LESSON PLAN FOR WINTER 2023			
Deparment: Civil Engineering	Sem: 5TH Sec-A	Name of the Teaching faculty: DEBASHIS BEHERA	
Subject :- Th4. WATER SUPPLY AND WASTE WATER ENGINEERING	No.of Days/ week class allotted : 5	SEMESTER FROM DATE-1/08/2023 TO DATE- 30/11/2023 NO. OF WEEKS-18 WEEKS TOPICS TO BE COVERED:-	
Week	Class Day	Topics	Remarks
1st WEEK		**1. Introduction to Water Supply, Quantity and Quality of water**	
	2ND	1.1 Necessity of treated water supply	
	3rd	1.2 Per capita demand, variation in demand and factors affecting	
	4th	1.3 Methods of forecasting population, Numerical problems using different methods	
	5th	1.3 Methods of forecasting population, Numerical problems using different methods	
2nd WEEK	1st	1.3 Methods of forecasting population, Numerical problems using different methods	
	2ND	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities	
	3rd	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities	
	4th	1.5 Analysis of water –physical, chemical and bacteriological	
	5th	1.5 Analysis of water –physical, chemical and bacteriological	
3rd WEEK	1st	1.6 Water quality standards for different uses	
		2. Sources and Conveyance of water (8P)	
	2ND	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)	
	4th	2.3 Yield from well- method s of determination, Numerical problems using yield formulae (deduction excluded)	
	5th	2.4 Intakes – types, description of river intake, reservoir intake, canal intake	
4th WEEK	1st	2.5 Pumps for conveyance & distribution – types, selection,	
	2ND	2.6 Pipe materials – necessity, suitability, merits & demerits of each	
	3rd	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method	
	4th	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method	
		3. Treatment of water (12P)	
	5th	3.1 Flow diagram of conventional water treatment system 3.2 Treatment process / units : 3.2.1 Aeration ; Necessity	
5th WEEK	1st	3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation &	
	2ND	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)	
	4th	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)	
	5th	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features	
	1st	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features	

6th WEEK	2ND	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination,	
	4th	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination,	
	5th	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination,	
7th WEEK	1st	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)	
	2ND	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)	
	3rd	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)	
		4. Distribution system and Appurtenance in distribution system (8P)	
	4th	4.1 General requirements, types of distribution system-gravity, direct and combined	
	5th	4.1 General requirements, types of distribution system-gravity, direct and combined	
8th WEEK	1st	4.2 Methods of supply – intermittent and continuous	
	4th	4.2 Methods of supply – intermittent and continuous	
	5th	4.3 Distribution system layout – types, comparison, suitability	
9th WEEK	1st	4.3 Distribution system layout – types, comparison, suitability	
	2ND	4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters	
	3rd	4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters	
		SECTION B: WASTE WATER ENGINEERING6. Introduction(5P)	
	4th	6.1 Aims and objectives of sanitary engineering	
	5th	6.2 Definition of terms related to sanitary engineering Carriage System – features, comparison, suitability	
10th WEEK	2ND	6.2 Definition of terms related to sanitary engineering Carriage System – features, comparison, suitability	
	3rd	6.3 Systems of collection of wastes– Conservancy and Water	
	4th	6.3 Systems of collection of wastes– Conservancy and Water	
		7. Quantity and Quality of sewage (7P)	
	5th	7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.	
11th 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	
	4th	8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability	
	5th	8.2 Shapes of sewer – rectangular, circular, avoid-features,	
12th WEEK	1st	8.3 Laying of sewer-setting out sewer alignment	
		9. Sewer appurtenances and Sewage Disposal (7P)	
	2ND	9.1 Manholes and Lamp holes – types, features, location, function	
	3rd	9.2 Inlets, Grease & oil trap – features, location, function	
	4th	9.3 Storm regulator, inverted siphon – features, location, function	
13th WEEK		**HOLIDAY**	PUJA VACATION

14th WEEK	1st	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies	
14th WEEK	2ND	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies	
	3rd	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream	
	4th	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream	
		10. Sewage treatment (8P)	
	5th	10.1 Principles of treatment, flow diagram of conventional treatment	
15th WEEK	1st	10.1 Principles of treatment, flow diagram of conventional treatment	
	2ND	10.2 Primary treatment – necessity, principles, essential features, functions	
	3rd	10.2 Primary treatment – necessity, principles, essential features, functions	
	4th	10.2 Primary treatment – necessity, principles, essential features, functions	
	5th	10.3 Secondary treatment – necessity, principles, essential features, functions	
16th WEEK	1st	10.3 Secondary treatment – necessity, principles, essential features, functions	
	2ND	10.3 Secondary treatment – necessity, principles, essential features, functions	
		5. W/s plumbing in building (2P)	
	3rd	5.1 Method of connection from water mains to building supply	
	4th	5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.	
		11. Sanitary plumbing for building (3P)	
	5th	11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage.	
17th WEEK	1st	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice.	
	2ND	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe.	
	3rd	REVISION	
	4th	REVISION	
	5th	REVISION	
18th WEEK	2ND	REVISION	
	3rd	REVISION	
	4th	REVISION	

Debashis
01/04/2023

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