GUJARAT TECHNOLOGICAL UNIVERSITY

SUBJECT NAME: COLLECTION AND CONVEYANCE OF WATER AND WASTE WATER

SUBJECT CODE: 3711710

M.E. 1st SEMESTER

Type of course: Numerical Methods/Application based systems

Prerequisite: Student shall have studied basics of water & wastewater engineering

Rationale: To provide knowledge related to the requirement of water and wastewater and its design

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks				Total Marks
L	T	P	C	Theory Marks		Practical Marks		
				ESE(E)	PA (M)	PA (V)	PA (I)	
3	0	2	4	70	30	30	20	150

Content:

Sr.No.	Topics	Hours	Percentage weight age
1	**Principle of Hydraulics** Fluid properties, Types of fluid flow, Continuity principle, energy principle and moment principle, Flow through pipes and head losses, Flow measurement, Venturimeter, Orifice meter, Notches.	8	19
2	**Water Transmission and Sanitation**: Need for transport of water and wastewater, pipe network-water transmission main design, Gravity and Pumping, Water Hammer Low cost sanitation system: septic tank, soak pit	10	24
3.	**Conveyance of water** Water distribution networks, Analysis of water distribution system, Introduction of use of computer software in water transmission and water distribution. Storage capacity of reservoir.	8	19
4.	**Municipal Waste water Collection and Conveyance:** General design Principle of sewer, Method of Collection of sewer, Layout and design of municipal sewer, sewer appurtenances, sump well and sewage pumping, Recent development in sewerage system design-maintenance of sewers.	10	24
5.	**Urban Strom Drainage system:** Necessity of Storm Drainage-Separate and Combined	6	14

	system, Rainfall Intensity-duration frequency curve-estimation of runoff-control of storm water pollution-Rain water Harvesting		

Reference Books:

1. "Manual on water supply and Treatment" by CPHEEO, Ministry of Urban Development, Government of India, New Delhi, Latest Edition.
2. "Manual on Sewerage and Sewage Treatment" by CPHEEO, Ministry of Urban Development, Government of India, New Delhi, Latest Edition.
3. Water Supply and Sanitary Engineering by G.S. Birdie and J.S. Birdie, Dhanpat Rai Publishing Co.-New Delhi
4. Wastewater Engineering: Treatment, disposal Reuse by Metcalf and Eddy, (Revised by G. Tchobanoglous) Tata-McGraw Hill, New Delhi
5. Practical Handbook on Public Health Engineering by Bajwa, G.S. Deep Publishers, Shimla, 2003
6. Water Supply and Pollution Control by Viesman, Hammer, Dun Donnelley Publisher, New York

Course Outcome:

After learning the course the students should be able to project the quantities of water and wastewater and its collection and conveyance methods

List of Experiments:

1. Numerical on various methods of Population Projection, water demand and waste water generation
2. Design of water distribution network by hardy cross method.
3. Design of Sewer Network.
4. Estimation of storm water runoff
5. Basic Application of WaterGEMS and SewerGEMS for water distribution and sewage network.

List of Open Source Software/learning website:

- http://nptel.ac.in/
- http://elearning.vtu.ac.in/