| **4th Semester** | **RCI4D002** | **Concrete Technology** | **L-T-P 3-0-0** | **3 CREDITS** |
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**Module- I (10 hrs)**

**Cement**: Portland cement- chemical composition, Hydration, Setting of cement, Structure of hydrate cement, Test on physical properties, Different grades of cement.

**Admixtures**: Types of admixtures - mineral and chemical admixtures -properties - dosages - effects - usage.

**Aggregates:**Classification of aggregate, Particle shape & texture, Bond, strength & other mechanical properties of aggregate, Specific gravity, Bulk density, porosity, adsorption & moisture content of aggregate, Bulking of sand, Deleterious substance in aggregate, Soundness of aggregate, Alkali aggregate reaction, Thermal properties, Sieve analysis, Fineness modulus , Grading curves, Grading of fine & coarse Aggregates, Gap graded aggregate, Maximum aggregate size.

**Module-II (10 hrs)**

**Fresh concrete:** Workability - Factors affecting workability, Measurement of workability by different tests, Setting times of concrete, Effect of time and temperature on workability , Segregation & bleeding, Mixing and vibration of concrete, Steps in manufacture of concrete , Quality of mixing water.

**Hardened concrete:** Water Cement ratio , Abram's Law, Nature of strength of concrete, Maturity concept , Strength in tension & compression, Factors affecting strength, Relation between compression & tensile strength, Curing.

**Module-III (10hrs)**

**Testing of hardened concrete**: Compression tests, tension tests, factors affecting strength , flexure tests , splitting tests , pull-out rest, non-destructive testing methods - codal provisions for NDT.

**Elasticity, creep & shrinkage** : modulus of elasticity, dynamic modulus of elasticity, posisson's ratio, creep of concrete, factors influencing creep, relation between creep & time , nature of creep, effects of creep , shrinkage , types of shrinkage.

**Module- IV (7 hrs)**

**Mix design** :Factors in the choice of mix proportions , Durability of concrete, Quality Control of concrete , Statistical methods , Acceptance criteria, Proportioning of concrete mixes by various methods , BIS method of mix design.

**Module- V (8 hrs)**

**Special concretes:** Light weight aggregates - Light weight aggregate concrete - Cellular concrete - **No-fines concrete** - High density concrete -Fibre reinforced concrete - Polymer concrete - Types of Polymer concrete - High performance concrete - Self compacting concrete.

**Books:**


- Concrete Technology - Gambhir, M.L., , McGraw Hill
- Properties of Concrete by A.M.Neville
- Concrete Technology by M.S.Shetty. - S.Chand& Co.
- Concrete Technology by Santakumar A.R, Oxford University Press