

# LESSON PLAN OF 5<sup>TH</sup> SEMESTER(2023-24) CIVIL ENGINEERING

Discipline :- CIVIL Engg.	Semester:-5TH	Name of the Teaching Faculty JAYALAXMI BEHERA
Subject:- WS&WWE (Th-4)	No of Days/per Week Class Allotted :-04	Semester From:- 01.08.2023 To:- 30.11.2023 No of Weeks:- 18
Week	Class Day	Theory/ Practical Topics
1 <sup>st</sup>	1 <sup>st</sup>	1.1 Necessity of treated water supply
	2 <sup>nd</sup>	1.2 Per capita demand, variation in demand and factors affecting demand
	3 <sup>rd</sup>	1.3 Methods of forecasting population, Numerical problems using different methods
	4 <sup>th</sup>	1.4 Impurities in water – organic and inorganic, Harmful effects of impurities
2 <sup>nd</sup>	1 <sup>st</sup>	1.5 Analysis of water –physical, chemical and bacteriological
	2 <sup>nd</sup>	1.6 Water quality standards for different uses
	3 <sup>rd</sup>	2.1 Surface sources – Lake, stream, river and impounded reservoir
	4 <sup>th</sup>	2.2 Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
3 <sup>rd</sup>	1 <sup>st</sup>	2.3 Yield from well- method s of determination, Numerical problems using yield formulae ( deduction excluded)
	2 <sup>nd</sup>	2.4 Intakes – types, description of river intake, reservoir intake, canal intake
	3 <sup>rd</sup>	2.5 Pumps for conveyance & distribution – types, selection, installation.
	4 <sup>th</sup>	2.6 Pipe materials – necessity, suitability, merits & demerits of each type
4 <sup>th</sup>	1 <sup>st</sup>	2.7 Pipe joints – necessity, types of joints, suitability, methods of jointing Laying of pipes –method.
	2 <sup>nd</sup>	1. Design of treatment units excluded.
	3 <sup>rd</sup>	2. Students may be asked to prepare detailed sketches of units, preferably from working drawing, as home assignment
	4 <sup>th</sup>	3. Field visit to treatment plant, under practical should be arranged after covering this unit.
5 <sup>th</sup>	1 <sup>st</sup>	3.1 Flow diagram of conventional water treatment system
	2 <sup>nd</sup>	3.2 Treatment process / units : 3.2.1 Aeration ; Necessity
	3 <sup>rd</sup>	3.2.2 Plain Sedimentation : Necessity, working principles, Sedimentation tanks – types, essential features, operation & maintenance
	4 <sup>th</sup>	3.2.3 Sedimentation with coagulation: Necessity, principles of coagulation, types of coagulants, Flash Mixer, Flocculator, Clarifier (Definition and concept only)
6 <sup>th</sup>	1 <sup>st</sup>	3.2.4 Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
	2 <sup>nd</sup>	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 <sup>rd</sup>	3.2.6 Softening of water – Necessity, Methods of softening – Lime soda process and Ion exchange method (Concept Only)
	4 <sup>th</sup>	4.1 General requirements, types of distribution system-gravity, direct and combined
7 <sup>th</sup>	1 <sup>st</sup>	4.2 Methods of supply – intermittent and continuous
	2 <sup>nd</sup>	4.3 Distribution system layout – types, comparison, suitability
	3 <sup>rd</sup>	4.4 Valves-types, features, uses, purpose-slucice valves, check valves
	4 <sup>th</sup>	Air valves, scour valves, Fire hydrants, Water meters
8 <sup>th</sup>	1 <sup>st</sup>	5.1 Method of connection from water mains to building supply
	2 <sup>nd</sup>	5.2 General layout of plumbing arrangement for water supply in single storied

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