

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA IN CIVIL ENGINEERING
SEMESTER: V

Subject Name: **Water Supply and Sanitary Engineering**

(A) Water Supply:

Sr. No.	Course Content	Hours 28
1.	Introduction : 1.1 Importance and necessity 1.2 Sources of water 1.3 Suitability of water 1.4 Choice of source	1
2.	Quantity and Quality of Water: 2.1 Types of demand 2.2 Population forecast 2.3 Computation of quantity of water 2.4 Fluctuation in demand 2.5 Factors affecting demand 2.6 Impurities in water 2.7 Collection of water sample 2.8 Physical Chemical and Biological tests 2.9 Standards of quality of water	4
3.	Treatment of Water: 3.1 Objects of water treatment 3.2 Location of treatment plant 3.3 Layout of treatment plant 3.4 Basic principles of working of treatment plant 3.5 Functioning of Coagulation treatment plant 3.6 Sedimentation 3.7 Filtration 3.8 Disinfection 3.9 Water Softening	4
4.	Conveyance of Water: 4.1 Types of pipes used for conveyance 4.2 Pipe joints 4.3 Laying of Pipes 4.4 Distribution system	3
5	Valves and Fittings:	1

	5.1 Types of valves 5.2 Meters 5.3 Pipe fittings and fixtures	
6	Maintenance of Water Supply Means: 6.1 Necessity 6.2 Methods of prevent leaks 6.3 Measures for conservation of water	1

(B) Sanitary Engineering

Sr. No.	Course Content	Hours 28
1	Sanitation System: 1.1 Definitions 1.2 Objective of sewage disposal 1.3 Methods of sewage collection 1.5 Conservancy system 1.5 water carriage system	2
2	Drains and Sewers: 2.1 Classification of Drains 2.2 Sewer section 2.3 Sewer joint 2.4 Manholes 2.5 Flushing tank 2.6 Catch basin 2.7 Center line of sewer 2.8 Appurtenances and its locations 2.9 Hydraulic testing of sewer pipe 2.10 aintenance of sewer	4
3	Sewage Disposal: 3.1 Characteristics of sewage 3.2 Sampling of sewage 3.3 Natural processes of treatment of sewage 3.4 B.O.D. Test 3.5 Methods of sewage disposal	3
4	House Plumbing: 4.1 Technical terms 4.2 Plumbing tools 4.3 Pipes and pipe fittings 4.4 Fixing and jointing pipes and accessories 4.5 Traps	2

	4.6 House drainage plant 4.7 Plumbing practice and operations 4.8 Safety and precautions 4.9 Sanitary fittings	
5	Maintenance of Sewage System: 5.1 Procedure for maintenance of sewerage system 5.2 Causes of trouble and odor 5.3 Sewer cleaning operations 5.4 Requirements of maintenance 5.5 Functions of each maintenance equipments and tool 5.6 Selection of equipment for given maintenance job. 5.7 Explosives in sewers. 5.8 safety measures for sewer men	2
6	Recycling of Waste Water and Solid Waste 6.1 Different method with respect to quality of waste water 6.2 Utilization and management of solid waste	1

Laboratory Experiences:

No	Exercise	Student Activity	Hours 28
01	Numerical Example: 1 Examples on prediction of population. 9 Calculation of hardness	Student will calculate problem. Home Assignment.	00
02	Sketches : 1 Layout of Water treatment plant 2 Layout of Sewage treatment plant 3 Sedimentation tank 4 Filters 5 Pipe Joint 6 Distribution System 7 Pipe Fittings 8 Manholes 9 Flushing Tank 10 Catch basin 11 Sanitary fittings 12 Water sampler 13 House Drainage Plant	Student will draw the sketches in separate sketches book. Home Assignment.	00

03	Design: 1 Design of septic tank	Student will be given data, I.S. 2470(II) and handouts on septic tank, and he should be asked to design the septic tank. Preparation of model. (Home Assignment)	02
04	Laboratory Experiments: 1. pH value 2. Hardness of water 3. Residual chlorine 4. Turbidity 5. B.O.D. 6. C.O.D. 7. S.V.I.&S.D.I. using Imhoff cone	Student will perform the practical. He will take reading, prepare observation table, and put necessary calculation. There must be comment on findings.	14
05	Visits: 1. Water Treatment Plant 2. Sewage Treatment Plant 3. Maintenance work of water supply mains and sewage system	He will submit detailed report on visits carried out.	08
06	Seminar:	The topic for the seminar should be given to the group of three students and they shall be asked to defend the seminar in presence of teacher and other students. Each student is required to defend the seminar individually.	04

Reference Book:

No	Name of book	Author	Publisher
1	Test book of water supply & Sanitary Engg.	S.K.Hussain	Oxford & IBH
2	Elements of Public Health Engineering	K.N.Duggal	S.Chand & Co.
3	Water supply & Sanitary Engg.	Vazirani & Chandola	Khanna Publishers
4	A Text book of water supply & Sanitary Engg.	S.K.Garg	Khanna Publishers
5	Water supply & Sanitary	Birdie G.S.	Dhanpatrai & Sons
6	A Text book of water supply engineering	V.N. Gharpure	Allied Book Stall, Baroda
7	A Text book of sanitary engineering	V.N. Gharpure	Allied Book Stall, Baroda
8	Water pollution & Disposal of Waste Water on Land	U.N.Mahida	Tata McGraw Hill
9	Municipal and Rural Sanitation	Ehlers & Steel	Mc Graw hill book
10	Water and Waste water Engineering	Gorden ,Fair & Gayer Okun	John willey & Sons