



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)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods	No. of periods
	PART :A (WATER SUPPLY)		
1	Introduction to Water Supply, Quantity and Quality of water	10	10
2	Sources and Conveyance of water	8	8
3	Treatment of water	12	12
4	Distribution system and Appurtenance in distribution system	8	8
5	W/s plumbing in building	2	2
	PART :B (WASTE WATER ENGINEERING)		
6	Introduction	5	5
7	Quantity and Quality of sewage	7	7
8	Sewerage system	5	5
9	Sewer appurtenances and Sewage Disposal	7	7
10	Sewage treatment	8	8
11	Sanitary plumbing for building	3	3
	TOTAL	75	75
Discipline: CIVIL ENGG.	Semester: 5TH	Name of the Teaching Faculty: ER. DIPTIMAYEE MOHANTY	
Week	Class Day	Theory / Practical Topics	

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	1.3 Methods of forecasting population, Numerical problems using different methods
	4th	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
	5th	1.5 Analysis of water –physical, chemical and bacteriological
2nd	1st	1.6 Water quality standards for different uses
	2nd	1.6 Water quality standards for different uses
	3rd	Sources and Conveyance of water 2.1 Surface sources – Lake, stream, river and impounded reservoir
	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)
3rd	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

	5 th	<p>Treatment of water</p> <p>Note:</p> <ol style="list-style-type: none"> Design of treatment units excluded. Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment Field visit to treatment plant, under practical should be arranged after covering this unit. <p>3.1 Flow diagram of conventional water treatment system</p>
4 th	1 st	<p>3. Field visit to treatment plant, under practical should be arranged after covering this unit.</p> <p>3.1 Flow diagram of conventional water treatment system</p>
	2 nd	<p>3.2 Treatment process / units :</p> <p>3.2.1 Aeration ; Necessity</p>
	3 rd	<p>3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance</p> <p>3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of</p>
	4 th	<p>3.2.4 Filtration : Necessity, principles, types of filters</p> <p>Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features</p>
	5 th	<p>3.2.5 Disinfection : Necessity, methods of disinfection</p> <p>Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super- chlorination</p>
5 th	1 st	<p>3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)</p>
	2 nd	<p>Distribution system And Appurtenance in distribution system:</p> <p>4.1 General requirements, types of distribution system-gravity, direct and combined</p>
	3 rd	<p>4.2 Methods of supply – intermittent and continuous</p>
	4 th	<p>4.3 Distribution system layout – types, comparison, suitability</p>
	5 th	<p>4.4 Valves-types, features, uses, purpose-slucie valves, check valves, air valves, scour valves, Fire hydrants, Water meters</p>
	1 st	<p>W/s plumbing in building :</p> <p>5.1 Method of connection from water mains to building supply</p>
	2 nd	<p>5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.</p>

6 th	3 rd	Introduction 6.1 Aims and objectives of sanitary engineering
	4 th	6.2 Definition of terms related to sanitary engineering
	5 th	6.2 Definition of terms related to sanitary engineering
7 th	1 st	6.3 Systems of collection of wastes– Conservancy and Water Carriage System – features, comparison, suitability
	2 nd	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
	3 rd	7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring
	4 th	7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological
	5 th	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
8 th	1 st	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
	2 nd	Sewerage system 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	3 rd	Sewerage system 8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	4 th	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
	5 th	8.3 Laying of sewer-setting out sewer alignment
	1 st	Sewer appurtenances and Sewage Disposal: 9.1 Manholes and Lamp holes – types, features, location, function
	2 nd	9.2 Inlets, Grease & oil trap – features, location, function

9 th	3 rd	9.3 Storm regulator, inverted siphon – features, location, function
	4 th	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies
	5 th	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
10 th	1 st	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. 3.Field visit to treatment plant, under practical should be arranged after covering this unit.) 10.1 Principles of treatment, flow diagram of conventional treatment
	2 nd	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. 3.Field visit to treatment plant, under practical should be arranged after covering this unit.) 10.1 Principles of treatment, flow diagram of conventional treatment
	3 rd	10.2 Primary treatment – necessity, principles, essential features, functions
	4 th	10.3 Secondary treatment – necessity, principles, essential features, functions
	5 th	10.3 Secondary treatment – necessity, principles, essential features, functions
11 th	1 st	10.3 Secondary treatment – necessity, principles, essential features, functions
	2 nd	Sanitary plumbing for building : 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
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	4 th	Sanitary plumbing for building : 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage

	5th	Sanitary plumbing for building : 11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
12th	1st	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	2nd	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	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	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
13th	1st	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	2nd	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	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
14th	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	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	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe
	4th	Introduction to Water Supply, Quantity and Quality of water 1.1 Necessity of treated water supply 1.2 Per capita demand, variation in demand and factors affecting demand

	5th	1.3 Methods of forecasting population, Numerical problems using different methods
15th	1st	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
	2nd	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
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	4th	1.5 Analysis of water –physical, chemical and bacteriological
	5th	1.6 Water quality standards for different uses