Name of the Faculty :

Discipline : **Civil Engg.**

Semester : **4th Sem.**

Subject : **CONCRETE TECH.**

Lesson Plan Duration : **15 weeks**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1.	1	Introduction: Definition of concrete, properties of concrete, uses of concrete in comparison to other building materials	1.	To determine the Physical properties of cement as per IS Codes.
	2.	Advantages and disadvantages of concrete.		
	3.	2.Ingredients of Concrete2.1 Cement: physical properties of cement; different types of cement as per IS Codes		
2.	1.	Aggregates: 2.2.1 Classification of aggregates according to size and shape	2.	To determine Flakiness and elongation Index of coarse aggregates.
	2.	2.2.2 Characteristics of aggregates: Particle size and shape, surface texture, specific gravity of aggregate; bulk density, water absorption, surface moisture, bulking of sand, deleterious materials soundness		
	3.	2.2.3 Grading of aggregates: coarse aggregate, fine aggregate; All-in- aggregate; fineness modulus; interpretation of grading charts		
3.	1.	2.3 Water: Water Quality requirements as per IS:456-2000	3.	To determine Silt in fine aggregate.
	2.	3.Water Cement Ratio: 3.1 Hydration of cement principle of water-cement ratio, Duff Abram's Water-cement ratio law:		
	3.	Limitations of water-cement ratio law and its effects on strength of concrete		
4.	1.	4.Properties of Concrete 4.1 Properties in plastic state: Workability, Segregation,	4.	Determination of Specific gravity and water absorption of aggregates.
	2.	Bleeding and Harshness		

	3.	4.1.1Factors affecting workability, Measurement of workability: slump test, compacting factor and Vee Bee consistometer;		
5.	1.	Recommended slumps for placement in various conditions as per IS:456-2000/SP-23	5.	Determination of Bulk density and void of aggregates.
	2.	Properties in hardened state: Strength, Durability, Impermeability, Dimensional changes;		
	3.	5. Concrete Mix Design 5.1Objectives of mix design, introduction to various grades as per IS:456-2000; proportioning for nominal mix design as prescribed by IS 456-2000		
6.	1.	First Sessional and Assignment	6.	Determination of Particle size distribution of fine, coarse and all in aggregates by sieve analysis
	2.	5.2 Adjustment on site for: Bulking of fine aggregate, water absorption of aggregate, workability		
	3.	5.3 Difference between nominal and controlled concrete 5.4. Introduction to IS-10262-2009-Code for controlled mix design.		
7.	1.	6. Introduction to Admixtures (chemicals and minerals) for improving performance of concrete	7.	Revision
	2	DO		
	3.	7. Special Concretes (only features)		
8.	1.	7.1Concreting under special conditions, difficulties and precautions before, during and after concreting 7.1.1 Cold weather concreting 7.1.2 Under water concreting 7.1.3 Hot weather concreting	8.	Viva-voce
	2.	7.2 Ready mix concrete7.3 Fibre reinforced concrete		
	3.	7.4 Polymer Concrete 7.5 Fly ash concrete 7.6 Silica fume concrete		
9.	1.	8. Concreting Operations: 8.1 Storing of Cement: 8.1.1 Storing of cement in a warehouse 8.1.2 Storing of cement at site	9.	To determine necessary Adjustment for bulking of fine aggregates.

