

AR 113 BUILDING MATERIALS – I :: C-16

Subject Title	:Building Materials – I
Subject Code	:AR-113
Periods / Week	:3
Periods / Semester	:54
Credits	:3
Internal Assignments & Mids	:50 Marks
External Examinations	:50 Marks
Total Marks	:100 Marks
Duration of Exam	:3 Hrs (University Exam)

TIME SCHEDULE

Sl. No	Major Topics	No. of periods	Weightage of Marks	Short Ans Questions	Essay Ans Questions
			End Exam	End Exam	End Exam
1.	Unit – I (Brick)	6	10	1	1
2.	Unit – II (Stone)	9	18	1	2
3.	Unit – III (Sand)	6	8		1
4.	Unit – IV (Cement)	6	8		1
5.	Unit – V (a) Mortars (b) Concrete	9	10	1	1
6.	Unit – VI (Timber)	9	10	1	1
7.	Unit – VII (c) Ferrous Metals (d) Non Ferrous Metals	9	10	1	1
	Total:	54	74	5	8

- Note:**
1. Duration of examination is for 3 hours Theory Examination
 2. Part A: 5 questions – each question carries 2 marks, all 5 to answer and no choice
 3. Part B: 5 questions have to be answered out of 8 questions each question carries 10 marks (3 are choice)

Course Overview:

The course provides information on the properties, use, installation and costs of basic building materials.

Objectives of the Course:

- To impart knowledge on the various building materials,
- To highlight the current trends and innovations in the usage of building materials.

Expected Skills / Knowledge Transferred:

Knowledge required for specifying appropriate materials for various spaces in buildings.

Course Contents:

Unit –I

Brick: Composition of brick earth, standards as per ISI, brick manufacturing processes, requirements and tests for good bricks. Fire clay bricks - varieties; sand lime bricks; paving bricks; Terra-cotta-its varieties., Special types of bricks, uses and properties. Different uses of brick in construction and their properties.

Unit –II

Stones: Classification of rocks: method of quarrying of building stones, dressings defects in stone, tools used. ISI standards.

Preservation of stone work. stone units - khandki, rubble, black stones, stone metal, flag stones. types of stone, stones used in construction, classification of stones :granite, laterite, quartzite, marble and slates -properties and uses; uses in construction, aggregates.,

Unit –III

Sand : Sources of sand, bulk age of sand, impurities in sand their removal, tests for silt and organic contents different grades of sand with respect to size and their application. I.S.I. standards.

Unit –IV

Cement: Manufacturing process, Types of cement, Grades of cements, Tests on cement, ISI Standards, Application and its properties.

Unit –V

(a) **Mortars:** Types, mixing and grinding, mortar, cement mortar, lime mortar, methods of preparing, handling and uses of mortars, Surkhi-mortar, light weight mortars i.e. cinder, sawdust and fibrous plaster, gypsum plaster, Plaster of Paris and application.

(b) **Concrete:** aggregates, water cement ratio, admixtures, properties of concrete, strength, durability, aging of concrete, mixing and curing, advanced concretes.

Unit –VI

Timber: Sources of timber, types and its properties, methods of sawing, shrinkage and distortion, wastage, Drying and seasoning, moisture contents, purpose of seasoning, natural and artificial. Defects in timber. Use and application of timber in construction.

Unit –VII

(c) **Ferrous Metals -** Pig iron, cast iron, wrought iron, steel, manufacturing processes and casting. Characteristics form and uses of cast iron, wrought iron and steel.

Alloys steel, stainless steel, steel-treatment, steel tempering, annealing, normalizing, and case hardening, their objectives and effect on alloy steels. Galvanizing, oxidation and casting of metallic products, corrosion of iron and their prevention. Metallic protective coatings.

(d) Non ferrous Metals: Basic idea of important ores, properties and uses of Aluminum, Zinc, Copper, Tin and Lead

Reference Books:

- **Hailey & Hancork, D.W.** Brick Work & Associated Studies Vol. 2. MacMillan, London, 1979.
- **Moxley, R.** Mitchell's Elementary Building Construction, Technical Press Ltd.
- **Rangwala, S.C.** Building Construction, 22nd ed. Charotar Pub. House, Anand, 2004.
- **Sushil Kumar.** T.B. of Building Construction, 19th ed. Standard Pub, Delhi, 2003.

Note: Students should be exposed to on site and Laboratory tests of above materials. Students should conduct market survey of above