UTKAL INSTITUTE OF ENGINEERING & TECHNOLOGY

DISCIPLINE: Civil Engineering	SEMESTER: 5TH Sem	NAME OF THE TEACHING FACULTY: ER. TEJASWINI DAS		
SUBJECT: WATER SUPPLY &WASTE WATER ENGINEERING	No of Days/Per week class allotted: **5 Class P/W(77)**	Semester From Date:15/09/2022 To Date:22/12/2022 No. Of Weeks: 16		
WEEK	**CLASS DAY**	**THEORY TOPICS** **SECTION-A (WATER SUPPLY)**	**REMARKS**	
1st	1st	**1.Introduction to Water Supply, Quantity and Quality of water** 1.1 Necessity of treated water supply	Date	Dean/Principal
	2nd	1.2 Per capita demand, variation in demand and factors affecting demand		
	3rd	1.2 Per capita demand, variation in demand and factors affecting demand		
	4th	1.3 Methods of forecasting population		
	5th	Numerical problems using different methods		
	1st	Numerical problems using different methods		

2nd	2nd	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities		
	3rd	1.5 Analysis of water –physical, chemical and bacteriological		
	4th	1.5 Analysis of water –physical, chemical and bacteriological		
	5th	1.6 Water quality standards for different uses		
3rd	1st	**2.Sources Of Water** 2.1 Surface sources – Lake, stream, river and impounded reservoir		
	2nd	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well		
	3rd	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well		
	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	1st	2.5 Pumps for conveyance & distribution – types, selection, installation		
	2nd	2.6 Pipe materials – necessity, suitability, merits & demerits of each type		
	3rd	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing		
	4th	Laying of pipes – method		
	5th	**3.Treatment of water** 3.1 Flow diagram of conventional water treatment system		
5th	1st	3.2 Treatment process / units : 3.2.1 Aeration ; Necessity		
	2nd	3.2 Treatment process / units : 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)		

	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		
6th	1st	Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features		
	2nd	3.2.5 Disinfection : Necessity, methods of disinfection		
	3rd	Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super- chlorination		
	4th	Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super- chlorination		
	5th	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)		

7th	1st	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)		
	2nd	**4.Distribution system And Appurtenance in distribution system:** 4.1 General requirements, types of distribution system-gravity, direct and combined		
	3rd	4.1 General requirements, types of distribution system-gravity, direct and combined		
	4th	4.2 Methods of supply – intermittent and continuous		
	5th	4.2 Methods of supply – intermittent and continuous		
	1st	4.3 Distribution system layout – types, comparison, suitability		
	2nd	4.3 Distribution system layout – types, comparison, suitability		

8th	3rd	4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters		
	4th	4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters		
	5th	**5.W/s plumbing in building :** 5.1 Method of connection from water mains to building supply		
9th	1st	5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.		
	2nd	**SECTION B** **(WASTE WATER ENGINEERING)** **6.Introduction** 6.1 Aims and objectives of sanitary engineering		
	3rd	6.2 Definition of terms related to sanitary engineering		
	4th	6.2 Definition of terms related to sanitary engineering		

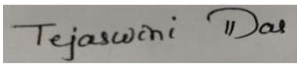
	5th	6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability		
10th	1st	6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability		
	2nd	**7.Quantity and Quality of sewage** 7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.		
	3rd	7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.		
	4th	7.2 Computation of size of sewer, application of Chezy 's formula, Limiting velocities of flow : self-cleaning and scouring		

	5th	7.2 Computation of size of sewer, application of Chezy 's formula, Limiting velocities of flow : self-cleaning and scouring		
11th	1st	7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological		
	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.Sewerage system** 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability		
	5th	8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability		

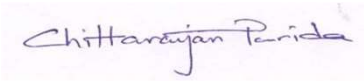
12th	1st	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability		
	2nd	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability		
	3rd	8.3 Laying of sewer-setting out sewer alignment		
	4th	**9.Sewer appurtenances and Sewage Disposal:** 9.1 Manholes and Lamp holes – types, features, location		
	5th	9.1 Manholes and Lamp holes – types, features, location, function		
13th	1st	9.2 Inlets, Grease & oil trap – features, location, function		
	2nd	9.2 Inlets, Grease & oil trap – features, location, function		
	3rd	9.3 Storm regulator, inverted siphon – features, location, function		
	4th	9.3 Storm regulator, inverted siphon – features, location, function		
	5th	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies		

14th	1st	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream		
	2nd	**10.Sewage Treatment** 10.1 Principles of treatment, flow diagram of conventional treatment		
	3rd	10.1 Principles of treatment, flow diagram of conventional treatment		
	4th	10.1 Principles of treatment, flow diagram of conventional treatment		
	5th	10.2 Primary treatment – necessity, principles, essential features, functions		
15th	1st	10.2 Primary treatment – necessity, principles, essential features, functions		
	2nd	10.3 Secondary treatment – necessity, principles, essential features, functions		
	3rd	10.3 Secondary treatment – necessity, principles, essential features, functions		

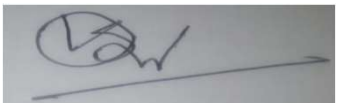
	4th	10.3 Secondary treatment – necessity, principles, essential features, functions		
	5th	**11.Sanitary plumbing for building :** 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage		
16th	1st	11.2 Plumbing arrangement of single storied & 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		



HOD



DEAN



PRINCIPAL