UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA
DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN TH4 WATER SUPPLY & WASTE WATER ENGG. 5RD SEM (2023-24)

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Period No.	Topic	Chapter
1	Introduction to subject & Necessity of treated water supply	1. Introduction to Water Supply, Quantity & Quality of water
2	Per capita demand, variation in demand and factors affecting demand	
3-5	Methods of forecasting population, Numerical problems using different methods	
6-7	Impurities in water – organic and inorganic, Harmful effects of impurities	
8-9	Analysis of water –physical, chemical and bacteriological	
10	Water quality standards for different uses	
11	Class test/ Quiz 1	
12	Surface sources – Lake, stream, river and impounded reservoir	2. Sources & Conveyance of water
13-14	Underground sources – aquifer type & occurrence Infiltration gallery, infiltration well, springs, well	
15	Yield from well- methods of determination, Numerical problems using yield formulae	
16	Intakes – types, description of river intake, reservoir intake, canal intake	
17	Pumps for conveyance & distribution – types, selection, installation.	
18	Pipe materials – necessity, suitability, merits & demerits of each type	
19	Pipe joints – necessity, types of joints, suitability, methods of jointing	
20	Laying of pipes – method	
21	Class test/ Quiz 2	
22	Flow diagram of conventional water treatment plant	3. Treatment of Water
23	Treatment process units: i) Aeration ; Necessity	
24-25	ii) Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance	
26	iii) Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier	

27-28	iv) Filtration : Necessity, principles, types of filters. Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features	
29-30	v) Disinfection : Necessity, methods of disinfection, Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super-chlorination	
31	Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method	
32	Class test/ Quiz 3	
33-34	General requirements, types of distribution system-gravity, direct and combined	4. Distribution System And Appurtenance In Distribution System.
35	Methods of supply – intermittent and continuous	
36-37	Distribution system layout – types, comparison, suitability	
38-39	Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters	
40	IA I	
41	Method of connection from water mains to building supply	5. W/S Plumbing In Buildings
42	General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.	
43	Aims and objectives of sanitary engineering.	6. Introduction to Waste Water Engineering
44-45	Definition of terms related to sanitary engineering	
46-47	Systems of collection of wastes– Conservancy and Water Carriage System –features, comparison, suitability	
48-49	Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.	7. Quantity & Quality of Sewage
50	Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring	
51-52	General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological	
53-54	Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD,COD	
55	Class test/ Quiz 4	
56-57	Types of system-separate, combined, partially separate , features, comparison between the types, suitability.	8. Sewerage System
58	Shapes of sewer – rectangular, circular, avoid-features, suitability	

59	Laying of sewer-setting out sewer alignment.	
60	Manholes and Lamp holes – types, features, location, function	9. Sewer appurtenances and Sewage Disposal:
61	Inlets, Grease & oil trap – features, location, function	
62	Storm regulator, inverted siphon – features, location, function	
63	Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies	
64	Disposal by dilution – standards for disposal in different types of water bodies, self-purification of stream	
65	Class test/ Quiz 5	
66	Principles of treatment, flow diagram of conventional treatment.	10. Sewage Treatment
67-68	Primary treatment – necessity, principles, essential features, functions	
69-70	Secondary treatment – necessity, principles, essential features, functions	
71	Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage.	11. Sanitary plumbing for building
72	Plumbing arrangement of single storied & multi storied building as per I.S. code practice	
73	Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-siphonage pipe	
74	IA II	
75	Practice Test	