

**LESSON PLAN: (WATER SUPPLY & WASTE WATER
ENGINEERING)**

Discipline :	CIVIL ENGINEERING	
Faculty :	SUMAN PATEL	
Semester :	5TH	
Duration :	14 WEEKS (1ST AUGUST 2023 to 30TH NOVEMBER 2023)	
Work Load :	Lecture :	5 Lectures per week (50 minutes per Class)
Week	Week Day	Theory
1 st	1 st	Necessity of treated water supply
	2 nd	Per capita demand, variation in demand and factors affecting demand
	3 rd	Methods of forecasting population
	4 th	Methods of forecasting population
	5 th	Numerical problems using different methods
2 nd	6 th	Impurities in water – organic and inorganic,
	7 th	Harmful effects of impurities
	8 th	Analysis of water –physical,
	9 th	Analysis of water chemical and bacteriological
	10 th	Water quality standards for different uses
3 rd	11 th	Surface sources – Lake, stream, river and impounded reservoir
	12 th	Underground sources – aquifer type & occurrence – Infiltration gallery, infiltration well, springs, well
	13 th	Yield from well- method s of determination, Numerical problems using yield formulae (deduction excluded
	14 th	Intakes – types, description of river intake, reservoir intake, canal intake
	15 th	Pumps for conveyance & distribution – types, selection, installation
4 th	16 th	Pipe materials – necessity, suitability, merits & demerits of each ty
	17 th	Pipe joints – necessity, types of joints, suitability,
	18 th	Methods of jointing Laying of pipes – method
	19 th	<i>Design of treatment units excluded.</i>
	20 th	Flow diagram of conventional water treatment sys
5 th	21 st	Aeration ; Necessity
	22 nd	Plain Sedimentation : Necessity, working principles,
	23 rd	Sedimentation tanks – types, essential features, operation & maintenance
	24 th	Principles of coagulation, types of coagulants, Flash Mixer,
	25 th	Flocculator, Clarifier (Definition and concept only)
6 th	26 th	Filtration : Necessity, principles, types of filters Slow Sand Filter, Rapid Sand Filter and Pressure Filter – essential features
	27 th	Disinfection : Necessity, methods of disinfection Chlorination – free and combined chlorine demand, available chlorine,
	28 th	Residual chlorine, pre-chlorination, break point chlorination, super- chlorination
	29 th	Softening of water – Necessity, Methods of softening –
	30 th	Lime soda process and Ion exchange method (Concept Only)
7 th	31 st	General requirements, types of distribution system-gravity,
	32 nd	Types of distribution system direct and combined
	33 rd	Methods of supply – intermittent and continuous
	34 th	Distribution system layout – types, comparison, suitability Valves-types, features, uses
	35 th	Purpose-slucie valves, check valves

8 th	36 th	Air valves, scour valves,
	37 th	Fire hydrants, Water meters
	38 th	Method of connection from water mains to building supply
	39 th	General layout of plumbing arrangement for water supply in single storied and multi-storied building as per I.S. code.
	40 th	Aims and objectives of sanitary engineering
9 th	41 st	Definition of terms related to sanitary engineering
	42 nd	Systems of collection of wastes– Conservancy
	43 rd	Water Carriage System
	44 th	features, comparison, suitability
	45 th	Quantity of sanitary sewage – domestic & industrial sewage
10 th	46 th	Variation in sewage flow, numerical problem on computation quantity of sanitary sewage.
	47 th	Computation of size of sewer, application of Chazy's formula, Limiting velocities of flow : self-cleaning and scouring
	48 th	General importance, strength of sewage, Characteristics of sewage-physical,
	49 th	Characteristics of sewage chemical & biological
	50 th	Concept of sewage-sampling, tests for – solids, pH,
11 th	51 st	Dissolved oxygen, BOD, COD
	52 nd	Types of system-separate, combined, partially separate
	53 rd	Features, comparison between the types, suitability
	54 th	Shapes of sewer – rectangular, circular
	55 th	Avoid-features, suitability
12 th	56 rd	Laying of sewer-setting out sewer alignment
	57 th	Manholes and Lamp holes – types, features, location, function
	58 th	Inlets, Grease & oil trap – features, location, function
	59 th	Storm regulator, inverted siphon – features, location, function
	60 th	Disposal on land – sewage farming, sewage application
13 th	61 th	Dosing, sewage sickness-causes and remedies
	62 th	Disposal by dilution – standards for disposal in different types of water bodies,
	63 th	Self purification of stream
	64 th	Principles of treatment
	65 th	Flow diagram of conventional treatment
14 th	66 th	Primary treatment – necessity,
	67 th	Principles, essential features of primary treatment
	68 th	functions of primary treatment
	69 th	Secondary treatment – necessity
	70 th	Principles, essential features
	71 st	Functions of secondary treatment
	72 nd	Requirements of building drainage, layout of lavatory blocks in residential buildings, layout of building drainage
	73 rd	Plumbing arrangement of single storied & multi storied building as per I.S. code practice
	74 th	Sanitary fixtures – features, function, and maintenance and fixing of the fixtures – water closets
	75 th	Flushing cisterns, urinals, inspection chambers, traps, anti-syphonage pipe