RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

Credit Based Grading System

Civil Engineering, IV-Semester

CE-4002 Concrete technology

COURSE OBJECTIVE

The course relates to the fundamentals related to concrete and concrete material, besides dealing with masonry, reinforcement, etc. The course begins with an outline of what concrete is, what are the processes involved in formation of concrete, various materials that are used in concrete formation, properties of each ingredient of concrete, standard tests to be applied to concrete and concrete ingredients. The course then moves on to design-mix, special concretes, Nondestructive testing, etc.

COURSE CONTENT

Introduction Classification :properties, grades, advantage & disadvantages of concrete, Ingredients of concrete, types of cement, aggregates, water, admixtures, Inspection & testing of materials as per Indian Standard Specifications.

Properties of Fresh and Hardened Concrete : Introduction, Workability, Testing of concrete, Factors affecting, Rheology of concrete, Compressive & Tensile strength, Stress and strain characteristics, Shrinkage and temperature effects. Creep of concrete, Permeability, durability, thermal properties & micro-cracking of concrete.

Design of Concrete Mix : Various classical methods of concrete mix design, I.S. code method, basic considerations and factors influencing the choice of mix design, acceptance criteria for concrete, concrete mixes with Surkhi and other Pozzolanic materials, design of plastic concrete mix, computer aided design of concrete mix.

Production and Quality Control of Concrete : Production of crushed stone aggregate, batching equipments for production and concreting, curing at different temperatures, Concreting underwater, hot & cold weather condition, statistical quality control, field control, non-destructive testing, repair technology for concrete structures, Inspection & Testing of Concrete.

Special Concretes : Light weight concrete, Ready mix concrete, Vacuum concrete, Ferrocement, Fiber reinforced concrete, Polymer concrete composites, Shotcrete, Guniting, Rubble concrete, Resin concrete, Prestressed concrete, Heat resistant concrete, Mass concrete, Temperature control of mass concrete.

COURSE OUTCOME:-

The knowledge of what concrete is, how it is formed, what materials are involved and properties and requirements of each concrete ingredient.

Ability to perform various tests on concrete ingredients and also on concrete (Fresh and Hardened).

Ability to analyze various special concrete and their applications. Basic knowledge of Nondestructive testing.

REFERENCES

1.M S Shetty, Concrete Technology. S. Chand Technical

2.M L Gambhir,Concrete Technology Theory and Practice, McGraw-Hill Education.

3.J Thomas, Concrete Technology, Cengage Learning.

4.AM Neville, Concrete Technology, Pearson Education India.

5.Santhakumar ,Concrete Technology., Oxford University Press

6.SS Bhavikatti, Concrete Technology, IK International

7.Sinha, S N Reinforced Concrete Design, Tata McGraw Hill Education Private Limited.

8.Rai Mohan, M.P. Jai Singh, Advances in Building Materials & Construction.

9.Jackson N, R K Dhir, Civil Engineering materials, Macmillan

LIST OF EXPERIMENT

1.To determine the normal consistency of cement.
2.To determine the initial and final setting time of cement .
3.To determine compressive strength of cement.
4.To determine the soundness of cement.
5.To determine the fineness modulus of fine aggregate & course aggregate.
6.Mix design of concrete by IS code Method.
7.slump test for determining workability of concrete.
8.compressing strength of concrete cube.
9.To determine the flexure strength of concrete.

IS CODES:

1. *New Building Materials* B.M.T.P.C., New Delhi
2. *Hand books on Materials & Technology*. BMTPC & HUDCO