Name of the Faculty : **Mrs. ANJU (Theory, Practical)**

Discipline : **(Civil Engineering)**

Semester : **4TH**

Subject : **CONCRETE TECHNOLOGY**

Lesson plan Duration : **15 weeks(from January, 2018)**

Workload per week in hours : **Lectures-03, Practicals-02**

Week	Theory		Practical	
	Lecture Day	Topic(including assignment test)	Practical Day	Topic
1st	1	Introduction: Definition of concrete	1st	To determine the physical properties of cement as per IS Codes
	2	uses of concrete in comparison to other building materials.		
	3	kinematics inversion, equivalent linkagesspecific volume, capillarity, specific gravity, viscosity, compressibility,		
2nd	4	Cement: physical properties of cement; different types of cement as per IS Codes	2nd	To determine flakiness and elongation index of coarse aggregates
	5	Classification of aggregates according to size and shape		
	6	Characteristics of aggregates: Particle size and shape, surface texture, specific gravity of aggregate;		
3rd	7	bulk density, water absorption, surface moisture, bulking of sand, deleterious materials,	3rd	To determine silt in fine aggregate
	8	Grading of aggregates: coarse aggregate, fine aggregate; All-in-aggregate; fineness modulus; interpretation of grading charts		
	9	Test		
4th	10	Water: Quality requirements as per IS:456-2000	4th	Determination of specific gravity and water absorption of aggregates
	11	Hydration of cement, principle of water-cement ratio, Duff Abram's Water-cement ratio law:		
	12	Limitations of water-cement ratio law and its effects on strength of concrete		
5th	13	Workability factors affecting workability, Measurement of workability: slump test	5th	Determination of bulk density and voids of aggregates.
	14	Assignment		

	15	compacting factor and Vee Bee consistometer; Recommended slumps for placement in various conditions as per IS:456-2000/SP-23		
6th	**16**	Properties in plastic state: Workability, Segregation, Bleeding and Harshness	**6th**	To determine surface moisture in fine aggregate by displacement method
	17	Properties in hardened state: Strength, Durability, Impermeability, Dimensional changes;		
	18	Objectives of mix design, introduction to various grades as per IS:456- 2000; proportioning for nominal mix design as prescribed by IS 456-2000		
7th	**19**	Adjustment on site for: Bulking of fine aggregate, water absorption of aggregate, workability	**7th**	Determination of particle size distribution of fine, coarse and all in aggregate by sieve analysis (grading of aggregate)
	20	Test		
	21	Difference between nominal and controlled concrete		
8th	**22**	Introduction to Admixtures (chemicals and minerals) for improving performance of concrete	**8th**	To determine necessary adjustment for bulking of fine aggregate
	23	Concreting under special conditions, difficulties and precautions before, during and after concreting		
	24	Assignment		
9th	**25**	Cold weather concreting, Under water concreting , Hot weather concreting	**9th**	To determine workability by slump test:
	26	Ready mix concrete , Fibre reinforced concrete , Polymer Concrete		
	27	Storing of Cement: , Storing of cement in a warehouse ,Storing of cement at site , Effect of storage on strength of cement ,Determination of warehouse capacity for storage of Cement		
10th	**28**	Storing of Aggregate: Storing of aggregate	**10th**	To verify the effect of water, fine aggregate/coarse aggregate ratio and aggregate/Cement ratio on slump
	29	Batching of Cement , Batching of aggregate by: Volume, using gauge box (farma) selection of proper gauge box		
	30	Batching of Cement , Batching of aggregate by: Volume, using gauge box (farma) selection of proper gauge box		
11th	**31**	Hand mixing ,Machine mixing - types of mixers, capacities of mixers, choosing appropriate size of mixers, operation of mixers	**11th**	Compaction factor test for workability
	32	Maintenance and care of machines		

