

Name of the Faculty : Er. Ravinder Kumar

Discipline : Civil Engg.

Semester : 4th

Subject : CONCRETE TECHNOLOGY

Lesson plan duration : 15 weeks (from January, 2018 to April, 2018)

Work load (lecture/practical) per week (in hours): 03 lectures / 02 Practicals

Week	Theory		Practical	
	Lecture day	Topics (Including assignment/test)	Practical day	Topic
1 st	1 st	<ul style="list-style-type: none">• Introduction: Definition of concrete• uses of concrete in comparison to other building materials		
	2 nd	<ul style="list-style-type: none">• uses of concrete in comparison to other building materials		
	3 rd	<ul style="list-style-type: none">• Ingredients of Concrete		
2 nd	4 th	<ul style="list-style-type: none">• Cement: physical properties of cement; different types of cement as per IS Codes	1 st	<ul style="list-style-type: none">• To determine the physical properties of cement as per IS Codes
	5 th	<ul style="list-style-type: none">• Aggregates-• Classification of aggregates according to size and shape	2 nd	<ul style="list-style-type: none">• practice
	6 th	<ul style="list-style-type: none">• 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 rd	7 th	<ul style="list-style-type: none">• Assignment- Grading of aggregates: coarse aggregate, fine aggregate	3 rd	<ul style="list-style-type: none">• To determine flakiness and elongation index of coarse aggregates
	8 th	<ul style="list-style-type: none">• All-in- aggregate• fineness modulus• interpretation of grading charts	4 th	<ul style="list-style-type: none">• practice
	9 th	<ul style="list-style-type: none">• Water: Quality requirements as		

		per IS:456-2000		
4 th	10 th	<ul style="list-style-type: none"> • Water Cement Ratio: • Hydration of cement • principle of water-cement ratio 	5 th	<ul style="list-style-type: none"> • To determine silt in fine aggregate
	11 th	<ul style="list-style-type: none"> • Duff Abram's Water-cement ratio law: Limitations of water-cement ratio law and its effects on strength of concrete 	6 th	<ul style="list-style-type: none"> • practice
	12 th	<ul style="list-style-type: none"> • Limitations of water-cement ratio law • its effects on strength of concrete 		
5 th	13 th	<ul style="list-style-type: none"> • Workability 	7 th	<ul style="list-style-type: none"> • Determination of specific gravity and water absorption of aggregates
	14 th	<ul style="list-style-type: none"> • Workability factors affecting • Workability • Measurement of workability 	8 th	<ul style="list-style-type: none"> • Practice
	15 th	<ul style="list-style-type: none"> • slump test • compacting factor • Vee Bee consistometer 		
6 th	16 th	<ul style="list-style-type: none"> • Recommended slumps for placement in various conditions as per IS:456-2000/SP-23 	9 th	<ul style="list-style-type: none"> • Determination of bulk density and voids of aggregates
	17 th	<ul style="list-style-type: none"> • Properties of Concrete 	10 th	<ul style="list-style-type: none"> • practice
	18 th	<ul style="list-style-type: none"> • Properties in plastic state: Workability 		
7 th	19 th	<ul style="list-style-type: none"> • Segregation • Bleeding and Harshness 	11 th	<ul style="list-style-type: none"> • To determine surface moisture in fine aggregate by displacement method
	20 th	<ul style="list-style-type: none"> • Test 	12 th	<ul style="list-style-type: none"> • practice
	21 th	<ul style="list-style-type: none"> • Properties in hardened state: Strength, Durability • Impermeability, Dimensional changes 		
8 th	22 th	<ul style="list-style-type: none"> • Introduction to Admixtures (chemicals and minerals) for improving performance of concrete 	13 th	<ul style="list-style-type: none"> • Determination of particle size distribution of fine, coarse and all in aggregate by sieve analysis (grading of aggregate)
	23 th	<ul style="list-style-type: none"> • Special Concretes 	14 th	<ul style="list-style-type: none"> • practice

	24 th	<ul style="list-style-type: none"> • Cold weather concreting • Under water concreting • Hot weather concreting 		
9 th	25 th	<ul style="list-style-type: none"> • Ready mix concrete • Fibre reinforced concrete • Polymer Concrete 	15 th	•
	26 th	<ul style="list-style-type: none"> • Fly ash concrete • Silica fume concrete 	16 th	•
	27 th	• Concreting Operations:		
10 th	28 th	<ul style="list-style-type: none"> • 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 	17 th	• To determine necessary adjustment for bulking of fine aggregate
	29 th	<ul style="list-style-type: none"> • Storing of Aggregate • Storing of aggregate at site 	18 th	• practice
	30 th	• Batching (to be shown during site visit)		
11 th	31 th	<ul style="list-style-type: none"> • Batching of Cement • Batching of aggregate by: <ul style="list-style-type: none"> • Volume, using gauge box (farma) selection of proper gauge box • Weight spring balances and batching machines • Measurement of water 	19 th	• To determine workability by slump test
	32 th	<ul style="list-style-type: none"> • Mixing: <ul style="list-style-type: none"> • Hand mixing • Machine mixing - types of mixers, capacities of mixers, choosing appropriate size of mixers, operation of mixers • Maintenance and care of machines 	20 th	• practice
	33 th	<ul style="list-style-type: none"> • Machine mixing - types of mixers, capacities of mixers, choosing appropriate size of mixers, operation of mixers • Maintenance and care of machines 		
12 th	34 th	• Transportation of concrete	21 th	• To verify the effect of water, fine

				aggregate/coarse aggregate ratio and aggregate/Cement ratio on slump
	35 th	<ul style="list-style-type: none"> • Transportation of concrete using • wheel barrows • transit mixers 	22 th	<ul style="list-style-type: none"> • practice
	36 th	<ul style="list-style-type: none"> • chutes • belt conveyors • pumps • tower crane and hoists 		
13 th	37 th	<ul style="list-style-type: none"> • Placement of concrete 	23 th	<ul style="list-style-type: none"> • Compaction factor test for workability
	38 th	<ul style="list-style-type: none"> • Checking of form work, shuttering and precautions to be taken during placement 	24 th	<ul style="list-style-type: none"> • practice
	39 th	<ul style="list-style-type: none"> • test 		
14 th	40 th	<ul style="list-style-type: none"> • Compaction: • Hand compaction • Machine compaction - types of vibrators, internal screed vibrators and form vibrators • Selection of suitable vibrators for different situations 	25 th	<ul style="list-style-type: none"> • Non destructive test on concrete by: a) Rebound Hammer Test
	41 th	<ul style="list-style-type: none"> • Finishing concrete slabs - screeding, floating and trowelling 	26 th	<ul style="list-style-type: none"> • Non destructive test on concrete by: b) Ultrasonic Pulse Velocity Test
	42 th	<ul style="list-style-type: none"> • Curing: Objectives of curing, methods of curing like ponding, membrane curing, steam curing, chemical curing • Duration for curing and removal of form work 		<ul style="list-style-type: none"> •
15 th	43 th	<ul style="list-style-type: none"> • jointing: Location of construction joints • treatment of construction joints • expansion joints in buildings - their importance and location 	27 th	<ul style="list-style-type: none"> • practice
	44 th	<ul style="list-style-type: none"> • Importance and methods of non-destructive tests 	28 th	<ul style="list-style-type: none"> • Tests for compressive strength of concrete cubes for different grades of concrete
	45 th	<ul style="list-style-type: none"> • Test 		<ul style="list-style-type: none"> • practice

