



C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology and Engineering (Diploma Engineering)

DEPARTMENT OF: -Civil Engineering

SEMESTER: - III **CODE:** -2TE03BMT1

NAME – Building Material

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)		Total	
											Internal			University
							Sessional Exam		University Exam		Pr	TW		Pr
							Marks	Hours	Marks	Hours				
2TE03BMT1	Building Material	03	00	00	03	03	30	1.5	70	03	----	-----	---	100

Objectives: To equip the students with comprehensive knowledge of building material with emphasis on their applications.

Prerequisites:- Basic knowledge of variety of materials.

Course Outlines:-

Sr. No.	Course Contents	Teaching Hours
1	Building Stones Classification of Rocks: (Brief review only), Geological classification: Igneous, sedimentary and metamorphic rocks. Chemical classification: Calcareous, argillaceous and siliceous rocks. Physical classification: Unstratified, stratified and foliated rocks. General characteristics of stones. Requirements of good building stones and their testing. Identifications of common building stones. Various uses of stones in construction.	05
2	Bricks and Tiles Introduction to bricks. Raw materials for manufacturing and properties of good brick making earth. Manufacturing of bricks (i) Preparation of clay (manual/mechanically). (ii) Moulding: hand moulding and machine moulding, drying of bricks, burning of bricks, types of Kilns (Bull's Trench Kiln; traditional brick, refractory brick, clay flyash bricks, sundried bricks. Classification of bricks as per BIS:1077, Size of brick IS specifications, commercial Sizes. Testing of common building bricks as per BIS: 3495 Compressive strength, water absorption, efflorescence, dimensional tolerance test. Special bricks. (i) Building tiles: Types of tiles wall, ceiling, roofing and flooring tiles (ii) Ceramic tiles, their properties and uses. Stacking of bricks and tiles at site.	06
3	Cement Introduction, raw materials, manufacture of ordinary Portland cement, flow diagram for wet and dry process. Properties and uses of ordinary portland cement. Testing of	08

	cement as per BIS: Strength of cement, fineness by sieving, consistency, soundness, setting times. Special Cements and their uses. Storage of Cement.	
4	Lime Introduction: Lime as one of the following materials. Natural sources for the manufacture of lime. Definition of terms: quick lime, fat lime, hydraulic lime, hydrated lime, lump lime. Calcination and slaking of lime. IS classification of lime. Testing of lime.	06
5	Timber and Wood Based Products Classification of trees: Exogenous and Endogenous trees, crosssection of an exogenous tree and explanation of various terms. Identification of various types of timber: Teak, Deodar, Shisham, Sal, Mango, Kail and Chir. Market forms of converted timber as per BIS. Seasoning of timber: Purpose, methods of seasoning, Kiln seasoning as per BIS. Defects in timber, decay in timber. Preservation of timber and methods of treatment as per BIS. Properties of timber and specifications of structural timber. Common structural timbers in India, their availability and uses Teak, Deodar, Shisham, Sal, Mango, Kail and Chir. Plywood; Veneers and veneering, manufacturing plywood (brief description only), uses of plywood. Other wood based products, their brief description of manufacture and uses; laminated board, block board, fibre board, hard board and gypsum board, applications of boards in false ceiling and wall paneling.	06
6	Paints and Varnishes Purpose and uses of paints. Different types of paints: oil paints, water paints, cement paints and plastic paints. (i) Oil paints: Constituents of an oil paint, raw materials used for different constituents of oil paints and their properties, preparation of an oil paint, characteristics of a good oil paint. Application on wood and metal surfaces. (ii) Cement paints commonly available cement paints, their properties and uses. Application of cement paints (iii) Water paint, Plastic paints and their uses. (iv) Varnishes and polishes types, properties and their uses. (v) Lacquers and enamels their properties and their uses.	06
7	Metals Ferrous Metals: Composition, properties and uses of cast iron, steel (mild and high tension steel), requirements of mild steel as per BIS. Non Ferrous Metals: properties and uses of the following non ferrous metals in Civil Engineering works copper, lead, zinc, tin and aluminium. Commercial forms of ferrous and non ferrous metals.	04
8	Miscellaneous Materials Plastics: Important commercial products of plastics used in Civil Engineering Construction. Asbestos based products: Commercial forms and their uses. Insulating materials for Sound and Thermal Insulation Geotextiles. Construction chemicals like: water proofing compounds epoxies, sulphides, polymers. Glass: Types of glasses, their properties. Commercial forms and uses: plate glass, wired glass, bullet resisting glass, coloured glass, fibre glass, foamed glass wool, float glass, glass reinforced plastic. Water proofing materials; Bitumen sheets and felts, chemical admixtures Composite materials.	06

Learning Outcomes:

- Knowledge of all building materials and their application.
- Ability to choose the most suitable material for a work.

Books Recommended:-

- Civil Engineering Materials by **Technical Teachers Training Institute**, Chandigarh Tata McGraw-Hill Publishing Company Ltd. New Delhi Edition 1st 1992
- Building Materials **S.K. Duggal**
- Building Materials **P.C. Varghese PHI**
- Engineering Materials S.C. Rangwala