# Department of Civil Engineering and Applied Mechanics
## Lesson Plan B. Tech II Year
## CE21015 Engineering Material
### Semester: III

| S.No. | Topic covered (Theory) | Session 2024-25 LECTURE NO |
|---|---|---|
| | **Unit-1 (Lime & Clay Products)** | |
| 1 | **Lime:** Introduction, general terminology, Classification of lime , properties, BIS 712-1984(Classification of lime) | Lecture No 01 |
| 2 | Comparison of fat and hydraulic lime, Manufacture (calcination of lime stone & Slaking). | Lecture No 02 |
| 3 | Slaking of lime, Properties of Lime & Uses of lime, I.S. specification & tests. | Lecture No 03 |
| 4 | **Clay Products:** Introduction of bricks, composition, Classification , tests for bricks ,qualities of good brick. | Lecture No 04 |
| 5 | Manufacturing of bricks. | Lecture No 05 |
| 6 | Tiles, Different kinds of tiles, manufacture of tiles, Terra-cotta, Porcelain | Lecture No 06 |
| 7 | Earthenware and Stoneware, Refractory materials, classification, and properties. | Lecture No 07 |
| | **Unit-2 (Glass, Timber & plastics)** | |
| 8 | **Glass:** Introduction, function of glass in buildings, constituents and classification of glass, | Lecture No 08 |
| 9 | Manufacturing process of glass, treatments, , different types of glasses and their applications (Uses). | Lecture No 09 |
| 10 | **Timber:** Introduction, classification and parts of tree, Structure of exogenous tree. | Lecture No 10 |
| 11 | Physical and Mechanical properties of timber. Conversion of timber. | Lecture No 11 |
| 12 | Defects and Decay in timber. | Lecture No 12 |
| 13 | Seasoning of timber (methods), Preservation, timber products, quality of good timber and uses. | Lecture No 13 |
| 14 | **Plastics:** Introduction, polymerization, Classification of plastics , Characteristics of plastics | Lecture No 14 |
| 15 | Properties, moulding and fabrication of plastic products and its uses. | Lecture No 15 |
| | **Unit-3 (Rubber, organic coating & Laminates and Adhesives)** | |
| 16 | **Rubber:** Introduction, Classification of rubber, vulcanization, compounding of rubber, reclaimed rubber. | Lecture No 16 |
| 17 | **Organic Coating:** Ingredients, Types, Luminescent Coating, Fire Retarding Coating. | Lecture No 17 |
| 18 | **Laminates :** Definitions, Types, Laminated Wood, Compressed Laminated, | Lecture No 18 |
| 19 | **Adhesives:** Definitions, Classification of adhesives ,Plastic, Avtex. | Lecture No 19 |
| | **Unit-4 (Concrete)** | |
| 20 | Concrete: Introduction of concrete Materials: | Lecture No 20 |

| | Cement, Aggregate.<br>Components of cement, Manufacturing of cements, compounds. | |
|----|------------------------------------------------------------------------------------|----------------|
| 21 | Hydration of cement, heat of hydration, Classification of cement. | Lecture No 21 |
| 22 | Aggregate: source, classification, water to cement ratio. | Lecture No 22 |
| 23 | Admixtures: Classification and properties. | Lecture No 23 |
| 24 | Properties of fresh concrete : Workability, factors affecting workability, Measurement of workability, segregation, and Bleeding. | Lecture No 24 |
| 25 | Tensile and Compressive Strength, Modulus of Elasticity, Effect of Shrinkage and Creep. | Lecture No 25 |
| 26 | Mixing, Transporting, Placing, Compaction, Finishing, Curing, Quality Control. | Lecture No 26 |
| 27 | Design of Concrete Mixes. Introduction, Basic Considerations, Factors | Lecture No 27 |
| 28 | Methods of proportioning DOE, ACI, Guidelines of BSI Methods | Lecture No 28 |
| 29 | ACI Method of concrete of mix design | Lecture No 29 |
| 30 | IS Method of concrete of mix design | Lecture No 30 |
| 31 | DOE Method of concrete of mix design | Lecture No 31 |
| 32 | Mix design problem. | Lecture No 32 |
| **Unit -5(Heat Insulating and Acoustic Materials)** | | |
| 33 | Heat Insulating: Classification, Composition, Tests, | Lecture No 33 |
| 34 | Acoustic Materials: Classification, Composition, Tests, reverberation. | Lecture No 34 |
| 35 | Sound Absorption, types of Acoustical Materials, Acoustical Treatment, | Lecture No 35 |
| 36 | Noise and its affects , Noise Reduction | Lecture No 36 |
| 37 | Material Science: Inter atomic bonds, bonding force, bond energy, intermolecular bonds, thermal energy | Lecture No 37 |
| 38 | Classification of solids, imperfections solids. | Lecture No 38 |
| 39 | Behaviour of materials under compression, tension, bending, fatigue, creep, hardness, | Lecture No 39 |
| 40 | Behaviour of common materials under different loadings: Concrete, Steel, Timber, Plastics, Glass. | Lecture No 40 |

