Syllabus for Diploma Engineering

Civil Engineering

Semester – IV

Subject Name: Concrete Technology

Subject Code: 09CI1404

Diploma Branches in which this subject is offered: Civil Engineering

Objective: Purpose of introducing this subject is:

1. To understand the basic behavior of concrete,
2. The application in a varied environment,
3. To handle the material on site and thus become good professional engineers

Credits Earned: 3

Course Outcomes: The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes as follow**:**

1. They should able to understand and evaluate the physical properties of cement, sand, and aggregates.
2. They should able to perform mix Design of concrete
3. Application of various special concrete
4. They should able to understand and perform methods to prevent and repair different types of the crack.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE	IA	CSE	Viva	Term work	
0	0	6	3	00	30	20	25	25	100

Contents:

Unit	Topics	Teaching Hrs	Weightage (%)
1	**Introduction to Materials of concrete** • Definition of concrete. • A brief introduction to the properties of concrete. • Advantages & Uses of concrete in comparison to other building materials. • The chemical ingredients causing changes in properties. • Type of cement Situations of use and special precautions in the use of different types of cement. • Classification of aggregates according to the source, size, and shape • Characteristics & Grading of aggregates. • Qualities of Water.	**22**	**24**
2	**Fresh Concrete** • Workability, Segregation and Bleeding. • Factors affecting workability • Workability Tests: slump, compaction factor, Vee-bee consistency test, flow table. • Mixing & Transportation of Concrete. • Hydration of Cement. • Setting time of concrete.	**20**	**24**
3	**Mixing, Placing and Curing of Concrete** • Batching & Mixing • Transporting & Placing • Compacting • Curing • Finishing	**10**	**12**
4	**Concrete Mix Design** • Factor affecting the quality of concrete & advantage of quality control. • Nominal Mix and design. • A different method of mix design. • Concrete mix design as per IS 10262: 2009	**16**	**20**
5	**Hardened Concrete** • Concept and properties of hardened concrete. • Factor affecting the strength of hardened concrete. • Elasticity, Creep & Shrinkage: effects and factor	**8**	**10**

	affecting.		
6	**Durability and Special Type of concrete** • Durability and factor affecting durability. • Construction Chemicals & Various types of Admixtures. • Uses of admixture to form a special type of concrete.	**8**	**10**
	Total	**84**	

Suggested List of Experiments:

Sr. No.	**Unit No.**	**Name of Topics**	**Hours**
1	1	Criteria to store cement and field testing of cement.	2
2		Soundness of Cement.	2
3		Initial, Final Setting time and standard consistency Test	4
4		Compressive Strength of Cement	2
5		Property of Coarse aggregate & Fine aggregate	2
6		Determination of Elongation Index and Flakiness Index	2
7		Sieve Analysis of Coarse aggregate & Fine aggregate	2
8		Specific gravity test (F.A & C.A)	2
9		Aggregate Impact test	2
10		Aggregate Crushing test	2
11	2	Demonstration of different workability test equipment	4
12		Slump cone test .	4
13		Compaction factor test.	4
14		Demonstration of Mixing.	4
15		Demonstration of Transportation of Concrete.	4
16	3	Demonstration on mixing, batching, curing and compaction	10
17	4	Preparing Concrete mix design for Different grades	10
18		Casting of Cube, Cylinder & Beam for all the different type of concrete	6
19	5	Compressive strength test of concrete	2
20		Split tensile strength test of concrete	4
21		Flexural strength test of concrete	2
22	6	Rebound Hammer test	4
23		Ultrasonic pulse velocity test	4
Total			**84**

Instructional Method:

a. The course delivery method will depend upon the requirement of content and the need of students. The teacher in addition to the conventional teaching method by blackboard may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory.

c. Practical examination will be conducted at the end of the semester for an evaluation of the performance of students in the laboratory.

d. Students will use supplementary resources such as online videos, videos, & e-courses

Reference Books:

1. Concrete Technology by M.S Shetty; S Chand co Ltd
2. Concrete Technology by M.L Gambhir; Tata McGraw Hill Ltd