## Lesson Plan (Even Semester)

#### Name of the Faculty : Rohit

#### Discipline : Civil Engg.

**Semester :** 4th

**Subject :** CONCRETE TECHNOLOGY

**Lesson Plan Duration :** 15 weeks

##### \*\*Work load (Lecture / Practical) per week(in hours): Lectures-03, practicals -02

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| **Week** | **Theory** | | **Practical** | |
| **Lecture day** | **Topic**  **(Including assignment / test)** | **Practical Day** | **Topic** |
| 1st | 1st | **Chapter 1. Introduction Definition of**  **concrete** uses of  concrete in comparison to other building material | 1st | To determine the physical properties of cement as per IS Codes |
| 2nd | **Chapter 2. Ingredients of Concrete** Cement: physical properties of cement; different types of cement as per IS Codes  Aggregates |
| 3rd | Classification of aggregates according to size and shape Characteristics of aggregates: Particle size and shape, surface texture, specific gravity of aggregate |
| 2nd | 4th | Bulk density, water absorption, surface moisture, bulking of sand deleterious materials soundness | 2nd | To determine flakiness and elongation index of coarse aggregates |
| 5th | Grading of aggregates: coarse aggregate, fine  aggregate; All-inaggregate; fineness modulus; interpretation of grading charts |
| 6th | Water: Quality requirements as per IS:456- 2000 |
| 3rd | 7th | **Chapter3.Water Cement Ratio** Hydration of cement, principle of water-cement ratio | 3rd | To determine silt in fine aggregate |
| 8th | Duff Abram’s Water-cement ratio law:  Limitations of water-cement ratio law |
| 9th | Limitations of water-cement ratio law and its effects on strength of concrete |
| 4th | 10th | **Chapter4.Workability** Workability factors affecting workability, Measurement of workability | 4th | Determination of specific gravity and  water absorption of aggregates |

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|  | 11th | slump test, compacting factor and Vee Bee consistometer; Recommended slumps for placement in various conditions as per IS:456-  2000/SP-23 |  |  |
| 12th | **Revision Assignment No.1**   1. Classification of aggregates according to size and shape 2. slump test, compacting factor and Vee Bee consistometer |
| 5th | 13th | **Sessional Test No.1** | 5th | Determination of bulk density and voids of aggregates |
| 14th | **Chapter5. Properties of Concrete**  Properties in plastic state |
| 15th | Workability, Segregation, Bleeding and Harshness |
| 6th | 16th | Properties in hardened state: Strength, Durability, Impermeability, Dimensional  changes | 6th | To determine surface moisture in fine aggregate by displacement method |
| 17th | **Chapter 6. Proportioning for Normal**  **Concrete** Objectives of mix design |
| 18th | introduction to various grades as per IS:456 2000; proportioning for nominal mix design as prescribed by IS 456-2000 |
| 7th | 19th | 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) |
| 20th | Difference between nominal and controlled concrete Introduction to IS-10262-2009-Code for controlled mix design |
| 21st | **Chapter7. Introduction to Admixtures**  Admixtures (chemicals and minerals) |
| 8th | 22nd | Admixtures (chemicals and minerals) for  improving performance of concrete | 8th | To determine necessary adjustment for bulking of fine aggregate |
| 23rd | **Revision Assignment No.2**   1. Segregation, Bleeding and Harshness 2. Bulking of fine aggregate, water absorption of aggregate |
| 24th | **Sessional Test No.2** |
| 9th | 25th | **Chapter8. Special Concretes (only**  **features)** Concreting under special conditions | 9th | To determine  workability by slump test |

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|  | 26th | difficulties and precautions before, during and after concreting,Cold weather concreting |  |  |
| 27th | Ready mix concrete,Fibre reinforced concrete,Polymer Concrete,Silica fume concrete,Fly ash concrete |
| 10th | 28th | **Chapter9.Concreting Operations** Storing of Cement,Storing of cement in a warehouse | 10th | To verify the effect of water, fine aggregate/coarse aggregate ratio and aggregate/Cement ratio on slump |
| 29th | Storing of cement at site,Storing of cement in a warehouse,Effect of storage on strength of  cement |
| 30th | Storing of Aggregate: Storing of aggregate at site,Batching (to be shown during site visit ) |
| 11th | 31st | Batching of Cement,Batching of aggregate  by:Volume, using gauge box (farma) selection of proper gauge box | 11th | Compaction factor test for workability |
| 32nd | Weight spring balances and batching  machines |
| 33rd | Measurement of water,Mixing,Hand mixing |
| 12th | 34th | Machine mixing - types of mixers, capacities of mixers, choosing appropriate size of mixers, operation of mixers | 12th | Non destructive test on concrete by rebound hammer |
| 35th | Maintenance and care of machines,Transportation of concrete: Transportation of concrete using: wheel barrows, transit mixers, chutes, belt conveyors, pumps, tower crane and hoists etc |
| 36th | Placement of concrete,Checking of form work, shuttering and precautions to be taken during placement |
| 13th | 37th | Compaction,Hand compaction,Machine compaction - types of vibrators, internal  screed vibrators,and form vibrators | 13th | Non destructive test on concrete by ultrasonic pulse velocity test |
| 38th | Selection of suitable vibrators for different  situations |
| 39th | Finishing concrete slabs - screeding, floating  and trowelling,Curing |

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| 14th | 40th | Objectives of curing, methods of curing like ponding, membrane curing, steam curing, chemical curing,Duration for curing and removal of form work | 14th | Tests for compressive strength of concrete cubes for different grades of concret |
| 41st | Objectives of curing, methods of curing like  ponding, membrane curing, steam curing, chemical curing,Duration for curing and  removal of form work |
| 42nd | Jointing: Location of construction joints, treatment of construction joints, expansion joints in buildings - their importance and  location |
| 15th | 43rd | **Chapter10;Importance and methods of non-destructive tests**  (introduction only) non-destructive tests | 15th | **Revision** |
| 44th | **Revision Assignment No.3**  **1** Cold weather concreting,Compaction: **2** Fibre reinforced concrete, Fly ash concrete,Mixing: |
| 45th | **Sessional Test No.3** |
| **Any additional available hours shall be used for revision** | | | | |