**17CE4XO4 – BUILDING PLANNING AND CONSTRUCTION TECHNIQUES**

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| **Course Category** | Open Elective | **Credits** | 3 |
| **Course Type** | Theory | **Lecture - Tutorial - Practical** | 3 - 0 - 0 |
| **Prerequisite** | Building Materials | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course Objectives** | 1. To study about the basic building materials, properties and their applications. 2. To study the various cementitious materials. 3. To understand different types of smart construction materials and their applications. 4. To know the various types of the building components. 5. To understand the techniques of damp proofing and finishing works of the building. 6. To understand the various factors considered in planning and construction of buildings. | |
| **Course Outcomes** | CO1 | Understand various types of stones and methods of manufacturing of bricks and tiles. |
| CO2 | Identify the importance of ingredients of lime, cement and concrete. |
| CO3 | Identify the properties of smart construction materials alternative for cement and also be able to understand various types of masonry construction. |
| CO4 | Understand various building components and their various types. |
| CO5 | Understand the techniques and importance of damp proofing and finishing works of the building. |
| CO6 | Identify the factors to be considered in planning and construction of buildings and Plan a building following the bye-law**s** |

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| **Course**  **Content** | **UNIT – I**  **BUILDING MATERIALS -I:**  **Stones:** Properties of building stones – Relation to their structural requirements – Classification of stones.  **Bricks:** Composition of good brick earth, various types of bricks.  **Tile**: Characteristics of good tile and types of tiles.  **UNIT – II**  **BUILDING MATERIALS–II:**  **Lime:** Various ingredients of lime –Constituents of lime stone – Classification of lime.  **Cement:** Portland cement – Chemical Composition – Hydration, setting and fineness of cement – 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.  **UNIT – III**  **WOOD:** Introduction– Classification of timber (IS: 399) – Characteristics of good timber– Defects in timber – Types and Uses of Ply-wood and Engineered wood. –Uses of materials like Aluminum, Gypsum, Glass and Bituminous materials.  **SMART CONSTRUCTION MATERIALS:** Overview and use of Fly ash, Silica fume, Carbon fibers, Self-healing materials and Fiber reinforced plastics – Benefits of Nano-technology in construction industry.  **BUILDING STRUCTURES–I:**  **Masonry:** Types of masonry – English and Flemish bonds – Cavity, partition and shear walls.  **UNIT – IV**  **BUILDING STRUCTURES–II:**  **Building Components:** Lintels – Arches – Vaults – Stair cases.  **Floors:** Different types of floors – Concrete – Mosaic and Terrazzo floors.  **Roofs:** Pitched roofs – Lean to roof – Coupled Roofs – Trussed roofs – King and Queen post Trusses – Flat roofs – R.C.C Roofs – Doors and windows.  **UNIT – V**  **BUILDING FINISHES:** Damp Proofing and water proofing materials and uses. Plastering – Pointing – White washing and distempering.  **Paints:** Constituents of paint – Types of paints –Painting of new/old wood – Varnish.  **UNIT – VI**  **BUILDING PLANNING :** Terms used in building drawing as per NBC – Factors affecting in selection of site – Functional requirements of a residential building – Minimum size requirements as per NBC – Standard sizes of Door – Windows and ventilators.  **PLANNING:** Principles of planning – Factors to be considered in Planning – Planning of residential – Buildings – Preliminaries of vaastu. Municipal bye – Law – List of documents to be submitted for building plan approval. |
| **Textbooks**  **and**  **References** | **TEXTBOOKS:**   1. Engineering Materials by S.C. Rangwala. 2. Building Construction by B.C. Punmia. 3. Building Planning and Drawing by Dr. N. Kumara Swamy & A. Kameswara Rao.   **REFERENCE BOOKS:**   1. Building Materials by S.K. Duggal. 2. A Text Book of Building Construction by S.K. Sharma & B.K.Kaul. 3. Building Construction by Sushil Kumar. 4. Indian Standard Institution, National Building Code of India, ISI, 1984, New Delhi. |