		8.1.3 Effect of storage on strength of cement		
	2.	8.1.4 Determination of warehouse capacity for storage of Cement		
	3.	8.2 Storing of Aggregate: Storing of aggregate at site		
10.	1.	8.3 Batching (to be shown during site visit) 8.3.1 Batching of Cement	10.	To determine workability by Slump test
	2.	8.3.2 Batching of aggregate by: 8.3.2.1 Volume, using gauge box (farma) selection of proper gauge box		
	3.	8.3.2.2 Weight spring balances and batching machines 8.3.3 Measurement of water		
11.	1.	8.4 Mixing: 8.4.1 Hand mixing 8.4.2 Machine mixing - types of mixers, capacities of mixers, choosing appropriate size of mixers, operation of mixers	11.	To verify the Effect of water, aggregate/cement ratio on slump
	2.	8.4.3 Maintenance and care of mixers		
	3.	Second Sessional and Assignment		
12.	1.	8.5 Transportation of concrete: Transportation of concrete using: wheel barrows, transit mixers, chutes, belt conveyors, pumps, tower crane and hoists etc.	12.	Compaction factor test for workability.
	2.	8.6 Placement of concrete: Checking of form work, shuttering and precautions to be taken during placement		
	3	8.7 Compaction: 8.7.1Hand compaction 8.7.2 Machine compaction - types of vibrators, internal screed vibrators and form vibrators 8.7.3 Selection of suitable vibrators for different situations		
13.	1.	8.8 Finishing concrete slabs - screeding, floating and trowelling	13.	Non destructive test on concrete.
	2.	8.9 Curing: 8.9.1Objective of curing, methods of curing like ponding, membrane curing, steam curing, chemical		

		curing 8.9.2 Duration for curing and removal of form work		
	3.	8.10 Jointing: Location of construction joints, treatment of construction joints, expansion joints in buildings - their importance and location		
14.	1.	8.11Defects in concrete: Identification of defects and methods of removing defects	14.	Tests for Compressive strength of concrete cubes.
	2.	9.Importance and methods of non-destructive tests (introduction only) 9.1. Rebound Hammer Test 9.2. Pulse Velocity method		
	3.	Revision		
15.	1	Assignment	15.	To determine flexural strength of Concrete beam.
	2	Third Sessional		
	3	Full Syllabus Test		

Name of the Faculty : DHEERAJ SAHNI

Discipline : **Civil Engg.**

Semester : **4th Sem.**

Subject : **Surveying**

Lesson Plan Duration : **15 weeks**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1.	1.	1Contouring Concept of contours, purpose of contouring, contour interval and horizontal equivalent		Preparing a Contour plan by radial line method
	2.	factors effecting contour interval, characteristics of contours, methods of contouring: Direct and indirect, use of stadia measurements in contour survey		-do-
2.	1.	interpolation of contours; use of contour map, Drawing cross section from a contour map; marking alignment of a road, railway and a canal on a contour map		Preparing a Contour plan by method of squares
	2.	computation of earth work and reservoir capacity from a contour map		-do-
3.	1.	2. Theodolite Surveying: Working of a transit vernier theodolite, axes of a theodolite and their relation; temporary adjustments of a transit theodolite; concept of transiting, swinging, face left, face right and changing face		Preparing a contour plan of Road/Railway track/canal by taking cross sections.
	2.	Measurement of horizontal and vertical angles. Prolonging a line (forward and backward) measurement of bearing of a line		-do-
4.	1.	traversing by included angles and deflection angle method; traversing by stadia measurement, theodolite triangulation, plotting a traverse		Basic about a theodolite
	2.	concept of coordinate and solution of omitted measurements (one side affected), errors in theodolite survey and precautions taken to minimize them;		Study of a transit vernier theodolite,Temp. adjustment of a Theodolite
5.	1.	Limits of precision in theodolite traversing.		Reading of a vernier and working out

