HONOURS SUBJECT

PCI3D001 CONCRETE TECHNOLOGY

Module I (10 classes)

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(8 classes)

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(10classes)

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 (8 classes)

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.

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

Text Books

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