

WATER SUPPLY ENGINEERING

Course Learning Objectives:

The course will address the following:

- Outline planning and the design of water supply systems for a community/town/city
- Provide knowledge of water quality requirement for domestic usage
- Impart understanding of importance of protection of water source quality and enlightens the efforts involved in converting raw water into clean potable water.
- Selection of valves and fixture in water distribution systems
- Impart knowledge on design of water distribution network

Course Outcomes:

Upon the successful completion of this course, the students will be able to:

- Plan the water and distribution systems
- Identify the water source and select proper in take structure
- exam the quality of water
- Select suitable treatment for raw water purification
- Select the appropriate appurtenances in the water supply

SYLLABUS

UNIT I

Water Demand and Quantity Estimation: Estimation of water demand for a town or city, Per capita Demand and factors influencing it- Types of water demands and its variations- factors affecting water demand, Design Period, Factors affecting the Design period, Population Forecasting.

UNITII

Sources of Water: Lakes, Rivers, Impounding Reservoirs, comparison of sources with reference to quality, quantity and other considerations. Ground water sources of water: Types of water bearing formations, springs, Wells and Infiltration galleries, .

Collection and Conveyance of Water: Factors governing the selection of the intake structure, Types of Intakes. Conveyance of Water: Gravity and Pressure conduits, Design aspects of pipelines, laying of pipelines

UNITIII

Quality and Analysis of Water: Characteristics of water-Physical, Chemical and Biological-Analysis of Water – Physical, Chemical and Biological characteristics. -I.S. Drinking water quality standards and WHO guidelines for drinking water

UNIT IV

Treatment of Water: Flow chart of water treatment plant, Treatment methods: Theory and Design of Sedimentation, Coagulation, Sedimentation with Coagulation, Filtration. Theory of disinfection-Chlorination and other Disinfection methods

UNIT V

Distribution of Water: Requirements-Methods of Distribution system, Layouts of Distribution networks, Pressures in the distribution layouts, Analysis of Distribution networks: Hardy Cross and equivalent pipe methods-Components of Distribution system: valves such as sluice valves, air valves, scour valves and check valves, hydrants, and water meters.

TEXTBOOKS

1. Environmental Engineering – Howard S. Peavy, Donald R. Rowe, Teorge George Tchobanoglus – Mc-Graw-Hill Book Company, New Delhi, 1985.
2. Elements of Environmental Engineering–K.N.Duggal,S.Chand & CompanyLtd., New Delhi, 2012.

REFERENCES

1. Water Supply Engineering– P. N. Modi.
2. Water Supply Engineering–B. C. Punmia
3. Water Supply and Sanitary Engineering– G. S.Birdie and J. S. Birdie
4. Environmental Engineering, D. Srinivasan, PHI Learning Private Limited, New Delhi.201