltd.

(b) Open source software and website:

1. <https://nptel.ac.in/>

Suggested Course Practical List: If any

1. Term work will comprise of assignment and case studies based on natural wastewater system, water conservation systems, smart building, waste to energy, bio wastes, Bioremediation etc.

List of Laboratory/Learning Resources Required:

Water Testing kit

* * * * *