	33	Transportation of concrete: Transportation of concrete using: wheel barrows, transit mixers, chutes, belt conveyors, pumps, tower crane and hoists etc.		
12th	**34**	Placement of concrete:	**12th**	Rebound Hammer Test
	35	Compaction:		
	36	Machine compaction - types of vibrators, internal screed vibrators and form vibrators		
13th	**37**	Selection of suitable vibrators for different situations	**13th**	Ultrasonic Pulse Velocity Test
	38	Finishing concrete slabs - screeding, floating and trowelling		
	39	Objectives of curing, methods of curing		
14th	**40**	Duration for curing and removal of form work.	**14th**	Tests for compressive strength of concrete cubes for different grades of concrete
	41	Jointing: Location of construction joints, treatment of construction joints, expansion joints in buildings - their importance and location		
	42	Defects in concrete: Identification of and methods of repair		
15th	**43**	Importance and methods of non-destructive tests (introduction only)	**15th**	Test
	44	Assignment		
	45	Test		

Lesson Plan

Name of Faculty : Yet To be Assigned

Discipline : Civil Engg.

Semester : 4th

Subject : I.E.

Lesson Plan Duration : 75

Work Load (Lecture /Practical) per week in hours : Lecture : 5 Practical

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
Ist	1	1. Introduction: 1.1 Definition of irrigation		
	2	1.2 History of development of irrigation in India		
	3	1.3 Necessity of irrigation		
	4	1.4 Major, medium and minor irrigation projects		
	5	2. Water Requirement of Crops		
2nd	1	2.1 Principal crops in India and their water requirements		
	2	2.2 Crop seasons – Kharif and Rabi		
	3	2.3 Soil water, soil crop and water relationships, duty, delta		
	4	and base period, their relationship		
	5	2.4 Gross commanded area (GCA),		
3rd	1	culturable commanded area (CCA),		
	2	intensity of irrigation, irrigable area		
	3 4	3. Hydrological Cycle Catchment Area		

		and Run-off (06 hrs) Rainfall ,		
	5	definition rain-gauges – automatic and non-automatic,		
4th	1	methods of estimating average rainfall (Arithmatic system);		
	2	4. Methods of Irrigation (07 hrs)		
	3	4.1 Flow irrigation - its advantages and limitations		
	4	4.2 Lift Irrigation – Tube well and open well irrigation, their advantages and		
	5	disadvantages		
		4.3 Sprinkler irrigation conditions favourable and essential requirements for sprinkler irrigation, sprinkler system – classification and component parts		
		4.4 Drip irrigation, suitability of drip irrigation, layout, component parts, advantages		
5th	1	5. Canals (08 hrs)		
	2	5.1 Classification, apurtenancs of a canal and their functions,		
	3	sketches of different canal cross-sections (unlined)		
	4	5.2 Various types of canal lining - their related advantages and disadvantages		
	5	, sketches of different lined canal x-sections		
6th	1	5.3 Breaches and		
	2	their control		
	3	5.4 Maintenance of lined and unlined canals		
		6. Tube Well Irrigation (09 hrs)		

	4			
	5	6.1 Introduction, occurrence of ground water, location and command,		
7th	1	advantages and disadvantages, comparison with canal irrigation 6.2 Tube wells,		
	2	explanation of terms: water table, radius of influence,		
	3	depression head, cone of depression, confined and unconfined aquifers.		
	4	Yield of a well and methods of determining yield of well		
	5	6.3 Types of tube wells, cavity, strainer and slotted type;		
8th	1	6.4 Method of boring, installation of well assembly,		
	2	development of well, pump selection and installation and maintenance		
	3	6.5 Water Harvesting Techniques: Need and requirement of various methods,		
	4	Run-off from roof top and ground surface,		
	5	construction of recharge pits and recharge wells and their maintenance.		
9th	1	7. Dams (07 hrs) 7.1 Classification of dams; earthen dams -		
	2	types, causes of failure;		
	3	crosssection of zoned earthen dams,		
	4	method of construction, gravity dams – types, cross-sections of a dam, method of		

