

GANPAT UNIVERSITY									
FACULTY OF ENGINEERING & TECHNOLOGY									
Programme	Diploma Engineering				Branch	Civil Engineering			
Semester	V				Version	1.0.0.0			
Effective from Academic Year			2020-21		Effective for the batch Admitted in			July 2018	
Subject code	1CI2503		Subject Name		WATER SUPPLY & SANITARY ENGINEERING				
Teaching scheme					Examination scheme (Marks)				
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	2	0	1	0	3	Theory	40	60	100
Hours	2	0	2	0	4	Practical	30	20	50

**Pre-requisites:**

- The students have to know about basics of water resources & management.

**Course Learning Outcomes:**

The course content should be taught and implemented with an aim to develop different skills leading to the achievement of the following competencies and course learning outcomes:

CO1. To identify and recognize the potential sources of water.

CO2. To devise cost effective water collection and distribution systems.

CO3. To undertake the laboratory experiments for assessing water quality.

CO4. To understand the principals of water treatment and design treatment units and Prepare lay out plan and maintain water distribution and sewer-networks.

The practical should be carried out in such a manner that students are able to acquire different learning outcomes from covered course.

**Course Content**

Name of UNIT	Unit Content	Unit Learning Outcomes	Marks	Hr
<b>UNIT – 1 SOURCES, QUALITY AND DEMAND OF WATER</b>	1.1 Importance and necessity of water supply Engineering 1.2 Sources of water 1.3 Choice of source 1.4 Types of demand 1.5 Population forecast 1.6 Computation of quantity of water 1.7 Fluctuation in demand 1.8 Factors affecting demand 1.9 Impurities in water 1.10 Collection of water sample 1.11 Physical Chemical and Biological tests 1.12 Standards of quality of water	1a Explain Importance of water supply engineering 1b Identify sources of water for potable use 1c Calculate water demand for future population 1d Enlist factor affecting water demand 1e Determine various impurities found in water source 1f List Standards of quality of water with their permissible limits.	08	05
<b>UNIT – 2 TREATMENT OF WATER</b>	2.1 Objectives of water treatment 2.2 Location of water treatment plant 2.3 Layout of water treatment plant 2.4 Basic principles of working of treatment plant 2.5 Various stages of treatment of influent water i.Functioning of Coagulation	2a State objectives of water Treatment 2b Describe principles used in water treatment. 2c Explain function of various stages of treatment of influent water	12	05

	<p>treatment plant</p> <p>ii.Sedimentation</p> <p>iii.Filtration</p> <p>iv.Disinfection</p>			
<b>UNIT – 3 CONVEYANCE OF WATER</b>	<p>3.1 Types of pipes used for conveyance</p> <p>3.2 Pipe joints</p> <p>3.3 Laying of Pipes</p> <p>3.4 Distribution system</p> <p>3.5 Types of valves</p> <p>3.6 Types of Meters</p> <p>3.7 Pipe fittings and fixtures</p> <p>3.8 Necessity of maintenance</p> <p>3.9 Methods to prevent leaks</p> <p>3.10 Measures for conservation of Water</p>	<p>3a List various materials used for pipe</p> <p>3b Explain various pipe joints in Distribution system</p> <p>3c List different valves and fittings used in pipe network</p> <p>3d Describe working principle of Laying of Pipes for Conveyance of Water</p> <p>3e Explain necessity of maintenance of water supply mains</p> <p>3f Describe Measures for conservation of water</p>	10	05
<b>UNIT – 4 SANITATION SYSTEM</b>	<p>4.1 Sanitation System</p> <p>4.2 Objective of sewage disposal</p> <p>4.3 Methods of sewage collection</p> <p>4.4 Conservancy system</p> <p>4.5 Water carriage system</p> <p>4.6 Classification of Drains</p> <p>4.7 Sewer section</p> <p>4.8 Sewer joint&amp; Manhole</p> <p>4.9 Flushing tank&amp; Catch basin</p> <p>4.10 Procedure for maintenance of sewerage system</p> <p>4.11 Sewer cleaning operations</p> <p>4.12 Safety measures for sewer-men</p>	<p>4a State objectives of sewage disposal</p> <p>4b Discuss methods of sewage collection</p> <p>4c Describe Conservancy system &amp; Water carriage system</p> <p>4d Describe sewer appurtenances</p> <p>4e Explain Testing and maintenance of sewer</p> <p>4f Explain requirement and procedure for maintenance of sewerage system</p> <p>4g Describe Safety measures for sewer-men &amp; Explosives in sewers</p>	10	05
<b>UNIT – 5 SEWAGE TREATMENT AND DISPOSAL</b>	<p>5.1 Characteristics of sewage</p> <p>5.2 Sampling of sewage</p> <p>5.3 Treatment of sewage</p> <p>5.4 B.O.D. Test, C.O.D. test</p> <p>5.5 Methods of sewage disposal</p>	<p>5a List the Characteristics of sewage</p> <p>5b Explain sewage treatment process &amp; testing – sampling, B.O.D. Test, C.O.D. test</p> <p>5c Explain methods of sewage disposal.</p>	12	05
<b>UNIT – 6 RECYCLING OF WASTE WATER AND SOLID WASTE</b>	<p>6.1 Different recycling method with respect to quality of waste water</p> <p>6.2 Utilization and management of solid waste</p>	<p>6a Explain different methods of recycling waste water</p> <p>6b Explain management and utilization of solid waste generated from society</p>	08	05
		Total	60	30

List of Practical	
No.	
<b>PART – A (Laboratory Experiments)</b>	
1	Determine pH value
2	Determine Hardness of potable water
3	Determine Residual chlorine from given sample of water
4	Determine Turbidity of water sample
5	Determine B.O.D. of wastewater sample
6	Determine C.O.D. of wastewater sample
7	Determine S.V.I.&S.D.I. using Imhoff cone for wastewater
<b>PART –B (Prepare Sketches of following)</b>	
	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 Aeration tank 14 Activated sludge process 15 Trickling Filter 16 House Drainage Plan
<b>PART –C (Visit following and prepare a detailed report)</b>	
	1. Water Treatment Plant 2. Sewage Treatment Plant 3. Maintenance work of water supply mains and sewage system
<b>PART –D (Present Seminar on a relevant topic)</b>	
	The topic for the seminar should be given to the group of five students and they shall be asked to defend the seminar in presence of teacher and other students

List of Instruments/Equipment/Trainer Board	
1	Spectrophotometer
2	Water Analysis Kit
3	B.O.D. Incubator
4	Reflux apparatus
5	Various model of Fitting and Fixtures

List of Text Books			
No	Title of Books	Authors	Publication
1	Elements of Public Health Engineering	K.N.Duggal	S.Chand & Co.
2	Water pollution & Disposal of Waste Water on Land	U.N.Mahida	Tata McGraw Hill

**List of Reference Books**

No	Title of Reference Books	Authors	Publication
1	Water and Waste water Engineering	Gorden, Fair & Gayer Okun	John willey & Sons
2	Water supply & Sanitary Engineering	Birdie G.S.	Dhanpatrai & Sons

**Link of Learning Web Resource**

1	<a href="https://swayam.gov.in/nd1_noc20_ce23/preview">https://swayam.gov.in/nd1_noc20_ce23/preview</a>
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