

GUJARAT TECHNOLOGICAL UNIVERSITY
Diploma in Environmental Engineering
Semester: 4

Subject Name: WATER SUPPLY AND SEWERAGE SYSTEM

A: WATER SUPPLY

| Sr. No. | Course Content |
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| 1. | SOURCES OF WATER 1.1 Introduction 1.2 Importance and necessity of water supply scheme 1.3 Sources of surface water 1.4 Sources of ground water(sub surface) 1.5 Ground water yield and its measurements 1.6 Define hydrology, it's importance in generation of runoff. |
| 2. | QUANTITY OF WATER 2.1Types of demand 2.2 Methods of population forecast 2.3 Computation of quantity of water 2.4 Fluctuation of demand 2.5 Factors affecting water demand |
| 3. | COLLECTION AND CONVEYANCE 3.1 Types of intakes and explain design of intakes 3.2 Means of conveyance of water 3.3 Joints in pipe network 3.4 Use of hydraulic design of pressure pipe 3.5 Compute losses of head in pipe 3.6 Methods of laying of pipes and sewer line, its tests for straightness, water tightness and smoke test. |
| 4. | DISTRIBUTION SYSTEM 4.1 Distribution system. 4.1.1. Gravity system. 4.1.2 Pumping system. 4.1.3 Dual system. 4.2 Layout of distribution system. 4.2.1 Dead end system. 4.2.2 Grid system. 4.2.3 Circular system. 4.2.4 Radial system 4.3 Method of supplying water. 4.4 Distribution Reservoirs. 4.4.1 Earth Reservoir 4.4.2 R.C.C. Reservoir 4.4.3 Elevated Reservoir 4.4.4 Stand Pipes. |

B: SEWERAGE SYSTEM

| Sr. No. | Course Content |
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| 5. | SEWER SYSTEM 5.1 Aims and objectives of sewer disposal system 5.2 State and classify systems of sanitation. 5.3 Methods of sewage collection with their merits and demerits 5.4. Sewage conveyance system 5.5 Patterns of collection of sewage. |
| 6. | QUANTITY OF SANITARY SEWAGE 6.1 Evaluate sources of sanitary sewage 6.2 Roll of infiltration in addition of sanitary sewage 6.3 State and explain subtraction allowances 6.4 Methods of determination of quantity of sanitary sewage. 6.5 Variation in quantity of sewage 6.6 Methods of determination of quantity of storm water sewage |
| 7. | CONSTRUCTIONS AND MAINTENANCE OF SEWERS 7.1 Importance of marking centerline of sewers and position of Sewer appurtenances. 7.2 Excavation, bracing and dewatering of trenches. 7.3 Method of laying of sewers 7.4 Jointing of sewers. 7.5 Methods of Hydraulic Testing of pipes and sewers, with specifications. 7.6 Necessity of maintenance of sewers. |
| 8. | SEWER APPURTENANCES 8.1 Manholes. 8.2 Drop manholes. 8.3 Lamp holes. 8.4 Street Inlets. 8.5 Flushing tanks. 8.6 Inverted siphon. 8.7 Storm water relief work 8.8 Design of Overflows and Regulators. 8.9 Ventilation Pipes. 8.10 Service diagram for Residential /industrial building. 8.10.1 Plumbing 8.10.2 Drainage 8.10.3 Water supply 8.10.4 Electrical 8.11 Utility of service diagram w.r.t. maintenance. |
| 9. | RURAL (VILLAGE HOUSE) SANITATION. 9.1 Types of Toilet 9.2 Low cost sanitation/toilet. 9.3 Small bore sewage system. |

LABORATORY EXPERIENCES/TERM WORK :

| SR NO. | NAME OF TOPIC | LAB. EXP./TERM WORK |
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| A. WATER SUPPLY | | |
| 1 | Sources of Water | Study of sources of water and w/w and tutorials based this topic |
| 2 | Quantity of Water | Study the factors affecting quantity of water. tutorials based on population forecast. average precipitation run off |
| 3 | Collection and Conveyance | Study and tutorials based on collection and conveyance of water |
| 4 | Distribution system | Tutorials based on distribution system |
| B. SEWERAGE SYSTEM | | |
| 5 | Sewer Systems | Study of sewage collection and conveyance system. |
| 6 | Quantity of Sanitary Sewage | Tutorials based on estimation of sewage quantity. |
| 7 | Construction & Maintenance of Sewers | Study of construction and maintenance of sewers |
| 8 | Sewer Appurtenances | Study and drawing of sewer appurtenance Technical Site Visit |
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REFERENCES BOOKS:

1. Text book of Water supply and Sanitary Engg. By S K Hussain, Oxford and IBH Publication
2. Water Supply and Sanitary Engg. By G S Birdi, Dhanpatrai And Sons.
3. A text book of Water Supply by V N Gharpure, Allied Book house.
4. Water supply and Sanitary Engg. By Vazirani and Chandola, Khanna Publisers.
5. Water supply and Sewerage, By E W Steel and Terence J McGhee, McGraw Hill Book Company.
6. Related I.S.