	5	construction		
		7.2 Concept of small and micro dams		
10th	1	7.3 Concept of spillways and energy dissipators		
	2			
	3	8. Canal Head Works and Regulatory Works		
	4			
	5	Definition, object, general layout, functions of different parts of head works.		
		Difference between weir and barrage		
		9. Cross Drainage Works		
11th	1	(04 hrs) 9.1 Functions and necessity of the following types: aqueduct,		
	2	super passage,		
	3	level crossing, inlet and outlet, pipe crossing		
		9.2 Sketches of the above cross drainage works		
	4	10. Definitions of following Hydraulic Structures with Sketches (02 hrs)		
	5			
12th	1	10.1 Falls		
	2	10.2 Cross and head regulators		
	3	10.3 Outlets		
	4			

		10.4 Canal Escapes		
	5	11. River Training Works (04 hrs)		
13th	**1**	Methods of river training,		
	2	guide banks,		
	3	retired (levees) embankments,		
	4	groynes and spurs,		
	5	pitched island,		
14th	1	cut-off		
	2	12.1 Definition of water logging –		
	3	12. Water Logging and Drainage and Ground Water Re-charge (03 hrs)		
	4	its causes and effects, detection, prevention		
	5	and remedies		
15th	1 2 3 4 5	12.2 Reclamation of soil 12.3 Surface and sub-surface drains and their layout 12.4 Concept and various techniques used for ground water re-charge		

(Signature of the teacher concerned with date)

Name of the Faculty : **Mr. Md Danish (Theory)**

Discipline : **(Civil Engineering)**

Semester : **4th**

Subject : REINFORCEMENT CEMENT CONCRETE(RCC)

Lesson plan Duration : **15 weeks(from January, 2018)**

Workload per week in hours : **Lectures-06**

Week	Theory	
	Lecture Day	**Topic(including assignment test)**
1st	**1**	Concept of Reinforced Cement Concrete (RCC) 1.2 Reinforcement Materials:
	2	Suitability of steel as reinforcing material - Properties of mild steel and HYSD steel 1.3. Loading on structures as per IS: 875
	3	ntroduction to following methods of RCC design 2.1 Working stress method
	4	2.2 Limit state method
	5	Shear as per IS:456-2000 by working stress method i) Shear strength of concrete without shear reinforcemen
	6	ii) Maximum shear stress iii) Shear reinforcement
2nd	**7**	Basic assumptions and stress strain curve, neutral axis, balanced
	8	underreinforcement and over reinforced beams, Moment of resistance for singly reinforced beam.
	9	Design of singly reinforced beam including sketches showing reinforcement details.
	10	Numerical
	11	Numerical
	12	Numerical
3rd	**13**	Numerical
	14	Definitions and assumptions made in limit state of collapse (flexure)
	15	Partial factor of safety for materials
	16	Partial factor of safetyfor loads
	17	Design loads
	18	Stres block, parameters
4th	**19**	Singly Reinforced beam

	20	Theory and design of singly reinforced beam by Limit State Method
	21	Numerical
	22	Numerical
	23	Numerical
	24	Numerical
5th	**25**	Test
	26	Assignment
	27	Doubly Reinforced Beams
	28	Theory and design of simply supported doubly reinforced rectangular beam by Limit State Method
	29	Numerical
	30	Numerical
6th	**31**	Numerical
	32	Numerical
	33	Numerical
	34	Behaviour of T beam, inverted T beam,
	35	isolated T beam and 'L' beam
	36	Revision
7th	**37**	One Way Slab
	38	Theory and design of simply supported one way slab including sketches showing reinforcement details (plan and section) by Limit State Method
	39	Numerical
	40	Numerical
	41	Numerical
	42	Numerical
8th	**40**	Numerical
	41	Numerical
	42	Assignment
	43	Two Way Slab
	44	Theory and design of two-way simply supported slab with corners free to lif
	45	no provisions for torsional reinforcement by Limit State Method including sketches showing reinforcement details (plan and two sections)

