

## BUILDING MATERIALS, CONSTRUCTION AND PLANNING

<b>III Semester: CE</b>								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
ACEB02	Core	L	T	P	C	CIA	SEE	Total
		3	1	-	4	30	70	100
<b>Contact Classes: 45</b>		<b>Tutorial Classes: 15</b>		<b>Practical Classes: Nil</b>			<b>Total Classes: 60</b>	
<p><b>COURSE OBJECTIVES:</b>  <b>Students will try to learn:</b></p> <ol style="list-style-type: none"> <li>I. The importance and fundamental knowledge of building materials such as stones, bricks, aggregates, cements and its properties for better construction</li> <li>II. The laboratory, field tests conducted on cement, concrete, admixtures and other building materials to identify better construction materials with strength &amp; durability.</li> <li>III. The methods employed for finding out various properties of building materials also acquire the knowledge on building components and its requirements</li> <li>IV. The utilization of building materials in effective way by understanding principals of building planning based on National building code (NBC) guidelines.</li> </ol> <p><b>COURSE OUTCOMES:</b></p> <p>CO 1: <b>Recognize</b> appropriate building materials used in the civil engineering applications for obtaining better performance of structures.</p> <p>CO 2: <b>Explain</b> various physical and mechanical properties of building materials used in construction of structures to compute their strength and durability.</p> <p>CO 3: <b>Summarize</b> various methods employed to find out the properties of building materials and their applications in the construction.</p> <p>CO 4: <b>Identify</b> the mineral and chemical admixtures for enhancing the strength and durability of concrete mixtures.</p> <p>CO 5: <b>Select</b> suitable type of truss, RCC roof, and madras terrace/shell roofs as per structural need to sustain applied loads successfully.</p> <p>CO 6: <b>Outline</b> different types of lintel, arches and the materials which are commonly used in construction to prevent the entry of rainwater inside the building.</p> <p>CO 7: <b>Choose</b> suitable floors in buildings like mosaic flooring, terrazzo flooring, rubber flooring, asphalt flooring used in modern construction to enhance the elegance and performance.</p> <p>CO 8: <b>Select</b> appropriate building walls and foundations capable of bearing and transferring applied loads successfully to the foundation of the building.</p> <p>CO 9: <b>Distinguish</b> the difference of use among Galvanized iron, fiber-reinforcement plastics, steel, wood and aluminum in construction as</p> <p>CO 10: <b>Outline</b> the building by-laws and standards of building Components and orientation which will provide guidelines for better planning and construction as per engineering specifications.</p> <p>CO 11: <b>Explain</b> various types of stair cases used in modern construction scenario to improve the accessibility of building floors.</p>								

<b>MODULE -I</b>	<b>STONES, BRICKS AND AGGREGATES</b>	<b>Classes: 09</b>
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, specific gravity, bulking, moisture content, deleterious materials; Coarse aggregate: Natural and manufactured: Importance of size, shape and texture.		
<b>MODULE -II</b>	<b>CEMENT AND ADMIXTURES</b>	<b>Classes: 09</b>
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.		
<b>MODULE -III</b>	<b>BUILDING COMPONENTS AND FOUNDATIONS</b>	<b>Classes: 09</b>
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.  Foundations: Shallow foundations, spread, combined, strap and mat footings.		
<b>MODULE -IV</b>	<b>WOOD, ALUMINUM AND GLASS</b>	<b>Classes: 09</b>
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.		
<b>MODULE -V</b>	<b>STAIRS AND BUILDING PLANNING</b>	<b>Classes: 09</b>
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.		
<b>Text Books:</b>		
<ol style="list-style-type: none"> <li>1. S. K. Duggal, "Building Materials", New Age International Publishers, 3<sup>rd</sup> revised edition, 2008.</li> <li>2. Sushil Kumar "Building Materials and construction", Standard Publishers, 20<sup>th</sup> edition, reprint, 2015.</li> <li>3. Dr. B. C. Punmia, Ashok Kumar Jain, Arun Kumar Jain, "Building Construction", Laxmi Publications (P) Ltd., New Delhi.</li> <li>4. Rangawala S. C. "Engineering Materials", Charter Publishing House, Anand, India</li> </ol>		
<b>Reference Books:</b>		
<ol style="list-style-type: none"> <li>1. PC Verghese, "Building Construction", PHI.</li> <li>2. R. Chuddy, "Construction Technology", Vol 1&amp;2, Longman UK.</li> <li>3. Subhash Chander, "Basic Civil Engineering", Jain Brothers.</li> </ol>		
<b>Web References:</b>		
<ol style="list-style-type: none"> <li>1. <a href="https://nptel.ac.in/courses/105102088/">https://nptel.ac.in/courses/105102088/</a></li> </ol>		