Kadi Sarva Vishwavidyalaya, Gandhinagar

M.E. (Civil Infrastructure Engineering) Semester: II

(w.e.f. Academic Year 2017-18)

Subject Name: Advanced Concrete Technology

Subject code: MECV202-N

A. Learning objectives:

The Learning Objectives are :

- To understand the behavior of different Special Concretes, and Various Concreting Techniques.
- To aware Students about "Advances in Concrete Technology and Sustainable Construction Practices".

B. Teaching Scheme: (Credits and Hours)

Teaching Scheme				Credit Scheme			Evaluation Scheme				
Lect (Hrs)	Tu (Hrs)	Prac. (Hrs)	Total (Hrs)	Theory	Pra/TW	Total	UE	IE	CIA	Prac/Viva	Total
03	02	00	05	03	01	04	70	30	20	30	150

C. Detailed Syllabus:

Unit No. **Topics**

1. **Introduction:**
   Sustainable Development concept, Introduction of Recent advances in Concrete Technology, Sustainable Construction Practices: world scenario
2. **Supplementing Cement Materials (SCMs):**
   Review of types covering pulverized fuel ash, ground granulated blast furnaces slag and silica fume, Rice husk Ash, manufacture, physical characteristics, effects on properties of concretes. Admixtures: - Plasticizers, Super plasticizers, retarder, accelerators, Curing compounds and their effects on properties of concrete. Epoxy resins and screeds for rehabilitation – Properties and Applications
3. **Special Concretes:**
   High performance concrete, High Strength concrete, fiber reinforced concrete, Light weight concrete, High density and radiation shielding concrete, High volume fly ash concrete and Self compacting concrete
4. **Special Processes & technology for particular types of structures:**
   Mass concrete, Sprayed concrete, Ferro-cement concrete, pumped concrete, Roller compacted concrete, Sustainability of concrete industry
5. **Repair & rehabilitation Techniques:**
   Visual inspection of concrete structure distress in concrete, Non- destructive test, crack repair techniques, damage assessment procedure, deterioration-causes & prevention, strengthening techniques.

D. Lesson Planning:

Unit No.	Topics	Hours	Weightage (%)
1.	Introduction	05	10
2.	Supplementing Cement Materials	12	25
3.	Special Concretes	08	20
4.	Special Processes & technology for particular types of structures	08	20
5.	Repair & rehabilitation Techniques	12	25
	Total	**45**	**100**

E. List of Tutorials:

- Tutorial based on Basics of Advanced Concrete Technology.
- Tutorial based on Supplementing Cement Materials.
- Tutorial based on Special Concretes.
- Tutorial based on Special Processes & technology for particular types of structures.
- Tutorial based on Repair & rehabilitation Techniques.
- Concrete Mix Design.

F. Instructional Method and Pedagogy **(Continuous Internal Assessment (CIA) Scheme)**

- Attendance is compulsory in lectures which carries 05 Marks.
- At regular intervals assignments is given to all students which carries 10 marks. Evaluation of these assignments will be observed under Daily Homework Daily Assessment (DHDA) System.
- One internal exam of 30 marks is conducted as a part of internal theory evaluation.

G. Students Learning Outcomes:

- Non-destructive testing of concrete : Rebound hammer test.
- Able to understand the Mix design calculations of Concrete.
- Able to understand the procedure of Mix design of Concrete.
- Effects of additives and admixtures in concrete.

H. Text Books & Reference Books:

1. Properties of Concrete - Neville A. M.
2. Concrete Technology- Shetty M. S.
3. Concrete Technology- Gambhir M. L.
4. Concrete Technology by A.R. Santhakumar, IIT Madras