	46	Numerical
	47	Numerical
	48	Numerical
9th	**49**	Numerical
	50	Numerical
	51	Numerical
	52	Numerical
	53	Assignment
	54	Test
10th	**55**	Axially Loaded Column
	56	Definition and classification of column
	57	Effective length of column
	58	Specifications for longitudinal and lateral reinforcement
	59	Design of axially loaded square, rectangular and circular short columns by Limit State Method including sketching of reinforcement(sectional elevation and plan)
	60	Numerical
11th	**61**	Numerical
	62	Numerical
	63	Numerical
	64	Numerical
	65	Numerical
	66	Numerical
12th	**67**	Numerical
	68	Numerical
	69	Numerical
	70	Numerical
	71	Numerical
	72	Numerical
13th	**73**	Numerical
	74	Numerical
	75	Numerical
	76	Numerical

	77	Numerical
	78	Numerical
14th	**79**	Prestressed Concrete
	80	. Concept of pre-stressed concrete
	81	Methods of pre-stressing : pre-tensioning and post tensioning
	82	Advantages and disadvantages of prestressing
	83	Losses in pre-stress
	84	Revision
15th	**85**	Revision
	86	Revision
	87	Revision
	88	Revision
	89	Test
	90	Assignment

Name of the Faculty : **Mr. Yogender Rajan (Theory, Practical)**

Discipline : **(Civil Engineering)**

Semester : **4TH**

Subject : **Survey**

Lesson plan Duration : **15 weeks(from January, 2018)**

Workload per week in hours : **Lectures-03, Practicals-06S**

Week	Theory		Practical	
	Lecture Day	Topic(including assignment test)	Practical Day	Topic
1st	1	Concept of contours, purpose of contouring, contour interval and horizontal equivalent	1st	i) Preparing a contour plan by radial line method by the use of a Tangent Clinometer/Tachometer
	2	factors effecting contour interval, characteristics of contours, methods of contouring: Direct and indirect		
	3	use of stadia measurements in contour survey		
2nd	4	interpolation of contours	2nd	Preparing a contour plan by method of squares
	5	use of contour map, Drawing cross section from a contour map		
	6	marking alignment of a road, railway and a canal on a contour map		
3rd	7	computation of earth work and reservoir capacity from a contour map	3rd	Preparing a contour plan of a Road/Railway track/Canal by taking cross sections.
	8	Working of a transit vernier theodolite, axes of a theodolite and their relation;		
	9	temporary adjustments of a transit theodolite; concept of transiting		
4th	10	swinging, face left, face right and changing face	4th	Taking out the Theodilite, mounting on the tripod and placing it back in the box
	11	measurement of horizontal and vertical angles. Prolonging a line (forward and backward) measurement of bearing of a line		
	12	traversing by included angles and deflection angle method; traversing by stadia measurement		
5th	13	theodolite triangulation, plotting a traverse; concept of coordinate and solution of omitted measurements (one side affected)	5th	Study of a transit vernier theodolite; temporary adjustments of theodolite
	14	errors in theodolite survey and precautions taken to minimize them		
	15	limits of precision in theodolite traversing. Height of objects		

