

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**B.E. SEMESTER : V**  
**ENVIRONMENTAL SCIENCE AND ENGINEERING**

**Subject Name: Water & Wastewater treatment technologies**

**Subject Code:153704**

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam(E)	University Exam(P)	Mid Sem Exam(Theory) (M)	Practical (Internal)
3	0	2	5	70	0	30	50

Sr No	Course Contents
1	<b>INTRODUCTION:</b> Various impurities of water and wastewater, extent of treatment required, Past trends for water and wastewater treatment, Importance of flow in water & wastewater treatment
2	Characteristics of water: physical, chemical and biological parameters, standard methods of water analyses, biodegradable waste and agricultural runoff in streams.
3	Population forecasting, prediction of water demand and wastewater generation, water and wastewater quality
4	Water and wastewater treatment plants and systems: physical, chemical and biological systems, primary, secondary and tertiary treatment, sedimentation, coagulation, flocculation, filtration, adsorption, ammonia removal, aeration, anaerobic and aerobic digestion, activated sludge and trickling filter, ion exchange, lagoons, disinfection, natural treatment systems, sludge treatment and disposal, industrial wastewater treatment: characteristics of industrial wastewater, treatment levels and available technologies.

**LIST OF PRACTICALS:**

1.	To perform the Treatability study for primary treatment using multiple Jar Test Apparatus.
2.	Determination of effect of various chemical dosing on pH and alkalinity of water.
3.	To measure Oil & Grease from waste water.
4.	Determination of Residual Chlorine in drinking water.
5.	Determination of removal efficiency in Primary treatment.

**Assignments:**

1. Sketches & description of water treatment processes
2. Questions and numericals on Screens
3. Questions and numericals on Grit chamber
4. Questions and numericals on Coagulation & flocculation/flash mixer
5. Questions and numericals on Sedimentation
6. Questions and numericals on Filtration

7. Numericals on determination of Solids
8. Questions and numericals on Disinfection

**TEXT BOOKS:**

1. Water Supply & Sewage Systems by McGhee (5<sup>th</sup> Edition-McGraw-Hill Kogakusha Ltd.)
2. Waste water Engineering Treatment & Reuse by Metcalf and Eddy (4th Edition – Tata McGraw- Hill Publishing Company Ltd.)
3. Water Works Engineering by Qasim' (Eastern Economic Edition - Prentice-Hall of India Private Ltd.)
- 4 Wastewater treatment plants by Qasim (2nd Edition-Technomic Publishing CO.INC)
5. Water Treatment Plant Design by A. G. Bhole (Published by Indian Water Works Association)
6. Environmental Engineering by Peavy and Rowe
7. Environmental Engineering by Mckenzie Davis and Cornwell (3rd Edition-published by WCB McGraw-Hill)
8. Wastewater Treatment for Pollution Control by Soli J Arceivala (2nd Edition- Tata McGraw-Hill Publishing Company Ltd)