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## Department of Civil Engineering and Applied Mechanics
## Lesson Plan B. Tech II Year
## CE 21003 STRENGTH OF MATERIAL
### Semester: III

| Session No | Unit # | Topic |
|---|---|---|
| 1/2 | | Introduction, Stress and Strain, Normal and Shear Stresses and Strains Hooke's Law and Poisson's Ratio, Complementary Shear. |
| 3/5 | 1 | Relations between the Elastic Constants. Mechanical Properties of Materials: Strength, Stiffness, Elasticity, Plasticity, Toughness, Hardness, Ductility etc. Ultimate Strength, Working stress and Factor of safety |
| 6/8 | | Stresses on Oblique Planes. Principal planes and Principal stress and strains. Mohr's stress circle. |
| 9/10 | | Introduction to Bending Moment and Shear Force. Bending Moment and Shear Forces at a Section of a cantilever Beams subject to Vertical Loads, Inclined Loads and Couples |
| 11/13 | 2 | Bending Moment and Shear Forces at a Section of a simply supported, overhang Beam subject to Vertical Loads, Inclined Loads and Couples. Condition of maximum bending moment to be as minimum as possible. |
| 14/15 | | Relation between B.M., S.F. and Loads. Graphical Methods for drawing B.M. diagram and S.F. diagram. |
| 16/17 | | Introduction of Stresses due to Bending. Assumptions and derivation of principal equation of Bending. |
| 18/19 | 3 | Modulus of Section and Modulus of Rupture. Types of problems in bending. |
| 19/20 | | Beams of uniform strength and flitched beams |
| 21 | | Introduction to Deflection of Beams. Uniform Curvature. Relation between the Deflection, Curvature and Bending Moment. |
| 22/24 | 4 | Slopes and Deflection of Beams. Macaulay's method. |
| 25/26 | | Moment area method. |
| 27/28 | | Conjugate beam method. |
| 29/30 | | Introduction to shear stresses in beams. Derivation of principal equation of shear stress. Shear stress distribution in different shapes of beams viz. rectangular, circular and flanged sections. |
| 31/32 | 5 | Torsion of Shafts. Pure Torsion. Twisting of Solid and Hollow Circular Cross Sections. Derivation of principal equation of torsion. |
| 33/34 | | Transmission of Power by Circular Shafts. Design of Shafts. Combined Bending and Twisting. |

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**Department of Civil Engineering and Applied Mechanics**
**Lesson Plan B. Tech IIyear**
**CE:21007 BUILDING PLANNING & ARCHITECTURE**
**Semester: III**

| S.No. | Topic covered (Theory) | Session 2024-25 LECTURE NO |
|---|---|---|
| 1 | Introduction of building elements | Lecture No 01 |
| 2 | Substructure definition and functions | Lecture No 02 |
| 3 | Superstructure definition and their functions | Lecture No 03 |
| 4 | Regulation and bye laws | Lecture No 04 |
| 5 | Setback and open spaces | Lecture No 05 |
| 6 | Ground coverage and FAR | Lecture No 06 |
| 7 | Site planning and infrastructure provision | Lecture No 07 |
| 8 | Orientation and climate considerations | Lecture No 08 |
| 9 | Design for solar radiation | Lecture No 09 |
| 10 | Ventilation and lighting, noise reduction | Lecture No 10 |
| 11 | Space standards for various functions | Lecture No 11 |
| 12 | Optimization of space | Lecture No 12 |
| 13 | Services: artificial lighting & ventilation | Lecture No 13 |
| 14 | Sanitation | Lecture No 14 |
| 15 | Design principles of staircase | Lecture No 15 |
| 16 | Meaning and role of architecture in planning | Lecture No 16 |
| 17 | Introduction to roman and Greek architecture | Lecture No 17 |
| 18 | Introduction to Buddhist architecture | Lecture No 18 |
| 19 | Introduction to Islamic & Hindu architecture | Lecture No 19 |
| 20 | Architectural composition: elements of composition | Lecture No 20 |
| 21 | Unity, symmetry and balance, proportion and scale | Lecture No 21 |
| 22 | System characteristics: texture, pattern and color | Lecture No 22 |
| 23 | Expression working drawings: Plan elevation and section | Lecture No 23 |
| 24 | Site plan and detailing | Lecture No 24 |
| 25 | Elements of perspective view | Lecture No 25 |
| 26 | Parallel and oblique perspective | Lecture No 26 |

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