

BUILDING MATERIALS – PLANNING AND CONSTRUCTION

IV Semester: CE

Course Code	Category	Hours/Week			Credits	Maximum Marks		
ACEC09	Core	L	T	P	C	CIA	SEE	Total
		3	0	0	3	30	70	100
Contact Classes:45	Tutorial Classes: Nil	Practical Classes: Nil			TotalClasses:45			

Prerequisite: No prerequisites required

I. COURSEOVERVIEW

The construction materials course introduces students to materials used in different construction projects from building materials to ground and foundation make-up. Specific materials studied include soil, metals, concrete and wood. This course also covers finishes and materials for the exterior and interior of buildings. Skills are developed to assess the effect materials have on a building projects related to structure, fire safety, building codes as well as market demand. A large part of construction management has to do with overseeing entire building projects or multiple construction projects. This course helps to develop students' skills in managing projects and people. This course may be taken at different times in a construction management program with an emphasis on residential or commercial construction.

II. COURSEOBJECTIVES

The Students will try to learn:

1. The basics of material science and behavior of various building materials used in construction.
2. The construction materials required for the assigned work.
3. The procedural knowledge of the simple testing methods of cement, lime and concrete etc.
4. The requirements and different types of stairs.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	Recognize appropriate building materials used for obtaining better performance of structures in the civil engineering applications.	Remember
CO 2	Identify the mineral and chemical admixtures for enhancing the strength and durability of concrete mixtures.	Understand
CO 3	Distinguish the difference among Galvanized iron, Fiber -reinforcement plastics, steel, wood and aluminum for the construction of doors and windows.	Understand
CO 4	Select suitable type of truss, RCC roof, and madras terrace as per structural need for sustaining applied loads successfully.	Understand
CO 5	Choose various types of stair cases used in modern construction scenario for improving the accessibility of building floors.	Understand
CO 6	Outline building by-laws and standards of building Components for better planning and construction.	Understand

IV. SYLLABUS:

MODULE – I: STONES, BRICKS AND AGGREGATES (09)

Properties of building stones, relation to their structural requirements. Classification of stones, stone quarrying, precautions in blasting, dressing of stone, composition of good brick earth, various methods of manufacture of bricks, Comparison between clamp burning and kiln burning; Fine aggregate: Natural and manufactured: Sieve analysis, specific gravity, bulking, moisture content, deleterious materials; Coarse aggregate: Natural and manufactured: Importance of size, shape and texture.

MODULE – II: CEMENT AND ADMIXTURES (09)

Various types of cement and their properties; Various file and laboratory tests for cement; Various ingredients of cement concrete and their importance, various tests for concrete-Field tests, admixtures- mineral and chemical admixture.

MODULE – III: ALTERNATIVE MATERIALS AND MASONRY (09)

Wood - structure, properties, seasoning of timber; Classification of wood, defects in timber; Alternative materials for wood - galvanized iron, fiber reinforced plastics, steel, aluminum and glass.

Masonry - types of masonry, English and Flemish bonds, rubble and ashlar masonry.

MODULE – IV: BUILDING COMPONENTS (09)

Lintels, arches, different types of floors-concrete, mosaic, terrazzo floors; Roofs - pitched, flat and curved roofs, lean-to-roof, coupled roofs, RCC roofs, madras terrace and shell roofs. Trussed roofs- king and queen post trusses; Foundations: Shallow foundations, spread, combined, strap and mat footings. Stair case: Definitions, technical terms and types of stairs, requirements of good stairs, introduction to geometrical design of stairs, lifts, ramps, elevators and escalators – types and purpose.

MODULE – V: BUILDING PLANNING (09)

Building planning - significance, scope, principles of building planning, classification of buildings and building by laws, Introduction to National Building Codes (NBC) – guidelines and regulations.

V. TEXT BOOKS

1. S. K. Duggal, “Building Materials”, New Age International (P) Limited, 4th Edition, 2016, National Building Code (NBC) of India.
2. Dr. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, “Building Construction, Laxmi Publications (P) Ltd., New Delhi.
3. Rangawala S. C. “Engineering Materials”, Charter Publishing House, Anand, India.

VI. REFERENCE BOOKS

1. Sushil Kumar “Building Materials and construction”, Standard Publishers, 20th Edition, reprint, 2015.
2. P C Vergese, “Building Materials”, PHI Learning Pvt. Ltd, 2nd Edition, 2015.
3. Building Materials and Components, CBRI, India, 1990.
4. Jagadish. K.S, “Alternative Building Materials Technology”, New Age International, 2007.
5. M. S. Shetty, “Concrete Technology”, S. Chand & Co. New Delhi, 2005.

VII. WEB REFERENCES

1. <http://nptel.ac.in/courses/105102088/>
2. <http://nptel.ac.in/courses/105101088/>

VIII.E-TEXTBOOKS

1. <http://www.freeengineeringbooks.com/civil-books-download/building-materials-construction.php>
2. <http://www.freeengineeringbooks.com/civil-books-download/building-materials.php>