LESSON PLAN			
DISCIPLINE : CIVIL ENGINEERING	Semester : 5th SEM SEC B	**Name of the Teaching faculty: ARPITA ROUT**	
Subject :- Th4. WATER SUPPLY AND WASTE WATER ENGINEERING	No.of Days/ week class allotted : 5	**SESSION STARTS FROM DATE-20/08/2024 TO DATE- 08/11/2024 NO. OF WEEKS-19 WEEKS TOPICS TO BE COVERED:-**	
Week	Class Day	**Topics**	**Remarks**
		1. Introduction to Water Supply, Quantity and Quality of water (10P)	
8TH WEEK	2nd	1.1 Necessity of treated water supply	
	3rd	1.2 Per capita demand, variation in demand and factors affecting demand 1.3 Methods of forecasting population, Numerical problems using different methods	
9TH WEEK	2nd	1.3 Methods of forecasting population, Numerical problems using different methods	
	3rd	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities	
10TH WEEK	1st	1.5 Analysis of water –physical, chemical and bacteriological	
	2nd	1.6 Water quality standards for different uses	
		2. Sources and Conveyance of water (8P)	
		2.1 Surface sources – Lake, stream, river and impounded reservoir 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well	
	3rd	2.3 Yield from well- method s of determination, Numerical problems using yield formulae (deduction excluded)	
11TH WEEK	1st	2.4 Intakes – types, description of river intake, reservoir intake, canal intake	
	2nd	2.5 Pumps for conveyance & distribution – types, selection, installation 2.6 Pipe materials – necessity, suitability, merits & demerits of each type	
	3rd	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method	
12TH WEEK		**3. Treatment of water (12P)**	
	2nd	3.1 Flow diagram of conventional water treatment system 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	
	3rd	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)	
13TH WEEK	1st	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features	
	2nd	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super chlorination	
	3rd	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super chlorination	
14TH WEEK	1st	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super chlorination	
	2nd	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)	

14TH WEEK		**4. Distribution system and Appurtenance in distribution system (8P)**	
	3rd	4.1 General requirements, types of distribution system-gravity, direct and combined	
15TH WEEK		**VACATION**	Durga Puja
16TH WEEK	1st	4.2 Methods of supply – intermittent and continuous	
	2nd	4.3 Distribution system layout – types, comparison, suitability	
	3rd	4.3 Distribution system layout – types, comparison, suitability	
17TH WEEK	1st	4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters	
		SECTION B: WASTE WATER ENGINEERING **6. Introduction(5P)**	
	2nd	6.1 Aims and objectives of sanitary engineering	
	3rd	6.2 Definition of terms related to sanitary engineering Carriage System – features, comparison, suitability	
18TH WEEK	1st	6.3 Systems of collection of wastes– Conservancy and Water	
	3rd	**7. Quantity and Quality of sewage (7P)**	
		7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.	
19TH WEEK	1st	7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring	
	2nd	7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological	
	3rd	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD	
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EXTRA CLASS	1	**8. Sewerage system (5P)**	
		8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability	
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	3	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability	
	4	8.3 Laying of sewer-setting out sewer alignment	
	5	**9. Sewer appurtenances and Sewage Disposal (7P)**	
		9.1 Manholes and Lamp holes – types, features, location, function	
	6	9.2 Inlets, Grease & oil trap – features, location, function	
	7	9.3 Storm regulator, inverted siphon – features, location, function	
	8	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies	
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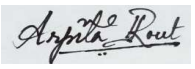
	10	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream	
		10. Sewage treatment (8P)	
	11	10.1 Principles of treatment, flow diagram of conventional treatment	
	12	10.1 Principles of treatment, flow diagram of conventional treatment	
	13	10.2 Primary treatment – necessity, principles, essential features, functions	
	14	10.2 Primary treatment – necessity, principles, essential features, functions	
	15	10.2 Primary treatment – necessity, principles, essential features, functions	
	16	10.3 Secondary treatment – necessity, principles, essential features, functions	
	17	**5. W/s plumbing in building (2P)**	
		5.1 Method of connection from water mains to building supply	

EXTRA CLASS	18	5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.	
	19	**11. Sanitary plumbing for building (3P)** 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.	
	20	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage_pipe.	



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