

## LESSON PLAN

Discipline:

Civil Engg. ,UGMIT Rayagada

Semester:

5<sup>TH</sup>

Subject:

**WATER SUPPLY AND WASTE WATER ENGINEERING(Th4)**

Class allotted:

05 P/week

Session:

2022W

Week	Class Day	Theory/Practical Topics	Remarks
1	1-5	<b>SECTION A: WATER SUPPLY</b> <b>1 Introduction to Water Supply, Quantity and Quality of water</b> 1.1 Necessity of treated water supply 1.2 Per capita demand, variation in demand and factors affecting demand  1.3 Methods of forecasting population, Numerical problems using different methods	
2	6-10	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities 1.5 Analysis of water –physical, chemical and bacteriological 1.6 Water quality standards for different uses	
3	11-15	<b>2 Sources and Conveyance of water</b> 2.1 Surface sources – Lake, stream, river and impounded reservoir 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well 2.3 Yield from well- method s of determination, Numerical problems using yield formulae ( deduction excluded) 2.4 Intakes – types, description of river intake, reservoir intake, canal intake	
4	16-20	2.5 Pumps for conveyance & distribution – types, selection, installation. 2.6 Pipe materials – necessity, suitability, merits & demerits of each type 2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method <b>3 Treatment of water</b> 3.1 Flow diagram of conventional water treatment system	
5	21-25	3.2 Treatment process / units : 3.2.1 Aeration ; Necessity 3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance 3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)	



		(Definition and concept only)	
6	26-30	<p>3.2.4 Filtration : Necessity, principles, types of filters</p> <p>Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features</p> <p>3.2.5 Disinfection : Necessity, methods of disinfection</p> <p>Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super-chlorination</p> <p>3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)</p>	
7	31-35	<p><b>4 Distribution system And Appurtenance in distribution system:</b></p> <p>4.1 General requirements, types of distribution system-gravity, direct and combined</p> <p>4.2 Methods of supply – intermittent and continuous</p> <p>4.3 Distribution system layout – types,</p>	
8	36-40	<p>comparison, suitability</p> <p>4.4 Valves-types, features, uses, purpose-slucice valves, check valves, air valves, scour valves, Fire hydrants, Water meters</p> <p><b>5 W/s plumbing in building :</b></p> <p>5.1 Method of connection from water mains to building supply</p> <p>5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.</p>	
9	41-45	<p><b>SECTION B: WASTE WATER ENGINEERING</b></p> <p><b>6 Introduction</b></p> <p>6.1 Aims and objectives of sanitary engineering</p> <p>6.2 Definition of terms related to sanitary engineering</p> <p>6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability</p>	
10	46-50	<p><b>7 Quantity and Quality of sewage</b></p> <p>7.1 Quantity of sanitary sewage – domestic &amp; industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.</p> <p>7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring</p> <p>7.3 General importance, strength of sewage,</p>	
11	51-55	<p>Characteristics of sewage-physical, chemical &amp; biological</p> <p>7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD</p> <p><b>8 Sewerage system</b></p> <p>8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability</p> <p>8.2 Shapes of sewer – rectangular, circular,</p>	
12	56-60	<p>avoid-features, suitability</p> <p>8.3 Laying of sewer-setting out sewer alignment</p> <p><b>9 Sewer appurtenances and Sewage Disposal:</b></p> <p>9.1 Manholes and Lamp holes – types, features,</p>	



		location, function 9.2 Inlets, Grease & oil trap – features, location, function 9.3 Storm regulator, inverted siphon – features, location, function	
13	61-65	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies 9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream <b>10 Sewage treatment :</b> 10.1 Principles of treatment,	
14	66-70	flow diagram of conventional treatment 10.2 Primary treatment – necessity, principles, essential features, functions 10.3 Secondary treatment – necessity,	
15	71-75	principles, essential features, functions <b>11 Sanitary plumbing for building :</b> 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage 11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice 11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe	

Signature of Faculty:

Chimmaya Maharana  
D-15/9/22

Signature of HOD:

Manas Ranjan Pradhan  
15/9/22