		Height of objects – accessible and non-accessible bases 3.Tacho-metric surveying: Tachometry, Instruments to be used in tachometry, methods of tachometry Assignment		least count, measurement of horizontal angles by repetition and reiteration methods.
	2.	First Sessional		Measurement of vertical angles
6.	1.	Stadia system of tachometry, general principles of stadia tachometry, examples of stadia tachometry and Numerical problems.		Measurement of magnetic bearing of a line
	2.	DO		Running a closed traverse with a theodolite
7.	1.	4 Curves: 4.1 Simple Circular Curve: *Need and definition of a simple circular curve; Elements of simple circular curve - Degree of the curve, radius of the curve, tangent length, point of intersection (Apex point), tangent point		-DO-
	2.	length of curve, long chord deflection angle, Apex distance and Mid-ordinate. Setting out of simple circular curve:		To find the height of objects with and without accessible bases.
8.	1.	a) By linear measurements only: - Offsets from the tangent - Successive bisection of arcs - Offsets from the chord produced		Revision practice of theodolite
	2.	b)By tangential angles using a theodolite		-DO-
9.	1.	4.2 Transition Curve: Need (centrifugal force and super elevation) and definition of transition curve; requirements of transition curve;		Viva-voce
	2.	Assignment II		
10.	1.	Second Sessional		Setting out simple circular curve with offsets from the chords produced
	2.	length of transition curve for roads; by cubic parabola; calculation of offsets for a transition curve;		-do-
11.	1.	setting out of a transition curve by tangential offsets only		Setting out simple circular curve with [a] offsets from chord produced

				[b] one theodolite
	2.	4.3 Vertical curve Setting out of a vertical curve		-DO-
12.	1.	5.Introduction to the use of Modern Surveying equipment and techniques such as: a] EDM or Distomat		Use of minor instruments
	2.	b]Planimeter (Digital) c]Total station d]Introduction to remote sensing and GPS		Use of minor instruments
13.	1.	e] Auto level f]Digital theodolite		Use of minor instruments
	2.	Revision		Demonstration of digital instruments
14.	1.	DO		To plot the area with the help of Total Station
	2.	Assignment III		Field Visit
15.	1.	Third Sessional		Viva-voce and practice
	2.	Full Syllabus Test		Viva-voce and practice

Name of the Faculty: M.P.SINGH

Discipline : **Civil Engg.**

Semester : **4th Sem.**

Public Health and Irrigation

Subject : **Engg Drawing**

Lesson Plan

Duration : **15 weeks**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1.			1.	X-section of Standard types of open drains.
			2.	X-section of earthenware and RCC Sewer pipes.
2.			3.	X-section of masonry sewers[Circular and Egg shaped]
			4.	Detailed section of floor trap , gully trap
3.			5.	Detailed plan and section of an inspection chamber.
			6.	Detailed plan and section of a manhole
4.			7.	Detailed plan &X-section of a Domestic septic tank with soak pit for 5-10 users
			8.	DO
5.			9.	X-section through the external wall of lavatories at Ground and First Floor.
			10.	First Sessional
6.			11.	Plan of a bathroom showing positions of various fittings.
			12.	Draw Sectional elevation of a two storey building showing details of one pipe system and two pipe system
7.			13.	DO
			14.	Revision
8.			15.	Revision
			16.	Reading of working drawings
9.			17.	Reading of working drawings

			18.	L-section of a channel
10.			19.	Typical X-sections of various canal sections
			20.	Second Sessional
11.			21.	Plan of a canal head works
			22.	Typical L-section of a weir
12.			23.	X-section of an earthen dam
			24.	-do-
13.			25.	X-section of a tube-well
			26.	-do-
14.			27.	Layout and X-section of rain water harvesting System
			28.	Third Sessional
15.			29.	Revision
			30.	Viva-voce

Name of the Faculty :

Discipline : Civil Engg.

Semester : 4th Sem.

Subject : Structural Mechanics

Lesson Plan Duration : 15 weeks

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1.	1	1. Properties of Materials 1.1 Classification of materials, elastic materials, plastic materials, ductile materials, brittle materials.	1.	i)Determination of yield stress, ultimate stress, percentage elongation and plot the stress strain diagram and compute the value of young's modulus on mild steel
	2.	1.2 Introduction to tensile test, compressive test, impact test, fatigue test, torsion test on metals.		
	3.	2. Simple Stresses and Strains 2.1 Concept of stress, normal and shear stresses		
2.	1.	2.2 Concept of strain and deformation, longitudinal and transverse strain,	2.	DO
	2.	poisson's ratio, volumetric strain		
	3.	2.3 Hooke's law, modulii of elasticity and rigidity, Bulk modulus of elasticity, relationship between the elastic constants.		
3.	1.	2.4 Stresses and strains in bars subjected to tension and compression. Extension of uniform bar under its own weight	3.	ii)Testing of HYSD Steel
	2.	stress produced in compound bars (two or tPeriodsee) due to axial load		
	3.	2.5 Stress-strain diagram for mild steel and HYSD steel, mechanical properties, factor of safety.		
4.	1.	2.6 Temperature stresses and strains	4.	DO
	2.	3. Shear Force and Bending Moment: 3.1 Concept of a beam and supports		