6th	**16**	accessible and non-accessible bases	**6th**	Reading the vernier and working out the least count, measurement of horizontal angles by repetition and reiteration methods
	17	Assignment		
	18	Test		
7th	**19**	Tachometry	**7th**	Measurement of vertical angles and use of tachometric tables
	20	Instruments to be used in tachometry, methods of tachometry,		
	21	stadia system of tachometry		
8th	**22**	general principles of stadia tachometry	**8th**	Measurement of magnetic bearing of a line
	23	examples of stadia tachometry and Numerical problems		
	24	Simple Circular Curve		
9th	**25**	Elements of simple circular curve - Degree of the curve	**9th**	Running a closed traverse with a theodolite (at least five sides) and its plotting
	26	radius of the curve, tangent length, point of intersection (Apex point)		
	27	tangent point, length of curve, long chord deflection angle, Apex distance and Mid-ordinate		
10th	**28**	Setting out of simple circular curve: a) By linear measurements only: - Offsets from the tangent - Successive bisection of arcs	**10th**	Height of objects with and without accessible base
	29	Offsets from the chord produced b) By tangential angles using a theodolite		
	30	Transition Curve: Need (centrifugal force and super elevation) and definition of transition curve		
11th	**31**	requirements of transition curve	**11th**	Setting out of a simple circular curve with given data by the following methods a) Offsets from the chords produced b) One theodolite method
	32	Assignment		
	33	Test		
12th	**34**	length of transition curve for roads; by cubic parabola	**12th**	Demonstration and use of minor instruments like Ceylon Ghat Tracer, Tangent Clinometer, Pantagraph, Abney level etc
	35	calculation of offsets for a transition curve		
	36	setting out of a transition curve by tangential offsets only ,		
13th	**37**	Vertical curve Setting out of a vertical curve	**13th**	Use of planimeter for computing areas
	38	Introduction to the use of Modern Surveying equipment and techniques such as		
	39	A)EDM or Distomat b) Planimeter		

14th	**40**	c) Total station d) Introduction to remote sensing, GIS and GPS	**14th**	Demonstration of digital instruments through field visits to Survey of India and other government agencies.
	41	Minor Instruments		
	42	Introduction and use of minor instruments like Ceylon Ghat Tracer, Clinometer, Pantagraph, Abney Level etc.		
15th	**43**	Use of planimeter for computing areas	**15th**	Total Station (only demonstrations).
	44	Assignment		
	45	Test		

Lesson Plan

Name of Faculty : Yet To Be Assigned

Discipline : civil Engg.

Semester : 4th

Subject : W.E.

Lesson Plan Duration : 75

Work Load (Lecture /Practical) per week in hours : Lecture : 5 Practical : 3

Week	Theory		Practical	
	Lecture Day	Topic (Including assignment/test)	Practical Day	Topic
Ist	1	1. Introduction (02 hrs)		
	2	1.1 Necessity and brief description of water supply system.		
	3	2. Quantity of Water (06 hrs)		
	4	2.1 Water requirement		
	5	2.2 Rate of demand		
2nd	1	and variation in rate of demand		1) To determine turbidity of water sample
		2.3 Per capita consumption for domestic		
	2	, industrial, public and fire fighting		
		uses as per BIS standards (no numerical problems)		
	3	2.4 Population Forecasting		
	4			
	5			
3rd	1	3. Quality of Water (04 hrs) 3.1 Meaning of pure water and methods of analysis of water		

	2			
		3.2 Physical,		
		Chemical and bacteriological tests and their significance		
	3	3.3 Standard of potable water as per Indian Standard		
		3.4 Maintenance of purity of water (small scale and large scale quantity)		
	4			
	5			
4th	1	4. Water Treatment (brief introduction)		2) To determine dissolved oxygen of given sample
	2	**4.1 Sedimentation - purpose,		
	3	types of sedimentation tanks		
	4	**4.2 Coagulation floculation - usual coagulation and their feeding		
	5	**4.3 Filtration - significance,		
5th	1	types of filters, their suitability		
	2	4.4 Necessity of disinfection of water, forms of chlorination, break point		
	3	chlorine, residual chlorine,		
		application of chlorine.		
	4	4.5 Flow diagram of different treatment units, functions of (i) Areation		
	5	fountain		
6th	1	(ii) mixer (iii) floculator,		
		(iv) classifier, (v) slow and rapid sand		
	2	Filters		3) To determine pH value of water
	3	(vi) chlorination chamber.		
		5. Conveyance of Water (09 hrs)		
	4	**5.1 Different types of pipes - cast iron, PVC, steel, asbestos cement, concrete		
		and lead pipes. Their suitability and uses, types of joints in		

