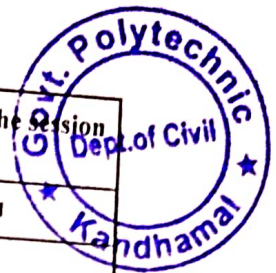
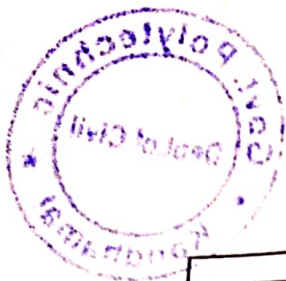


# LESSON PLAN of Th.4- WATER SUPPLY AND WASTE WATER ENGINEERING for the Session 2022-2023(Winter 2022) Govt. polytechnic Kandhamal, Phulbani



Discipline: Civil Engineering	Semester: 6th	Name of the Teaching Faculty: Ashish Nayak , Lecturer in Civil GP Kandhamal
Subject: WATER SUPPLY AND WASTE WATER ENGINEERING, Th.4	No. of days/ per week class allotted: 5	Semester From Date : 15/09/2022 to Date: 22/12/2022 21/01/2023
Week	Class Day	No. of Weeks: 15
Theory/ Practical Topics		
1ST	1	SECTION A: WATER SUPPLY
	2	Introduction to Water Supply, Quantity and Quality of water
	3	Necessity of treated water supply
	4	Per capita demand,
	5	Methods of forecasting population
2ND	1	Numerical problems using different methods
	2	Impurities in water – organic and inorganic
	3	Harmful effects of impurities
	4	Analysis of water –physical, chemical and bacteriological
	5	Water quality standards for different uses
		variation in demand and factors affecting demand
3RD	1	Sources and Conveyance of water
	2	Surface sources – Lake, stream, river and impounded reservoir
	3	Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	4	Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	5	Yield from well- method s of determination, Numerical problems using yield formulae ( deduction excluded)
	1	Intakes – types, description of river intake, reservoir intake, canal intake
4TH	2	Pumps for conveyance & distribution – types, selection, installation
	3	Pipe materials – necessity, suitability, merits & demerits of each type
		Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method
	4	Treatment of water
	5	Flow diagram of conventional water treatment system
5TH	1	Treatment process / units : Aeration ; Necessity
	2	Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
	3	Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
	4	Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)
	5	Filtration : Necessity, principles, types of filters
6TH	1	Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
	2	Disinfection : Necessity, methods of disinfection
	3	Chlorination – free and combined chlorine demand, available chlorine, residual chlorine
	4	pre-chlorination, break point chlorination, super- chlorination
	5	Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)
	1	Distribution system And Appurtenance in distribution system:
7TH	2	General requirements, types of distribution system-gravity, direct
	3	General requirements, types of distribution system-gravity, direct
	4	Methods of supply – intermittent and continuous
	5	Methods of supply – intermittent and continuous
	1	Distribution system layout – types, comparison, suitability
	2	Distribution system layout – types, comparison, suitability
8TH	3	Valves-types, features, uses, purpose-slucie valves, check valves, air valves, scour valves, Fire hydrants, Water meters
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	4	W/s plumbing in building
	5	Method of connection from water mains to building supply
		General layout of plumbing arrangement for water supply in single storied and multi storied building as per I.S. code
		<b>WASTE WATER ENGINEERING</b>
		<b>Introduction</b>
	1	Aims and objectives of sanitary engineering
9TH	2	Definition of terms related to sanitary engineering
	3	Systems of collection of wastes- Conservancy and Water Carriage System - features, comparison, suitability
	4	Systems of collection of wastes- Conservancy and Water Carriage System - features, comparison, suitability
	5	Systems of collection of wastes- Conservancy and Water Carriage System - features, comparison, suitability
	1	<b>Quantity and Quality of sewage</b>
10TH		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	Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring
	5	General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological
11TH	1	Concept of sewage-sampling, tests for - solids, pH, dissolved oxygen, BOD, COD
	2	
		<b>Sewerage system</b>
		Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	3	Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	4	Shapes of sewer - rectangular, circular, avoid-features, suitability
	5	Shapes of sewer - rectangular, circular, avoid-features, suitability
12TH	1	Laying of sewer-setting out sewer alignment
	2	<b>Sewer appurtenances and Sewage Disposal:</b>
		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
	1	Disposal on land - sewage farming, sewage application and dosing, sewage sickness-causes and remedies
13TH	2	Disposal by dilution - standards for disposal in different types of water bodies, self purification of stream
	3	Disposal by dilution - standards for disposal in different types of water bodies, self purification of stream
	4	
		<b>Sewage treatment</b>
	1	Principles of treatment
14TH	2	flow diagram of conventional treatment
	3	Primary treatment - necessity, principles
	4	Primary treatment - essential features, functions
	5	Secondary treatment - necessity, principles, essential features, functions
	1	Secondary treatment - necessity, principles, essential features, functions
	2	Sanitary plumbing for building
		Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
15TH	3	Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	4	Sanitary fixtures - features, function, and maintenance and fixing of the fixtures - water closets, flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe
	5	

*Signature of Lecturer*

*Signature of H.O.D.*

*Signature of Principal*

15/9/22

H. O. D.

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Kandhamal