

BUILDING MATERIALS, CONSTRUCTION AND PLANNING

III Semester: CE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACEB02	Core	L	T	P	C	CIA	SEE	Total
		3	1	-	4	30	70	100
Contact Classes: 45		Tutorial Classes: 15		Practical Classes: Nil			Total Classes: 60	
<p>COURSE OBJECTIVES: The course should enable the students to:</p> <p>I. Develop knowledge of material science and behaviour of various building materials used in construction. II. Identify the construction materials required for the assigned work. III. Provide procedural knowledge of the simple testing methods of cement, lime and concrete etc. IV. List the requirements and different types of stairs.</p> <p>COURSE OUTCOMES (COs):</p> <p>CO 1: Understand the types, properties of stones, manufacturing process of bricks, types of bricks and aggregates. CO 2: Describe the different types of cements, admixtures, manufacturing process, properties of cement, ingredients of cement concrete and tests conducted on concrete. CO 3: Identify the components of building, types of foundations and differentiate types of materials depending on its function. CO 4: Describe the properties of wood, aluminium, glass and different types of wood, masonry used in buildings. CO 5: Explain principles of building planning, building by laws, classification of buildings and stairs.</p> <p>COURSE LEARNING OUTCOMES (CLOs):</p> <ol style="list-style-type: none"> 1. Predict the properties of building stones and its classifications. 2. Understand the concept of various methods of manufacture of bricks. 3. Identify rock using basic geological classification systems. 4. Obtain differentiate the fine aggregates and coarse aggregates under various views. 5. Explain various types of cements and their applications in construction. Various field and laboratory tests on cement. 6. Analyze the importance of mineral and chemical admixtures, requirements of the concrete in construction. 7. Explain different types of lintel, arches and the materials which are commonly used for construction. 8. Explain the suitability of floors in buildings like mosaic flooring, terrazzo flooring, rubber flooring, asphalt flooring. 9. Understand the different types of trusses, RCC roofs, and madras terrace/shell roofs. 10. Explain the foundations and uses of different types of foundations. 11. Develop the building walls and foundations how they will help for buildings and details to precise the type of footings. 12. Explain the classification of various types of woods. State the properties, seasoning of timber. 13. Understand the types of properties of aluminium and manufacture of glass. 								

14. Differentiate the uses of Galvanized iron, fiber-reinforcement plastics, steel and aluminium in construction.
15. Understand masonry, English and Flemish bonds. Finishing plastering painting and know about building services.
16. Explain Geometrical design of RCC doglegged and open-well stairs. Classification of staircase and technical terms and types of stairs.
17. Principle of building planning and by laws and standards of building material Components and orientation of the building.
18. Possess the knowledge and skills for employability and to succeed in national and international level competitive examinations.
19. Understand the requirements of good stairs.
20. Design RCC doglegged and open-well stairs.

MODULE -I	STONES, BRICKS AND AGGREGATES:	Classes: 09
<p>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, zoning, specify gravity, bulking, moisture content, deleterious materials; Coarse aggregate: Natural and manufactured: Importance of size, shape and texture.</p>		
MODULE -II	CEMENT AND ADMIXTURES	Classes: 09
<p>Various types of cement and their properties; Various field and laboratory tests for cement; Various ingredients of cement concrete and their importance, various tests for concrete; Field and lab tests, admixtures, mineral and chemical admixture.</p>		
MODULE -III	BUILDING COMPONENTS AND FOUNDATIONS	Classes: 09
<p>Lintels, arches, different types of floors-concrete, mosaic, terrazzo floors, pitched, flat and curved roofs, lean-to-roof, coupled roofs, trussed roofs, king and queen post trusses; RCC roofs, madras terrace/shell roofs.</p> <p>Foundations: Shallow foundations, spread, combined, strap and mat footings.</p>		
MODULE -IV	WOOD, ALUMINUM AND GLASS	Classes: 09
<p>Structure, properties, seasoning of timber; Classification of various types of woods used in buildings, defects in timber; Alternative materials for wood, galvanized iron, fibre-reinforced plastics, steel, aluminium; Types of masonry, English and Flemish bonds, rubble and ashlar masonry, cavity and partition walls.</p>		
MODULE -V	STAIRS AND BUILDING PLANNING	Classes: 09
<p>Stairs: Definitions, technical terms and types of stairs, requirements of good stairs; Geometrical design of RCC doglegged and open-well stairs; Principles of building planning, classification building and planning and building by laws.</p>		
Text Books:		
<ol style="list-style-type: none"> 1. S. K. Duggal, "Building Materials", New Age International Publishers, 3rd revised edition, 2008. 2. Sushil Kumar "Building Materials and construction", Standard Publishers, 20th edition, reprint, 2015. 3. Dr.B. C. Punmia, Ashok kumar Jain, Arun Kumar Jain, "Building Construction", Laxmi Publications (P) ltd., New Delhi. 4. Rangwala S. C. "Engineering Materials", Charter Publishing House, Anand, India 		

Reference Books:

1. PC Verghese, "Building Construction", PHI.
2. R. Chuddy, "Construction Technology", Vol 1&2, Longman UK.
3. Subhash Chander, "Basic Civil Engineering", Jain Brothers.

Web References:

1. <https://nptel.ac.in/courses/105102088/>