		(Hinges, Roller and Fixed),		
	3.	types of beams: simply supported, cantilever, propped, over hang, cantilever and continuous beams (only concept).		
5.	1.	3.2 Types of loads (dead load, live load, snow load, wind load seismic load as per IS Codes etc) and types of loading (point, uniformly distributed and uniformly varying loads)	5.	iii)Determination of Young's modulus of elasticity for steel wire with searl's apparatus
	2.	Assignment		
	3.	First Sessional		
6.	1.	3.3 Concept of bending moment and shear force, sign conventions	6.	DO
	2.	3.4 Bending Moment and shear force diagrams for cantilever, simply supported and overhanging beams subjected to concentrated, uniformly distributed		
	3.	DO		
7.	1.	3.5Relationship between load, shear force and bending moment, point of maximum bending moment, and point of contraflexure.	7.	iv) Determination of modulus of rupture of a concrete beam
	2.	DO		
	3.	4.Moment of Inertia: Concept of moment of inertia and second moment of area and radius of gyration, theorems of parallel and perpendicular axis		
8.	1.	Second moment of area of common geometrical sections: rectangle, triangle, circle *(without derivations).*	8.	DO
	2.	Second moment of area for L, T and I sections, section modulus.		
	3.	5.Bending Stresses in Beams: 5.1 Concept of pure/simple bending		
9.	1.	5.2 Assumptions made in the theory of simple bending, derivation and application of bending equation to circular cross-section, I section, T&L sections only	9.	v)Determination of maximum deflection and young's modulus of elasticity in simply supported beam with load at middle third point

	2.	Moment of resistance Calculations of bending stresses in simply supported beam		
	3.	6.Shear Stresses in Beams 6.1Concept of shear stresses in beams,		
10.	1.	shear stress distribution in rectangular, circular I, T, L sections for S.S. beams and Portland	10.	DO
	2.	Assignment II		
	3.	Second Sessional		
11.	1.	7.Slope and Deflection:Determination of slope and deflection using Moment Area Theorem for simply supported beam for pointed load and U.D.L.(no derivation, numerical problems)	11.	DO
	2.	DO		
	3.	DO		
12	1.	8.Columns: 8.1Theory of columns	12.	vi)Verification of forces in a framed structure
	2.	8.2 Problem solving using Eulers and Rankine Formula		
.	3	9.Analysis of Trusses: 9.1Concept of a perfect, redundant and deficient frames		
13.	1.	9.2 Assumptions and analysis of trusses by: a) Method of joints	13.	DO
	2.	b)Method of sections		
	3.	DO		
14.	1.	Assignment III	14.	DO
	2.	Revision		
	3.	Third Sessional		
15.	1.	Revision	15.	Revision
	2.	DO		
	3.	Full Syllabus Test		

