



Batch -
Session - 2023-24 (Winter - 2023)
B

LESSON PLAN FOR Th.4- WATER SUPPLY AND WASTE WATER ENGINEERING

Discipline: Civil Engineering	Semester: 4th	Name of the Teaching Faculty: Ashish Nayak, Lecturer in Civil GP Kandhamal, Phulbani
Subject: WATER SUPPLY AND WASTE WATER ENGINEERING, Th.4	No. of days/ per week class allotted: 5	Semester From Date : 01/08/2023 to Date: 30/11/2023
		No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
		SECTION A: WATER SUPPLY
1ST		Introduction to Water Supply, Quantity and Quality of water
1		Necessity of treated water supply
2		Per capita demand,
3		Methods of forecasting population
4		Numerical problems using different methods
5		Impurities in water – organic and inorganic
2ND	1	Harmful effects of impurities
2		Analysis of water – physical, chemical and bacteriological
3		Water quality standards for different uses
4		variation in demand and factors affecting demand
5		Unit Test -1
		Sources and Conveyance of water
3RD	1	Surface sources – Lake, stream, river and impounded reservoir
2		Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
3		Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
4		Yield from well- methods of determination, Numerical problems using yield formulae (deduction excluded)
5		Intakes – types, description of river intake, reservoir intake, canal intake
4TH	1	Pumps for conveyance & distribution – types, selection, installation
2		Pipe materials – necessity, suitability, merits & demerits of each type
3		Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method
4		Unit Test -2
5		Student Learning Activity
		Treatment of water
5TH	1	Flow diagram of conventional water treatment system
2		Treatment process / units : Aeration ; Necessity
3		Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
4		Sedimentation with coagulation: Necessity, principles of coagulation,
5		types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)
4		Filtration : Necessity, principles, types of filters
5		Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
6TH	1	Disinfection : Necessity, methods of disinfection
2		Chlorination – free and combined chlorine demand, available chlorine, residual chlorine, pre-chlorination, break point chlorination, super-chlorination
3		Field Visit of Water Treatment Plant
4		Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)
5		Unit Test -3
		Distribution system And Appurtenance in distribution system:
7TH	1	General requirements, types of distribution system-gravity, direct and combined
2		General requirements, types of distribution system-gravity, direct and combined
3		Methods of supply – intermittent and continuous
4		Methods of supply – intermittent and continuous
5		Distribution system layout – types, comparison, suitability
8TH	1	Distribution system layout – types, comparison, suitability
2		Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire hydrants, Water meters
3		Unit Test - 4
		W/s plumbing in building
4		Method of connection from water mains to building supply
5		General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code
		WASTE WATER ENGINEERING
9TH	1	Introduction
2		Aims and objectives of sanitary engineering
3		Definition of terms related to sanitary engineering
4		Systems of collection of wastes- Conservancy and Water Carriage System – features, comparison, suitability
5		Unit Test -4
10TH		Quantity and Quality of sewage
1		Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow
2		numerical problem on computation quantity of sanitary sewage
3		Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring
4		General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological
5		Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
11TH	1	Unit Test -5
		Sewerage system
2		Types of system-separate, combined, partially separate , features, comparison between the types, suitability
3		Shapes of sewer – rectangular, circular, avoid features, suitability
4		Laying of sewer-setting out sewer alignment

	5	Unit Test -6
12TH	1	Student Learning Activity
		Sewer appurtenances and Sewage Disposal:
	2	Manholes and Lamp holes – types, features, location, function
	3	Inlets, Grease & oil trap – features, location, function
	4	Storm regulator, inverted siphon – features, location, function
	5	Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies
13TH	1	Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies
	2	Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
	3	Unit Test -7
		Sewage treatment
	4	Principles of treatment
	5	flow diagram of conventional treatment
14TH	1	Primary treatment – necessity, principles
	2	Primary treatment – essential features, functions
	3	Secondary treatment – necessity, principles, essential features, functions
	4	Secondary treatment – necessity, principles, essential features, functions
	5	Unit Test -8
		Sanitary plumbing for building
15TH	1	Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
	2	Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	3	Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets, flushing cisterns, urinals
	4	inspection chambers, traps, anti- syphonage pipe
	5	Unit Test -9
		Semester Exam Practice Test

Abheesh Nayak

31/07/2023

Abheesh Nayak
01/08/2023



J: Estimate

Semester: 5th	Name _____
No. of days/	_____
per week	_____
allotted: 4	_____
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ek	_____
1st	_____