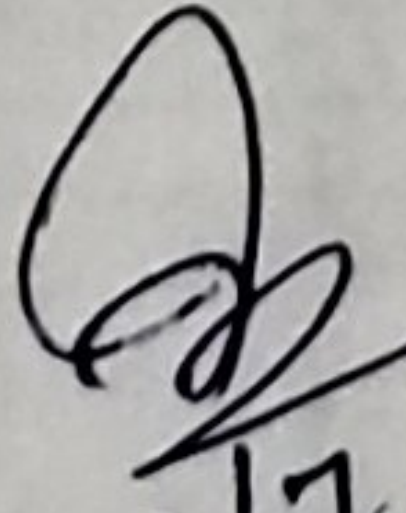
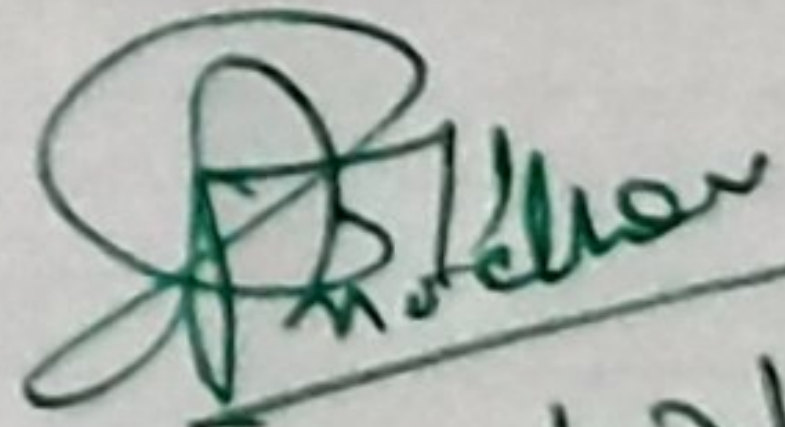


LESSON PLAN : TH.4-WATER SUPPLY & WASTE WATER ENGINEERING FOR THE SESSION 2025
26(WINTER-2025) BATCH-2023-26, GOVT. POLYTECHNIC,KANDHMAL,PHULABANI

Discipline: civil engineering	Semester: 5TH	Name of the Teaching Faculty: Ashish Nayak, Lecturer in Civil Engg.
Subject: TH.4-WATER SUPPLY & WASTE WATER ENGINEERING	No. of days/ per week class allotted: 5	Semester From Date : 14/07/2025 to Date: 15/11/2025 No. of Weeks: 15
Week	Class Day	Theory/ Practical Topics
		SECTION A: WATER SUPPLY
		1 Introduction to Water Supply, Quantity and Quality of water
1ST	1	1.1 Necessity of treated water supply
	2	1.2 Per capita demand, variation in demand and factors affecting demand
	3	1.2 Per capita demand, variation in demand and factors affecting demand
	4	1.3 Methods of forecasting population, Numerical problems using different methods
	5	1.3 Methods of forecasting population, Numerical problems using different methods
2ND	1	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
	2	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
	3	1.5 Analysis of water –physical, chemical and bacteriological
	4	1.5 Analysis of water –physical, chemical and bacteriological
	5	1.6 Water quality standards for different uses
		2 Sources and Conveyance of water
3RD	1	2.1 Surface sources – Lake, stream, river and impounded reservoir
	2	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	3	2.3 Yield from well- method s of determination, Numerical problems using yield formulae (deduction
	4	2.3 Yield from well- method s of determination, Numerical problems using yield formulae (deduction
	5	2.4 Intakes – types, description of river intake, reservoir intake, canal intake
4TH	1	2.5 Pumps for conveyance & distribution – types, selection, installation.
	2	2.6 Pipe materials – necessity, suitability, merits & demerits of each type
	3	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes – method
		3 Treatment of water
	4	3.1 Flow diagram of conventional water treatment system
	5	3.2 Treatment process / units :3.2.1 Aeration ; Necessity
5TH	1	3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
	2	3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
	3	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash
	4	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash
	5	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure
6TH	1	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure
	2	3.2.5 Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand available chlorine, residual chlorine, pre-chlorination, break point chlorination, super-chlorination
	3	
	4	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange
	5	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange
		4 Distribution system And Appurtenance in distribution system:
7TH	1	4.1 General requirements, types of distribution system-gravity, direct and combined
	2	4.1 General requirements, types of distribution system-gravity, direct and combined
	3	4.2 Methods of supply – intermittent and continuous
	4	4.2 Methods of supply – intermittent and continuous
	5	4.3 Distribution system layout – types, comparison, suitability
8TH	1	4.3 Distribution system layout – types, comparison, suitability
	2	4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire
	3	4.4 Valves-types, features, uses, purpose-sluice valves, check valves, air valves, scour valves, Fire
		5 W/s plumbing in building :
	4	5.1 Method of connection from water mains to building supply
	5	5.2 General layout of plumbing arrangement for water supply in single storied and multi-storied building
		SECTION B: WASTE WATER ENGINEERING

		6 Introduction
9TH	1	6.1 Aims and objectives of sanitary engineering
	2	6.2 Definition of terms related to sanitary engineering
	3	6.2 Definition of terms related to sanitary engineering
	4	6.3 Systems of collection of wastes- Conservancy and Water Carriage System – features, comparison, suitability
	5	6.3 Systems of collection of wastes- Conservancy and Water Carriage System – features, comparison, suitability
		7 Quantity and Quality of sewage
10TH	1	7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.
	2	7.1 Quantity of sanitary sewage – domestic & industrial sewage, variation in sewage flow, numerical problem on computation quantity of sanitary sewage.
	3	7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring
	4	7.2 Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring
	5	7.3 General importance, strength of sewage, Characteristics of sewage-physical, chemical & biological
11TH	1	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
	2	7.4 Concept of sewage-sampling, tests for – solids, pH, dissolved oxygen, BOD, COD
		8 Sewerage system
	3	8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	4	8.1 Types of system-separate, combined, partially separate , features, comparison between the types, suitability
	5	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
12TH	1	8.2 Shapes of sewer – rectangular, circular, avoid-features, suitability
	2	8.3 Laying of sewer-setting out sewer alignment
		9 Sewer appurtenances and Sewage Disposal:
	3	9.1 Manholes and Lamp holes – types, features, location, function
	4	9.2 Inlets, Grease & oil trap – features, location, function
	5	9.3 Storm regulator, inverted siphon – features, location, function
13TH	1	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies
	2	9.4 Disposal on land – sewage farming, sewage application and dosing, sewage sickness-causes and remedies
	3	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
	4	9.5 Disposal by dilution – standards for disposal in different types of water bodies, self purification of stream
		10 Sewage treatment :
	5	10.1 Principles of treatment, flow diagram of conventional treatment
14TH	1	10.1 Principles of treatment, flow diagram of conventional treatment
	2	10.2 Primary treatment – necessity, principles, essential features, functions
	3	10.2 Primary treatment – necessity, principles, essential features, functions
	4	10.2 Primary treatment – necessity, principles, essential features, functions
	5	10.3 Secondary treatment – necessity, principles, essential features, functions
15TH	1	10.3 Secondary treatment – necessity, principles, essential features, functions
	2	10.3 Secondary treatment – necessity, principles, essential features, functions
		11 Sanitary plumbing for building :
	3	11.1 Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
	4	11.2 Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	5	11.3 Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets,


 8/7/2025.
 Lect. Stage- II
 Civil.


 14/07/2025
 H.O.D
 Dept. of Civil Engg.
 Govt. Polytechnic
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