Name of the Faculty : Rakesh Kumar

Discipline : **Civil Engg.**

Semester : **4th Sem.**

Subject : **Reinforced Concrete Design**

Lesson Plan Duration : **15 weeks**

Week	Theory	
	Lecture Day	**Topic (including assignment / test)**
1.	1	1.Introduction 1.1Concept of Reinforced Cement Concrete (RCC) 1.2 Reinforcement Materials: Suitability of steel as reinforcing material Properties of mild steel and HYSD steel
	2.	1.3.Loading on structures as per IS: 875
	3.	2.Introduction to following methods of RCC design 2.1 Working stress method: Definition and basic assumptions
2.	1.	2.2 Limit state method: Definition and basic assumptions
	2.	3.Shear and Development Length Shear as per IS:456-2000 by working stress method i)Shear strength of concrete without shear reinforcement
	3.	ii)Maximum shear stress iii]Shear reinforcement
3.	1.	4.Concept of Limit State Method 4.1.Definitions and assumptions made in limit state of collapse (flexure)
	2.	4.2. Partial factor of safety for materials 4.3. Partial factor of safety for loads
	3.	4.4. Design loads 4.5. Stress block, parameters
4.	1.	5.Singly Reinforced beam : Theory and design of singly reinforced beam by Limit State Method
	2.	DO
	3.	DO
5.	1.	DO
	2.	DO
	3.	DO

6.	1.	First Sessional
	2.	6.Doubly Reinforced Beams: Theory and design of simply supported doubly reinforced rectangular beam by Limit State Method
	3.	DO
7.	1.	DO
	2.	DO
	3.	DO
8.	1.	DO
	2.	DO
	3.	7. Behaviour of T beam, inverted T beam, isolated T beam and 'L' beams (No Numericals)
9.	1.	8. One Way Slab:Theory and design of simply supported one way slab including sketches showing reinforcement details (plan and section) by Limit State Method..
	2.	DO
	3.	DO
10.	1.	DO
	2.	DO
	3.	DO
11.	1.	Second Sessional
	2.	9.Two Way Slab: Theory and design of two-way simply supported slab with corners free to lift, no provisions for torsional reinforcement by Limit State Method including sketches showing reinforcement details (plan and two sections)
	3.	DO
12.	1.	DO
	2.	DO
	3	DO
13.	1.	10.Axially Loaded Column 10.1 Definition and classification of columns 10.2. Effective length of column, 10.3. Specifications for longitudinal and lateral reinforcement
	2.	DO
	3.	10.4.Design of axially loaded square, rectangular and circular short columns by Limit State Method including sketching of reinforcement(sectional elevation and plan)
14.	1.	DO
	2.	11Pre-stressed Concrete 11.1 Concept of pre-stressed concrete 11.2 Methods of pre-stressing : pre-tensioning and post-tensioning

	3.	11.3 Advantages and disadvantages of pre-stressing 11.4 Losses in pre-stress
15.	1.	Revision
	2.	Third Sessional
	3.	Full Syllabus Test

Name of the Faculty :

Discipline : Civil Engg.

Semester : 4th Sem.

Subject : Irrigation Engineering

Lesson Plan Duration : 15 weeks

Week	Theory	
	Lecture Day	**Topic (including assignment / test)**
1.	1	1. Introduction: 1.1 Definition of irrigation 1.2 Necessity of irrigation
	2.	1.3 History of development of irrigation in India 1.4 Major, medium and minor irrigation projects
	3.	2. Water Requirement of Crops 2.1 Principal crops in India and their water requirements 2.2 Crop seasons – Kharif and Rabi
2.	1.	2.3 Soil water, soil crop and crop water relationships, Duty, Delta and Base Period, their relationship
	2.	2.4 Gross commanded area (GCA), culturable commanded area (CCA), Intensity of Irrigation, Irrigable area
	3.	3. Hydrological Cycle Catchment Area and Run-off Rainfall , definition rain-gauges – automatic and non-automatic,
3.	1.	methods of estimating average rainfall (Arithmatic system)
	2.	catchment area runoff, factors affecting runoff, hydrograph, basic concept of unit hydrograph.
	3.	4.Methods of Irrigation 4.1 Flow irrigation - its advantages and limitations
4.	1.	4.2 Lift Irrigation – Tubewell, submersible and well irrigation advantages and disadvantages
	2.	4.3 Drip irrigation, suitability of drip irrigation, layout, component parts, advantages
	3.	5.Canals 5.1 Classification, appurtenances of a canal and their functions, sketches of different canal cross-sections

