



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
		Quantity and Quality of sewage
10TH	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
	1	Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
15TH	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-siphonage pipe
	5	Unit Test -9
		Semester Exam Practice Test

Chaitanya Nayak
21/07/2023

Chaitanya
01/08/2023

