

JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA

DEPARTMENT OF CIVIL ENGINEERING

### LESSON PLAN

PROGRAMME: DIPLOMA IN CIVIL ENGINEERING

SUBJECT- WATER SUPPLY & WASTE WATER ENGINEERING

Name of the FACULTY- Manaranjan Patra & Sri Soubhagya mohanty

BRANCH - CIVIL Engg.

SEMESTER-5th

Chapter	Week No.	Class Day	Lecture No.	Topic to be Covered
1				<b>Introduction to Water Supply, Quantity and Quality of water</b>
	1st	1st	1	1.1 Necessity of treated water supply.
		2nd	2	1.2 Per capita demand, variation in demand and factors affecting demand.
		3rd	3	1.3 Methods of forecasting population, Numerical problems using different methods.
		4th	4	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
		5th	5	1.5 Analysis of water –physical, chemical and bacteriological.
2				<b>Sources and Conveyance of water</b>
	2nd	1st	6	2.1 Surface sources – Lake, stream, river and impounded reservoir. 2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well.
		2nd	7	2.3 Yield from well- method s of determination, Numerical problems using yield formulae.
		3rd	8	2.4 Intakes – types, description of river intake, reservoir intake, canal intake.
		4th	9	2.5 Pumps for conveyance & distribution – types, selection, installation.
		5th	10	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

				<b>Treatment of water</b>
3	3rd	1st	11	3.1 Flow diagram of conventional water treatment system.
		2nd	12	3.2.1 Aeration ; Necessity 3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance.
		3rd	13	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only).
		4th	14	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features.
		5th	15	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, superchlorination.
				<b>Treatment of water &amp; Distribution system And Appurtenance in distribution system.</b>
3	4th	1st	16	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only).
	4	2nd	17	4.1 General requirements, types of distribution system-gravity, direct and combined.
3rd		18	4.2 Methods of supply – intermittent and continuous.	
4th		19	4.3 Distribution system layout – types, comparison, suitability	
5th		20	4.4 Valves-types, features, uses, purpose-slucie valves, check valves, air valves, scour valves, Fire hydrants, Water meters	
5	5th			<b>W/s plumbing in building</b>
		1st	21	5.1 Method of connection from water mains to building supply.
		2nd	22	5.1 Method of connection from water mains to building supply.

5th	3rd	23	5.1 Method of connection from water mains to building supply.
	4th	24	5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.
	5th	25	5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.
			<b>Introduction</b>
6th	1st	26	6.1 Aims and objectives of sanitary engineering.
	2 <sup>nd</sup>	27	6.1 Aims and objectives of sanitary engineering.

6	6th	3rd	28	6.2 Definition of terms related to sanitary engineering.	
		4th	29	6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability.	
		5th	30	6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability.	
7				<b>Quantity and Quality of sewage</b>	
	7th	1st	31	7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.	
		2nd	32	7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring	
		3rd	33	7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological.	
		4th	34	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD.	
		5th	35	Discussion of Assignment	
8				<b>Sewerage system</b>	
8	8th	1st	36	8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability	
		2nd	37	8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability	
		3rd	38	8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability	
		4th	39	Discussion of Assignment Question	
		5th	40	Discussion of Assignment Question	
					<b>Sewerage system</b>
		9th	1st	41	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
		2nd	42	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability	

	3rd	43	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
	4th	44	Discussion of Assignment Question
	5th	45	Previous year Question Discussion
10th			<b>Sewer appurtenances and Sewage Disposal</b>
	1st	46	9.1 Manholes and Lamp holes – types, features, location, function.
	2nd	47	9.1 Manholes and Lamp holes – types, features, location, function.
	3rd	48	9.2 Inlets, Grease & oil trap – features, location, function.
	4th	49	9.2 Inlets, Grease & oil trap – features, location, function.

9	10th	5th	50	Discussion of Assignment Question.
				<b>Sewer appurtenances and Sewage Disposal</b>
9	11th	1st	51	9.3 Storm regulator, inverted siphon – features, location, function.
		2nd	52	9.3 Storm regulator, inverted siphon – features, location, function.
		3rd	53	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies.
		4th	54	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
		5th	55	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
10	12th			<b>Sewage treatment</b>
		1st	56	10.1 Principles of treatment, flow diagram of conventional treatment
		2nd	57	10.1 Principles of treatment, flow diagram of conventional treatment
		3rd	58	10.2 Primary treatment – necessity, principles, essential features, functions
		4th	59	10.2 Primary treatment – necessity, principles, essential features, functions
		5th	60	Previous year Question Discussion
10				<b>Sewage treatment</b>
	13th	1st	61	10.3 Secondary treatment – necessity, principles, essential features, functions
		2nd	62	10.3 Secondary treatment – necessity, principles, essential features, functions
		3rd	63	10.3 Secondary treatment – necessity, principles, essential features, functions
		4th	64	Discussion of Assignment Question
		5th	65	Previous year Question Discussion

				<b>Sanitary plumbing for building</b>
11	14th	1st	66	11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
		2nd	67	11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
		3rd	68	11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
		4th	69	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
		5th	70	Previous Year Question Discussion
11				<b>Sanitary plumbing for building</b>
	15th	1st	71	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice.
		2nd	72	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice.
		3rd	73	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice.
		4th	74	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, antisiphonage pipe.
		5th	75	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, antisiphonage pipe.

*Soubhagya meharthy*

Manaranjan Patra

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01/07/2024

Signature of Faculty Member	Counter Signature of H.O.D.
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