

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

Subject Name: Water & Wastewater Treatment Design

Subject Code:163702

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	University Exam(E)	University Exam(P)	Mid Sem Exam(Theory) (M)	Practical (Internal)
3	4	0	7	70	0	30	50

Sr No	Course Contents
1	WATER TREATMENT Design of conventional water treatment units, - Aeration, chemical dosing tanks, Flash mixers, Flocculators, Sedimentation tanks, Clariflocculators, filter beds, disinfection units - hydraulic profile and layout of conventional treatment units - upgrading of existing plants - Residue management.
2	WASTEWATER TREATMENT Design of sewage treatment plant units - screen chamber, Grit chamber with proportional flow weir, sedimentation tank, Trickling filters (standard rate, high rate), Rotating Biological contactor, activated sludge process, oxidation ditches, aerated lagoons, waste stabilisation ponds - hydraulic profile and layout of primary and secondary units - Anaerobic treatment systems, septic tank and disposal system, Sludge management, Sludge thickening, sludge digestion , sludge dewatering (mechanical and gravity) - Upgrading existing plants – ultimate residue disposal.
3	INDUSTRIAL WATER TREATMENT Design of softeners, Demineralisers, Desalination plants, Boiler feed water treatment – Residue management.
4	OPERATION, MAINTENANCE AND MANAGEMENT Operational problems - Trouble shooting , Planning, Organising and Controlling of plant operations - Training of operating personnel.

CASE STUDIES:

1.	Conventional water and sewage treatment plants - Industrial water treatment plants - Sludge management facilities - Wastewater reclamation plants - Field visits.
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TEXT BOOKS:

1. Water Supply & Sewage Systems by McGhee (5th 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