LESSON PLAN

B.Tech. Civil Engineering – II Semester February-2016

Course Code	**15CE102**
Corse Title	**Elements of Building Material Science**
Prerequisites	**Nil**
Category	**Professional Subjects (P)**

Instructional Objectives

Instructional objectives no.	Instructional objectives (IO)
1	To learn the manufacturing process, types, applications and testing procedures for materials used for load bearing purpose
2	To know about materials that is used for protection and functional purpose.
3	To impart knowledge about basis of recent paradigms, and new materials

Student outcomes

Student outcome number	Student outcomes (SO)
a	an ability to apply knowledge of mathematics, science, and engineering
e	an ability to identify, formulate, and solve engineering problems
k	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Lecture No.	Topics to be covered	Instructional objectives	Student outcome	Reference
UNIT I – BASIC LOAD BEARING MATERIALS				
1.	Introduction, Stones - classification of rocks, quarrying, dressing, properties of stones	1	a,e	1,2,4
2.	Uses of stones, Tests for stones, Properties of stones	1	a,e	1,2,4
3.	Bricks – composition, manufacturing, and classification	1	a,e	1,2,4
4.	Qualities of bricks, uses, and tests for bricks	1	a,e	1,2,4

Lecture No.	Topics to be covered	Instructional objectives	Student outcome	Reference
5.	Timber – classification of trees, Structure of tree, market forms, uses of timber	1	a,e	1,2,4
6.	Wood products – veneers, plywood, fiber boards, block boards, laminas, battens and hard boards	1	a,e	1,2,4
UNIT II – ADVANCED LOAD BEARING MATERIALS				
7.	Cement – Introduction, ingredients, manufacture, dry and wet process	1	a,e	1,2,4
8.	Types of cement, properties, uses, tests for cement.	1	a,e	1,2,4
9.	Mortar – functions, requirements, types, properties, uses, tests on mortar.	1	a,e	1,2,4
10.	Steel – introduction, types, properties, uses, market forms.	1	a,e	1,2,4
11.	Concrete – Ingredients, functions, w/c ratio, grades, admixtures, test on concrete, properties, uses.	1	a,e	1,2,4
12.	RCC – Characteristics, elements, advantages, disadvantages.	1	a,e	1,2,4
UNIT III – SPECIAL CONSTRUCTION MATERIALS				
13.	Prestressed concrete – types, properties, uses, merits and demerits.	3	a,e,k	1,2,4
14.	Ferro cement – advantages, uses.	3	a,e,k	1,2,4
15.	Fiber reinforced concrete – types of fibers, steel fibers, SFRC, properties, applications.	3	a,e,k	1,2,4
16.	Lightweight concrete – types, High density concrete.	3	a,e,k	1,2,4
17.	High strength concrete – advantages, applications	3	a,e,k	1,2,4
18.	High performance concrete – properties.	3	a,e,k	1,2,4
UNIT IV – NON LOAD BEARING MATERIALS				
19.	Paints - Functions, constituents, characteristics, selection, types of paints, defects.	2	a,e,k	1,2,4
20.	Varnishes - Elements, properties, types.	2	a,e,k	1,2,4
21.	Distempers - composition, properties.	2	a,e,k	1,2,4
22.	Asbestos – Properties, uses, asbestos cements products.	2	a,e,k	1,2,4
23.	Glass – Constituents, composition, classification, properties, market form, uses.	2	a,e,k	1,2,4

Lecture No.	Topics to be covered	Instructional objectives	Student outcome	Reference
24.	Plastic – constituents, classification, properties, uses.	2	a,e,k	1,2,4
UNIT V – RECENT CONSTRUCTION MATERIALS				
25.	Reactive powder concrete – properties, Geopolymer concrete – advantages	3	a,e,k	1,2,4
26.	Blended cement concrete – use of mineral admixtures, properties	3	a,e,k	1,2,4
27.	Self-health monitoring concrete, Bacterial concrete	3	a,e,k	1,2,4
28.	Roller compacted concrete - uses	3	a,e,k	1,2,4
29.	Self-compacting concrete, properties, advantages	3	a,e,k	1,2,4
30.	Ready mixed concrete – advantages.	3	a,e,k	1,2,4

TEXT BOOKS

1. Raju, K.V.B, Annadurai .R and PRavichandran.P.T, “Construction Materials”, Ayyappaa Publications, Chennai, 2012.
2. Varghese .P.C, “Building Materials”, Prentice Hall India,2005.

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3. Rangwala .S.C, “Engineering Materials”, Charotor Publishing House, New Delhi, 2012.
4. Surendra Singh, “Building Materials”, Vikas Publishing Company, New Delhi, 1996.
5. Arora and Bindra .S.P, Building Construction, “Planning Techniques and Method of Construction", Dhanpat Rai Sons, New Delhi, 1988.
6. Gurucharan Singh, “Building Construction and Materials”, Standard Book House, Delhi, 1988.
7. Shetty .M.S, “Concrete Technology”, S.Chand and Company, New Delhi, 2010.
8. “Lecture Notes on Special Concretes, Special Concrete,” Department of Civil Engineering, SRM Engineering College, Kattankulathur 2007.

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HOD/Civil Engineering