GUJARAT TECHNOLOGICAL UNIVERSITY

CIVIL (STRUCTURAL ENGINEERING) (20)

ADVANCES IN CONCRETE TECHNOLOGY AND SUSTAINABLE CONSTRUCTION PRACTICES

SUBJECT CODE: 2722015

SEMESTER: II

Type of course: Open Elective

Prerequisite: --

Rationale: --

Teaching and Examination Scheme:

Teaching Scheme			Credits	Examination Marks						Total Marks
L	T	P	C	Theory Marks		Practical Marks				
				ESE (E)	PA (M)	ESE (V)		PA (I)		
						ESE	OEP	PA	RP	
3	2#	2	5	70	30	20	10	10	10	150

Content:

Sr. No.	Content	Total Hrs	% Weightage
1	Sustainable Development concept, Introduction of Recent advances in Concrete Technology, Sustainable Construction Practices: world scenario	03	10
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: - Plasticizesrs, Super plasticizers, retarder, accelerators, Curing compounds and their effects on properties of concrete. Epoxy resins and screeds for rehabilitation – Properties and Applications	08	20
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	08	20
4	Sustainable Construction Practice: Green Concrete, Geo Polymer Concrete, Reactor Powder Concrete, Recycled concrete, Slag Cement and Health assessment of Concrete	08	20
5	Special Processes & technology for particular types of structures: Mass concrete, Sprayed concrete, Ferro-cement concrete, pumped concrete, Roller compacted concrete, Sustainability of concrete industry.	06	15

6	Repair & rehabilitation Techniques: Visual inspection of concrete structur distress in concrete, Non- destructive test, crack repair techniques, damag assessment procedure, deterioration-causes & prevention, strengthenin techniques.	06	15

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

Course Outcome:

After learning the course the students should be able to understand supplementing Cement Materials, Special Concretes, Sustainable Construction Practice, Special Processes & technology for particular types of structures.

List of Tutorials:

(a) Non-destructive testing of concrete- Rebound hammer, Ultra sonic pulse velocity test
(b) Mix design for high performance concrete: Experimental
(c) Effects of additives and admixtures in concrete: Effects on workability and strength of concrete.

Major Equipments: Concrete rebound hammer, Ultra sonic pulse velocity tester

List of Open Source Software/learning website:

http://nptel.ac.in/

Review Presentation (RP): The concerned faculty member shall provide the list of peer reviewed Journals and Tier-I and Tier-II Conferences relating to the subject (or relating to the area of thesis for seminar) to the students in the beginning of the semester. The same list will be uploaded on GTU website during the first two weeks of the start of the semester. Every student or a group of students shall critically study 2 papers, integrate the details and make presentation in the last two weeks of the semester. The GTU marks entry portal will allow entry of marks only after uploading of the best 3 presentations. A unique id number will be generated only after uploading the presentations. Thereafter the entry of marks will be allowed. The best 3 presentations of each college will be uploaded on GTU website