



**Semester – V**

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

**Subject Code: 09CI1504**

**Diploma Branches in which this subject is offered:** Civil Engineering

**Objective:**

The purpose of including this subject is:

- To understand how water is being transported to house hold system
- To get knowledge about waste water and its treatment.
- To understand the working of sewage treatment plant and its stages
- To get idea about sanitation system.
- To study utilization of solid waste from treatment plant.

**Credits Earned: 2**

**Course Outcomes:**

After completion of this course, student will be able to

- Get idea about water supply system of town
- How and where waste water is collected
- Learn various stages involved in sewage plant.
- Learn various types of pipes, valves, and distributary system

**Teaching and Examination Scheme**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
0	0	4	2	0	30	20	25	25	100



**Contents:**

<b>Unit</b>	<b>Topics</b>	<b>Contact Hours</b>	<b>Weightage (%)</b>
1	<b>Source, Quality and demand of water</b> <ul style="list-style-type: none"><li>• Importance and necessity of water supply Engineering,</li><li>• Sources of water,</li><li>• Choice of source,</li><li>• Types of demand,</li><li>• Population forecast Computation of quantity of water,</li><li>• Factors affecting demand,</li><li>• Impurities in water,</li><li>• Collection of water sample,</li><li>• Physical Chemical</li><li>• Biological tests,</li><li>• Standards of quality of water</li></ul>	<b>12</b>	<b>19</b>
2	<b>Treatment of water</b> <ul style="list-style-type: none"><li>• Objectives of water treatment,</li><li>• Location of water treatment plant,</li><li>• Layout of water treatment plant,</li><li>• Various stages of treatment of influent water,</li><li>• Functioning of Coagulation,</li><li>• Treatment plant Sedimentation,</li><li>• Filtration,</li><li>• Disinfection</li></ul>	<b>10</b>	<b>18</b>
3	<b>Conveyance of water</b> <ul style="list-style-type: none"><li>• Types of pipes used for conveyance,</li><li>• Pipe joints,</li><li>• Distribution system,</li><li>• Types of valves,</li><li>• Types of Meters,</li><li>• Methods to prevent leaks,</li><li>• Measures for conservation of water</li></ul>	<b>8</b>	<b>15</b>



4	<b>Sanitation system</b> <ul style="list-style-type: none"><li>Objective of sewage disposal,</li><li>Methods of sewage collection,</li><li>Classification of Drains,</li><li>Sewer section, Sewer joint,</li><li>Manhole, Flushing tank, Catch basin, Hydraulic testing of sewer pipe, Procedure for maintenance of sewerage system.</li></ul>	10	18
5	<b>Sewage Treatment and Disposal</b> <ul style="list-style-type: none"><li>Characteristics of sewage, Sampling of sewage</li><li>Treatment of sewage, B.O.D. Test, C.O.D. test, Methods of sewage disposal</li></ul>	8	15
6	<b>Recycling of Waste Water and Solid Waste</b> <ul style="list-style-type: none"><li>Different recycling method with respect to quality of waste water</li><li>Utilization and management of solid waste</li></ul>	8	15

**List of Tutorials:**

Sr. No.	Unit No.	Name of Topics	Contact Hours
1.	1	Preparation of chart on sources of water.	2
2.		Solving numerical based on water demand.	2
3.		Presentation on sources of water.	2
4.		Experiment on determines ph value of water.	2
5.		Experiment on determines hardness of water.	2
6.		Explaining standards of quality of water based in IS code provision.	2
7.	2	Preparing layout sketch of water and sewage treatment plant.	2
8.		Preparing layout sketch of sedimentation tank.	2
9.		Preparing a model of water treatment plant describing all its component and review.	6
10.	3	Presentation of model on water distribution system.	4
11.		Preparing sketch of valve, fittings and fixture.	2
12.		Presentation on methods to prevent leakage.	2
13.	4	Presentation on sanitation system its objective and method of collecting sewage	4
14.		Preparing sketch manholes, flushing tank, catch basin, sanitary fittings, water sampler, aeration tank, trickling filter	6



		and house drainage Plan.	
15.	5	Presentation on characteristics of sewage, Sampling of sewage	2
16.		Design septic tank (Student will be given data, I.S. 2470(II) and handouts on septic tank, and should be asked to design the septic tank.)	2
17.		Experiment on determines of B.O.D and C.O.D	4
18.	6	Different recycling method with respect to quality of waste water	4
19.		Group discussion on utilization and management of solid waste	4

**Instructional Method:**

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, Quiz, brainstorming.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the class-rooms.

**References:**

Sr. No.	Title of Book	Author	Publication
1	A text book of water supply & sanitary engineering	S. K. Garg	Khanna publishers
2	text book of water supply & sanitary engineering	S. K. Hussain	Oxford & Ibh
3	Elements of public health engineering	K. N. Duggal	S. Chand & CO

**Supplementary resources:**

1. <https://nptel.ac.in/courses/105106119/>