5.	1.	5.2 Various types of canal lining - their related advantages and disadvantages, sketches of different lined canal x-sections
	2.	5.3 Breaches and their control
	3.	5.4 Maintenance of lined and unlined canals
6.	1.	Assignment
	2.	First Sessional
	3.	6. Tube Well Irrigation: 6.1Introduction, occurrence of ground water, location and command, advantages and disadvantages, comparison with canal irrigation
7.	1.	6.2 Tube wells, explanation of terms: water table, radius of influence, depression head, cone of depression, confined and unconfined aquifers. Yield of a well and methods of determining yield of well
	2.	6.3 Types of tube wells and their choice-cavity, strainer and slotted type;
	3.	6.4Method of boring, installation of well assembly, development of well, pump selection and installation and maintenance
8.	1.	6.5Water Harvesting Techniques: Need and requirement of various methods, Run-off from roof top and ground surface, construction of recharge pits and recharge wells and their maintenance.
	2.	7. Dams7.1 Classification of dams; earth dams - types, causes of failure; cross-section of zoned earth dam, method of construction, gravity dams – types, cross-sections of a dam, method of construction
	3.	7.2 Concept of small and micro dams
9.	1.	7.3 Concept of spillways and energy dissipators
	2.	8. Canal Head Works and Regulatory Works Definition, object, general layout, functions of different parts of head works.
	3.	Difference between weir and barrage
10.	1.	9 Cross Drainage Works 9.1 Functions and necessity of the following types: aqueduct, super passage, level crossing, inlet and outlet
	2.	9.2 Sketches of the above cross drainage works
	3.	Assignment II

11.	1.	Second Sessional
	2.	10 Definitions of following Hydraulic Structures with Sketches10.1 Falls10.2 Cross and head regulators
	3.	10.3 Outlets 10.4 Canal Escapes
12.	1.	11. River Training Works Methods of river training, guide banks, retired (levees) embankments
	2.	groynes and spurs, pitched island, cut-off
	3	12. Water Logging and Drainage and Ground Water Re-charge 12.1Definition of water logging – its causes and effects, detection,
13.	1.	prevention and remedies
	2.	12.2 Surface and sub-surface drains and their layout
	3.	12.3 Concept and various techniques used for ground water re-charge
14.	1.	Assignment III
	2.	Third Sessional
	3.	Revision
15.	1.	DO
	2.	DO
	3.	Full Syllabus Test

Name of the Faculty :

Discipline : **Civil Engg.**

Semester : **4th Sem.**

Subject : **Public Health Engg**

Lesson Plan Duration : **15 weeks**

Week	Theory		Practical	
	Lecture Day	Topic (including assignment / test)	Practical Day	Topic
1.	1	1.Introduction 1.1Necessity and brief description of water supply system. 1.2 Sources of water – surface/sub-surface sources	1.	1) To determine turbidity of water sample
	2.	2 Quantity of Water 2.1 Water requirement		
	3.	2.2 Rate of demand and variation in rate of demand		
2.	1.	2.3 Per capita consumption for domestic, industrial, public and fire fighting uses as per BIS standards (no numerical problems)	2.	2) To determine dissolved oxygen of given sample
	2.	2.4 Population Forecasting		
	3.	3. Quality of Water 3.1 Meaning of pure water and methods of analysis of water		
3.	1.	3.2 Physical, Chemical and bacteriological tests and their significance	3.	3) To determine pH value of water
	2.	3.3 Standard of potable water as per Indian Standard		
	3.	3.4 Maintenance of purity of water		

