NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT : Th-4 (WATER SUPPLY AND WASTE WATER ENGINEERING)

Name Of The Faculty :- Er. Diptimayee Mohanty
Branch :- Civil Engineering
Session :- 2024-25
Semester :-5th
Examination :- 2024 (W)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
	PART :A (WATER SUPPLY)		
1	Introduction to Water Supply, Quantity and Quality of water	10	11
2	Sources and Conveyance of water	8	8
3	Treatment of water	12	11
4	Distribution system and Appurtenance in distribution system	8	9
5	W/s plumbing in building	2	2
	PART :B (WASTE WATER ENGINEERING)		
6	Introduction	5	6
7	Quantity and Quality of sewage	7	7
8	Sewerage system	5	6
9	Sewer appurtenances and Sewage Disposal	7	7
10	Sewage treatment	8	10
11	Sanitary plumbing for building	3	5
	Total Period:	75	82

D. Mohanty 28.06.'24
Sign of Faculty

28.06.'24
Sign of H.O.D.

Discipline: CIVIL ENGINEERING	Semester: 5th	**Name of the Teaching Faculty:** Er. Diptimayee Mohanty
		SESSION : 2024-25 **EXAMINATION :** 2024 (W)
Week	**Class Day**	**Topics to be Covered**
1st	1st	**Introduction to Water Supply, Quantity and Quality of water:** 1.1 Necessity of treated water supply
	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, Numerical problems using different method
	5th	1.3 Methods of forecasting population, Numerical problems using different method
2nd	1st	1.3 Methods of forecasting population, Numerical problems using different method
	2nd	1.3 Methods of forecasting population, Numerical problems using different method
	3rd	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
	4th	1.5 Analysis of water –physical, chemical and bacteriological
	5th	1.6 Water quality standards for different uses
3rd	1st	1.6 Water quality standards for different uses
	2nd	**Sources and Conveyance of water:** 2.1 Surface sources – Lake, stream, river and impounded reservoir
	3rd	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	4th	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	5th	2.3 Yield from well- method s of determination, Numerical problems using yield formulae (deduction excluded)
4th	1st	2.4 Intakes – types, description of river intake, reservoir intake, canal intake
	2nd	2.5 Pumps for conveyance & distribution – types, selection, installation.
	3rd	2.6 Pipe materials – necessity, suitability, merits & demerits of each type
	4th	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method

4th	5th	**Treatment of water:** 1. Design of treatment units excluded. 2. Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment 3. Field visit to treatment plant, under practical should be arranged after covering this unit. 3.1 Flow diagram of conventional water treatment system
5th	1st	3. Field visit to treatment plant, under practical should be arranged after covering this unit. 3.1 Flow diagram of conventional water treatment system
	2nd	3.2 Treatment process / units : 3.2.1 Aeration ; Necessity
	3rd	3.2 Treatment process / units : 3.2.1 Aeration ; Necessity
	4th	3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
	5th	3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
6th	1st	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulation ,Flash mixer,Flocculator,Clarifier (Defination and concept only)
	2nd	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
	3rd	3.2.5 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
	4th	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
	5th	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)
7th	1st	**Distribution system And Appurtenance in distribution system:** 4.1 General requirements, types of distribution system-gravity, direct and combined
	2nd	4.1 General requirements, types of distribution system-gravity, direct and combined
	3rd	4.2 Methods of supply – intermittent and continuous
	4th	4.2 Methods of supply – intermittent and continuous
	5th	4.2 Methods of supply – intermittent and continuous

8th	1st	4.3 Distribution system layout – types, comparison, suitability
	2nd	4.3 Distribution system layout – types, comparison, suitability
	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	**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	Introduction 6.1 Aims and objectives of sanitary engineering
	3rd	6.1 Aims and objectives of sanitary engineering
	4th	6.2 Definition of terms related to sanitary engineering
	5th	6.2 Definition of terms related to sanitary engineering
10th	1st	6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability
	2nd	6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability
	3rd	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
	4th	7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring
	5th	7.2 Computation of size of sewer, application of Chazy'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	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
	5th	**Sewerage system:** 8.1 Types of system-separate, combined, partially separate , features, comparison

12th	1st	8.1 Types of system-separate, combined, partially separate , features, comparison
	2nd	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
	3rd	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
	4th	8.3 Laying of sewer-setting out sewer alignment
	5th	8.3 Laying of sewer-setting out sewer alignment
13th	1st	REVISION
	2nd	REVISION
	3rd	**Sewer appurtenances and Sewage Disposal:** 9.1 Manholes and Lamp holes – types, features, location, function
	4th	9.2 Inlets, Grease & oil trap – features, location, function
	5th	9.2 Inlets, Grease & oil trap – features, location, function
14th	1st	9.3 Storm regulator, inverted siphon – features, location, function
	2nd	9.3 Storm regulator, inverted siphon – features, location, function
	3rd	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies
	4th	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
	5th	**Sewage treatment :** (Note: 1.Design of treatment units excluded. 2. Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment.
15th	1st	10.2 Primary treatment – necessity, principles, essential features, functions
	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	10.2 Primary treatment – necessity, principles, essential features, functions
16th	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

16th	5th	10.3 Secondary treatment – necessity, principles, essential features, functions
17th	1st	**Sanitary plumbing for building :** 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
	2nd	11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
	3rd	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	4th	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	5th	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe
18th	1st	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe
	2nd	REVISION
	3rd	REVISION
	4th	REVISION
	5th	REVISION

Mohanty 28.06.'24

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28/06/'24

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