JHARSUGUDA ENGINEERING SCHOOL, JHARSUGUDA

DEPARTMENT OF CIVIL ENGINEERING

LESSON PLAN

PROGRAMME: DIPLOMA IN CIVIL ENGINEERING

SUBJECT- WATER SUPLY & WASTE WATER ENGINGEERING

Name of the FACULTY- Smt Deepanjali Sethi & Sri Soubhagya mohanty

BRANCH - CIVIL Engg.

SEMESTER-5th

Chapter	Week No.	Class Day	Lecture No.	Topic to be Covered
1				**Introduction to Water Supply, Quantity and Quality of water**
	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				**Sources and Conveyance of water**
	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

Soubhagya Mohanty

				Treatment of water
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.
				Treatment of water & Distribution system And Appurtenance in distribution system.
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-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters
5	5th			**W/s plumbing in building**
		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.

Saubhagya Maharsy

	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.
				Introduction
	6th	1st	26	**6.1** Aims and objectives of sanitary engineering.
		2nd	27	**6.1** Aims and objectives of sanitary engineering.

Baishnaya Maharana

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				**Quantity and Quality of sewage**
	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 Assignement
8				**Sewerage system**
	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 Assignement Question
		5th	40	Discussion of Assignement Question
8	9th			**Sewerage system**
		1st	41	**8.2** Shapes of sewer – rectangular, circular, avoid-features, suitability
		2nd	42	**8.2** Shapes of sewer – rectangular, circular, avoid-features, suitability

Barabhagya Maharana

		3rd	43	**8.2** Shapes of sewer – rectangular, circular, avoid-features, suitability
		4th	44	Discussion of Assignement Question
		5th	45	Previous year Question Discussion
	10th			**Sewer appurtenances and Sewage Disposal**
		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.

Baishagya Maharjy

9	10th	5th	50	Discussion of Assignement Question.
				Sewer appurtenances and Sewage Disposal
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			**Sewage treatment**
		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				**Sewage treatment**
	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 Assignement Question
		5th	65	Previous year Question Discussion

Boubhagya Mohanty

				Sanitary plumbing for building
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				**Sanitary plumbing for building**
	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, antisyphonage pipe.
		5th	75	**11.3** Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, antisyphonage pipe.

Saubhagya Mohanty

15/10/2021

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