**N.B.K.R INSTITUTE OF SCIENCE &TECHNOLOGY:: VIDYANAGAR**

**(AUTONOMOUS)**

**19CE1202-BUILDING MATERIALS AND CONSTRUCTION**

(Civil Engineering)

(New Regulations w. e. f. 2019-2020)

I B.TECH – II Semester

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| **Course category:** | Engineering Science course | **Credits:** | 3 |
| **Course Type:** | Theory | **Lecture - Tutorial - Practical:** | 3-0-0 |
| **Prerequisite:** | None  | **Sessional Evaluation :****End Exam. Evaluation:****Total Marks:** | 4060100 |

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| **Course Objectives** | 1. To know the significance of various building materials used in construction industry.
2. To explain the materials used in concrete and different types of mortars and their applications.
3. To explain various types masonry construction
4. To explain various types of building components.
5. To explain types of roofs and roof coverings and temporary works used in buildings
6. To learn about types of wall finishes and thermal and acoustic insulating materials in buildings.
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| **Course Outcomes** | CO1 | Gain an in-depth knowledge on types of building materials used in construction. |
| CO2 | Gain an in-depth knowledge on components of concrete and mortars. |
| CO3 | Understand various types of buildings and masonry. |
| CO4 | Understand various types of building components and their construction practices. |
| CO5 | Understand the various types of roofs and temporary works in construction. |
| CO6 | Know various roof coverings and special treatments for thermal and acoustic insulation materials. |
| **Course Content** | **UNIT – I****INTRODUCTION TO BUILDING MATERIALS**Stone: Dressing of stones- Artificial stones and applications-Wood: classification of timber- characteristics of good timber- ply wood- types and uses- Modern building materials- Bricks: Manufacturing process- testing of bricks- Ceramic products: Manufacturing process- Glass: Functions of glass in buildings- manufacturing process- special glass- Advantages and disadvantages- Building materials for low cost housing- Utilisation of waste for alternative building materials- Sustainable materials in construction- National Standards**UNIT- II****CEMENT CONCRETE AND MORTARS****Constituents of Cement Concrete****Cement:** Manufacturing process- types of cement- Portland cement- hydration of cement- tests of cement- National standards**Aggregate**: Introduction- Classification of aggregate- Characteristics- National standards**Water:** Quality of mixing water**Building Mortars**Introduction- Classification (Cement mortar, lime mortar, lime-cement mortar, special mortar) - Characteristics of good mortar- grouting- guniting.**UNIT- III****MASONRY CONSTRUCTION****Introduction to Building Components**Types of buildings- Components of buildings- Types and uses of shallow and deep foundations**Stone masonry:** Technical terms –Joints – Types – Random (un-coarsed) rubble –Coarsed rubble –Dry rubble masonry – Ashlar masonry–Ashlar fine – chamfered fine – Supervision.**Brick masonry:** Technical terms – bonds in brick work- English bond – single & double Flemish bond –Defects – Comparison of Brick masonry and stone masonry.**Cavity walls**: Brick cavity walls- position of cavity at foundation, roof and opening levels**UNIT- IV****BUILDING COMPONENTS****Lintels and arches:** Lintels: types- construction- Arches: Technical terms- types (brick arches, rough, axed stone arches, flat and semi circular arches)**Doors:** Location- Technical terms – Types – Suitability**Windows:** Location – Types – Suitability – Fixtures and fastenings**Stairs and Stair cases:** technical terms- Requirements of good stair – classification- elevators and escalators**Floorings**Introduction- Requirements of a good floor- types of floorings: cement concrete (regular and precast)- mosaic- tiled- marble- timber**UNIT- V****ROOFS AND FORM WORK****Roofs and Roof coverings**Technical terms- classification (pitched roofs and flat roofs)- advantages and disadvantages- Roof coverings: A.C sheets and G.I sheets**Temporary works**Form work: Introduction- Stripping of formwork- timbering in trenches- types of Scaffolding- shoring and underpinning. **UNIT– VI****WALL FINISHES AND SPECIAL TREATMENTS****Wall finishes**Plastering: objectives of plastering- requirements of good plaster- types of mortars for plastering- tools using in plastering - types of pointing**Thermal Insulation**Introduction- thermal properties and selection of the insulating materials- classification of thermal insulating materials - methods of thermal insulation**Acoustical Construction**Introduction- Characteristics of audible sound- behaviour of sound in enclosure- reflection of sound- Reverberation and absorption- types of acoustic materials |
| **Textbooks****& Reference Books** | **TEXTBOOKS:** 1. Engineering Materials by S.C Rangwala.2. Building construction by Dr. B. C. Punmia.3. A Text Book of Building Construction and Construction Materials 4th Edition by T. D. Ahuja, G. S. Birdie.**REFERENCES:** 1. Building construction by S. C. Rangwala.2. Building and Construction Materials : Testing and Quality Control 1st Editionby M. L. Gambhir, NehaJamwal.3. Indian Standard Institution, National Building Code of India, ISI, 1984, New Delhi. |