	5	different types of pipes.		
		5.2 Appurtenances: Sluice, air, reflux valves, relief valves,		
	1	scour valves, bib cocks, stop cocks, fire hydrants, water meters their working and uses		4) To perform jar test for coagulation
	2	5.3 Distribution site: Requirement of distribution, minimum head and rate,		
	3	methods of layout of distribution pipes		
	4	5.3.1 Systems of water supply - Intermittent and continuous service reservoirs - types, necessity and accessories.		
	5	5.3.2 Wastage of water - preventive measures		
8th	1	5.3.3 Maintenance of distribution system		
	2	5.3.4 Leakage detection		
	3	6. Laying out Pipes		
	4	6.1 Setting out alignment of pipes		
	5	6.2 Excavation for laying of pipes and precautions to be taken in laying pipes in black cotton soil.		
9th	1	6.3 Handling, lowering beginning and jointing of pipes		

	2	6.4 Testing of pipe lines		
	3	6.5 Back filling		
	4	6.6 Use of boring rods		
	5	7. Building Water Supply (02 hrs)		
10th	1	7.1 Connections to water main (practical aspect only)		5) To determine BOD of given sample
	2	**7.2 Water supply fixtures and installations and terminology related to plumbing		
	3	8. Introduction (04 hrs)		
	4	8.1 Purpose of sanitation		
	5	8.2 Necessity of systematic collection and disposal of waste		
11th	1	8.3 Definition of terms in sanitary engineering		6) To determine residual chlorine in water
	2	8.4 Collection and conveyance of sewage		
	3	8.5 Conservancy and water carriage systems, their advantages and		
	4	Disadvantages		
	5	8.6 (a) Surface drains (only sketches) : various types, suitability		
12th	1	(b) Types of sewage: Domestic, industrial, storm water and its seasonal variation		7) To determine conductivity of water and total dissolved solids
	2	9. Sewerage System (05hrs) 9.1 Types of sewerage systems, materials for sewers, their sizes and joints 9.2 Appurtenance: Location, function and construction features. Manholes,		

	3	drop manholes, tank hole, catch basin,		
	4	inverted siphon, flushing tanks grease		
	5	and oil traps, storm regulators, ventilating shafts 96		
13th	1	10. Laying and Construction of Sewers: (6 hrs)		
	2	10.1 Setting out/alignment of sewers		
	3	10.2 Excavations, checking the gradient with boning rods preparation of bedding		
	4	, handling and jointing testing and back filling of sewers/pipes.		
	5	10.3 Construction of surface mains and different sections required		
14thss	1	11 Sewage characteristics: (4hrs)		8) To study the installation of following: a) Water meter b) Connection of water supply of building with main c) Pipe valves and bends d) Water supply and sanitary fittings
	2	11.1 Properties of sewage and IS standards for analysis of sewage 11.2 Physical, chemical and bacteriological parameters		
	3	12. Natural Methods of Sewerage Disposal (5 hrs) 12.1 General composition of sewage and disposal methods		
	4	12.2 Disposal by dilution 12.3 Self purification of strea		
	5	m 12.4 Disposal by land treatment 12.5 Nuisance due to disposal		
15th	1	13. Sewage Treatment (9 hrs)		

		13.1 Meaning and principle of primary and secondary treatment and activated sludge process their flow diagrams		
	2	13.2 Introduction and uses of screens, grit chambers, detritus tanks, skimming tanks, plainsedimentation tanks, primary clarifers, secondary clarifers,		
	3	14. Building Drainage (9 hrs) 14.1 Aims of building drainage and its requirements		
	4	**14.2 Different sanitary fittings and installations		
	5	14.3 Traps, seals, causes of breaking seals		

(Signature of the teacher concerned with date)