4.	1.	4. Water Treatment (brief introduction) 4.1 Sedimentation - purpose, types of sedimentation tanks	4.	4) To perform jar test for coagulation
	2.	4.2 Coagulation/floculation - usual coagulation and their feeding		
	3.	4.3 Filtration - significance, types of filters, their suitability		
5.	1.	4.4 Necessity of disinfection of water, forms of chlorination, break point chlorine, residual chlorine, application of chlorine.	5.	5)To determine BOD of given sample
	2.	4.5 Flow diagram of different treatment units, functions of (i) Areation fountain (ii) mixer (iii) floculator, (iv) classifier, (v) slow and rapid sand filters (vi) chlorination chamber.		
	3.	Assignment I		
6.	1.	First Sessional	6.	6) To determine residual chlorine in water
	2.	5. Conveyance of Water 5.1 Different types of pipes - cast iron, PVC, steel, asbestos cement, concrete and lead pipes. Their suitability and uses, types of joints in different types of pipes.		
	3.	5.2 Appurtenances: Sluice, air, reflux valves, relief valves, scour valves, bib cocks, stop cocks,		
7.	1.	fire hydrants, water meters their working and uses	7.	7) To determine conductivity of water and total dissolved solids
	2	6. Laying of Pipes 6.1 Setting out alignment of pipes 6.2 Excavation for laying of pipes and precautions to be taken		

	3.	6.3 Handling, lowering and jointing of pipes 6.4 Testing of pipe lines		
8.	1.	6.5 Back filling 7.Building Water Supply 7.1 Connections to water main (practical aspect only)	8.	8) To study the installation of following: a) Water meter b) Connection of water supply of building with main
	2.	7.2 Water supply fittings (with sketches) and terminology related to plumbing		
	3.	**B. WASTE WATER ENGINEERING** 8.Introduction 8.1Purpose of sanitation 8.2 Necessity of systematic collection and disposal of waste		
9.	1.	8.3 Definition of terms in sanitary engineering 8.4 Collection and conveyance of sewage	9.	c) Pipe valves and bends d) Water supply and sanitary fittings
	2.	8.5 Conservancy and water carriage systems, their advantages and Disadvantages 8.6 (a) Surface drains (only sketches) : various types, suitability (b) Types of sewage: Domestic, industrial, storm water and its seasonal variation		
	3.	9. Sewerage System 9.1 Types of sewerage systems, materials for sewers, their sizes and joints 9.2 Appurtenance: Location, function and construction features. Manholes,		
10.	1.	drop manholes, tank hole, catch basin, inverted siphon, flushing tanks grease and oil traps, storm regulators, ventilating shafts	10.	9) To study and demonstrate the joining/tPeriodseading of GI Pipes, CI Pipes, SWG pipes, PVC pipes and copper pipes.
	2.	10. Laying and Construction of Sewers: 10.1Setting out/alignment of sewers 10.2 Excavations, checking the gradient with boning rods preparation of bedding, handling and jointing		

		testing and back filling of sewers/pipes.		
	3.	10.3 Construction of surface drains and different sections required		
11.	1.	Assignment II	11.	10) To demonstrate the laying of SWG pipes for sewers
	2.	Second Sessional		
	3.	11Sewage Characteristics: 11.1Properties of sewage and IS standards for analysis of sewage		
12.	1.	11.2 Physical, chemical and bacteriological parameters	12	11)Study of water purifying process by visiting a field lab
	2.	12. Natural Methods of Sewerage Disposal 12.1 General composition of sewage and disposal methods 12.2 Disposal by dilution		
	3	12.3 Self purification of stream 12.4 Disposal by land treatment 12.5 Nuisance due to disposal		
13.	1.	13. Sewage Treatment 13.1 Meaning and principle of primary and secondary treatment and activated sludge process their flow diagrams	13.	12) Demonstration of plumbing tools
	2.	13.2 Introduction and uses of screens, grit chambers, detritus tanks, skimming tanks, plainsedimentation tanks, primary clarifers, secondary clarifers, filters, control beds		
	3.	intermittent sand filters, trickling filters, sludge treatment and disposal, oxidation ponds (Visit to a sewage treatment plant)		
	1.	14. Building Drainage	14.	

14.		14.1 Aims of building drainage and its requirements		
	2.	14.2 Different sanitary fittings and installations 14.3 Traps		
	3.	Assignment III		
15.	1	Third Sessional	15.	
	2	Revision		
	3	Full Syllabus		