

## 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			
<b>Contact Classes: 45</b>		<b>Tutorial Classes: 15</b>		<b>Practical Classes: Nil</b>		<b>Total Classes: 60</b>					
<p><b>I. COURSE OVERVIEW:</b>            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.</p> <p><b>II. OBJECTIVES:</b>  <b>The course should enable the students to:</b></p> <p>I The basics of material science and behavior of various building materials used in construction</p> <p>II The construction materials required for the assigned work.</p> <p>III The procedural knowledge of the simple testing methods of cement, lime and concrete etc.</p> <p>IV The requirements and different types of stairs.</p> <p><b>III. COURSE OUTCOMES:</b>  <b>After successful completion of the course, students should be able to:</b></p> <p>CO 1 <b>Recognize appropriate building materials used for obtaining better performance of structures in the civil engineering applications.</b> Remember</p> <p>CO 2 <b>Identify the mineral and chemical admixtures for enhancing the strength and durability of concrete mixtures.</b> Understand</p> <p>CO 3 <b>Distinguish the difference among Galvanized iron, Fiber -reinforcement plastics, steel, wood and aluminum for the construction of doors and windows.</b> Understand</p> <p>CO 4 <b>Select suitable type of truss, RCC roof, and madras terrace as per structural need for sustaining applied loads successfully.</b> Understand</p> <p>CO 5 <b>Choose various types of stair cases used in modern construction scenario for improving the accessibility of building floors.</b> Understand</p> <p>CO 6 <b>Outline building by-laws and standards of building Components for better planning and construction.</b> Understand</p> <p><b>IV. SYLLABUS:</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"><b>MODULE - I</b></td> <td style="width: 60%;"><b>STONES, BRICKS AND AGGREGATES</b></td> <td style="width: 20%;"><b>Classes: 09</b></td> </tr> </table> <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>									<b>MODULE - I</b>	<b>STONES, BRICKS AND AGGREGATES</b>	<b>Classes: 09</b>
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<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 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, fiber-reinforced plastics, steel, aluminum; 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. Sushil Kumar “Building Materials and construction”, Standard Publishers, 20th edition, reprint, 2015.</li> <li>2. Dr. B.C.Punmia, Ashok kumar Jain, Arun Kumar Jain, “Building Construction, Laxmi Publications (P) ltd., New Delhi.</li> <li>3. Rangawala S. C. “Engineering Materials”, Charter Publishing House, Anand, India.</li> </ol>		
<b>Reference Books:</b>		
<ol style="list-style-type: none"> <li>1. S. K. Duggal, “Building Materials”, New Age International (P) Limited, 4<sup>th</sup> Edition, 2016</li> <li>2. National Building Code (NBC) of India</li> <li>3. P C Vergese, “Building Materials”, PHI Learning Pvt. Ltd, 2<sup>nd</sup> Edition, 2015.</li> <li>4. Building Materials and Components, CBRI, India, 1990.</li> <li>5. Jagadish. K.S, “Alternative Building Materials Technology”, New Age International, 2007.</li> <li>6. M. S. Shetty, “Concrete Technology”, S. Chand &amp; Co. New Delhi, 2005.</li> </ol>		
<b>Web References:</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://nptel.ac.in/courses/105102088/">http://nptel.ac.in/courses/105102088/</a></li> <li>2. <a href="http://nptel.ac.in/courses/105101088/">http://nptel.ac.in/courses/105101088/</a></li> </ol>		
<b>E-Text Books:</b>		
<ol style="list-style-type: none"> <li>1. <a href="http://www.freeengineeringbooks.com/civil-books-download/building-materials-construction.php">http://www.freeengineeringbooks.com/civil-books-download/building-materials-construction.php</a></li> <li>2. <a href="http://www.freeengineeringbooks.com/civil-books-download/building-materials.php">http://www.freeengineeringbooks.com/civil-books-download/building-materials.php</a></li> </ol>		