02.08.2016

FIRST SEMESTER 2016-2017

Course Handout Part II

In addition to part -I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

Course No. : **CE F214**

Course Title : **Construction Materials**

Instructor-in-charge : **Dr. Bahurudeen A**

1. Scope and Objective of the Course:

The course deals with properties, characterization, testing, selection and quality control of construction material. For economical, durable and high performance of structure, it is imperative to have knowledge on construction materials and their wider applications. This course provides the basic and enhanced overview on various construction materials presently used in practice. Relevant Indian Standard codes of practice will be given emphasis.

2. Text Books:

T1. Duggal, S.K. (2012) "Building Materials" New Age International Pvt. Ltd., New Delhi, 4th edition.

T2. Ghambir, (2013) Concrete Technology, Tata McGraw-Hill Publishing Company Ltd, 5th edition.

Reference Books:

R1. Mehta, P.K. and P.J.M. Monteiro. Concrete Microstructure, Properties, and Materials, The McGraw-Hill Companies, United States, 2006.

R2. Newman, J. and B.S. Choo. Advanced Concrete Technology-Part 1-4. Constituent Materials. Butterworth-Heinemann. An imprint of Elsevier, United Kingdom, 2003.

R3. Materials science and engineering: An introduction/ William D. Callister, 2007. John Wiley & Sons.

R4. Relevant IS, ASTM standards

3. Course Plan:

No. of Lectures	Learning Objectives	Topics to be covered	References
1	Construction Materials- An overview	Introduction. General discussion on few prominent construction materials.	1, T1
5	Cement manufacturing process, composition and chemistry, types of cement, effect on properties, test on cement	Different types of cements, chemical composition, and hydration of cement, properties and applications.	2, T1 and 5, T2
1	Cement testing	Various lab and field tests on cement.	5.9, T2
3	Aggregate classification and tests	Properties. coarse and fine aggregate for concrete, tests on aggregates, grading of aggregates and its effect on concrete properties	3, T1 and 6, T2
6	Chemical and Mineral admixtures	Different chemical admixtures, Functions, compounds, advantages and disadvantages fly ash, calcined clay, ground blast furnace slag, rice husk ash, and silica fume.	5, T1
2	Concrete as a construction material	Fresh and Hardened properties of concrete.	6, 7, 8, T1
2	Durability and Quality control of concrete	Durability of concrete, Quality Control of concrete,	8, 9,13, T1
2	Special Concretes	Light weight aggregate concrete, Cellular concrete, No-fines concrete, High density concrete, FRC, HPC, SCC etc.,	14, 16, T1
2	Stones: Properties, tests, selection	Classifications, applications, characteristics of building stone, tests.	3, T2
2	Clay products: Properties, tests, selection	Manufacturing of bricks, blocks, ingredients, IS classifications, applications, various tests.	2, T2

2	Lime: Properties, tests, application	Various types of limes, IS classification, various tests, applications.	8, T2
2	Wood and timber	classifications, various tests, seasoning, defects and preservation	4, T2
1	Paints and varnishes	Composition, preparation, defects, applications.	18, T2
4	Tar, bitumen, modified bitumen	Properties and Test methods	19, T2,
2	Steel, ferrous and non-ferrous metals	Different type of ferrous and non-ferrous metals, properties, stress-strain behavior, test, applications,	14, 15, T2
3	Polymeric material, geo-synthetics and Misc. materials	Classifications, rubber, plastics, geosynthetics functions, classification, application and testing	16, 21, 10, 20, T2,
Total: 40			

4**. Reading Assignments:** Will be given as & when necessary.

5. **Evaluation Scheme:**

Component	Duration	Weightage (%)	Date & Time	Remarks
Mid Semester Test	90 min	25	<TEST_1>	Closed Book
Surprise Quiz	-	10	-	Closed Book
Tutorials **Take Home Assignments**		10 (CB) 20 (OB)	Continuous	Closed Book & Open Book
Comprehensive Exam	180 min	35	<TEST_C>	Closed book

6. Mid-semester grading: Mid Test + Tutorials + Surprise Quiz + Assignment

7. Chamber Consultation Hour: **Wednesday *6:00 pm-6:50 pm***

8. Reading Assignments will be given as and when necessary

9. Notice: Notice concerning this course will be displayed on the Notice Board of Civil Engineering Department.

Instructor-in-charge CE F214