III B. Tech – II Semester

(20CE6403) BUILDING MATERIALS & CONCRETE TECHNOLOGY

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	-	-	3

Pre-Requisites:

Course Outcomes:

- The student can able to
- Identify different building materials and expected to differentiate brick masonry, stone masonry
- Identify different types of cements, aggregates & admixtures
- Familiarize with ingredients of concrete and design the concrete mix by BIS method
- Gain knowledge of Fresh concrete & Hardened concrete
- Determine the behavior of concrete

UNIT-I:

Stones, Bricks, Masonry & Wood:

Stones: Properties of building stones – classification of stones – stone quarrying – precautions in blasting, dressing of stone,

Bricks: composition of good brick earth, various methods of manufacturing of bricks.

Masonry: Types of masonry, English and Flemish bonds, Rubble and Ashlar Masonry.

Wood: Structure – Properties- Seasoning of timber- Classification of various types of woods used in buildings- Defects in timber.

UNIT-II:

Cement, Aggregates &Admixtures:

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.

Aggregates

Classification of aggregates – Particle shape & texture – Bond, strength & other mechanical properties of aggregates – Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate Bulking of sand – Sieve analysis

Admixtures – Mineral and Chemical Admixtures – Accelerators, Retarders, Air Entertainers, Plasticizers, Super Plasticizers

UNIT-III:

Concrete &Mix Design

Ingredients of cement concrete and their importance, Water / Cement ratio

Mix Design:

Factors in the choice of mix proportions – Durability of concrete – Quality Control of concrete – Statistical methods – Acceptance criteria – Concepts Proportioning of concrete mixes by various methods – BIS method of mix design.

UNIT-IV:

Fresh Concrete:

Steps in Manufacture of Concrete–proportion, mixing, placing, compaction, finishing, curing, Properties of fresh concrete-Workability – Factors affecting workability – Measurement of workability by different tests, Segregation & bleeding – Mixing and vibration of concrete

Hardened Concrete:

Abram's Law – Gel space ratio – Nature of strength of concrete –Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compression & tensile strength, Factors affecting strength, Compression tests, Tension tests, Flexure tests, Splitting tests.

UNIT-V:

Elasticity, Creep & Shrinkage:

Modulus of elasticity, Dynamic modulus of elasticity, Poisson's ratio, Creep of concrete, Factors influencing creep, Relation between creep & time, Nature of creep, Effects of creep – Shrinkage –types of shrinkage.

Text Books:

1. Building Materials by S.S. Bhavikatti, Vices publications Houseprivate ltd.
2. Building Construction by S.S. Bhavikatti, Vices publications Houseprivate ltd.
3. Building Materials by B.C. Punmia, Laxmi Publications private ltd.
4. Concrete Technology by M. S. Shetty. – S. Chand & Company
5. Concrete Technology by A. R. Santha Kumar, Oxford University Press, New Delhi

References:

1. Building Materials by S.K.Duggal, New Age InternationalPublications.
2. Building Materials by P.C.Verghese, PHI learning (P) ltd.