3. SYLLABUS

B.Tech. III Year I Sem.

CE3102PC: CONCRETETECHNOLOGY

III-I:CE								
Course Code	Category	Hours/Weak			Credits	Max Marks		
CY3102PC	Core	L	T	P	C	CIE	SEE	Total
		3	0	0	3	30	70	100
Contact Classes:45	Tutorial classes:15	Practical classes: Nil				Total Classes:60		
Prerequisites								

COURSE OBJECTIVES:

Concrete is the basic construction material in the advance and present construction industry Lot of advances are taking place in the concrete technology on par with development taking place in the engineering. The present day industry needs the knowledge of concrete technology thoroughly. The subject is designed to give the basic knowledge as well as latest developments in concrete technology.

COURSE OUTCOMES:

After completing this course, the students will be able to:

- Identify quality control tests on concrete making materials.
- Understand the suitability of aggregates as a construction materials.
- Understand the behavior of fresh concrete.
- Determine the strength of hardened concrete.
- Design concrete mixes as per IS and ASI codes and understand the importance of special concrete.

UNIT - I

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.

UNIT – II

Aggregates: Classification of aggregate – Particle shape & texture –, 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.

UNIT – III

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.

UNIT –IV

Hardened Concrete : Water / Cement ratio – Abram's Law – Gel space ratio – Nature of strength of concrete – Maturity concept – Strength in tension & compression – Factors affecting strength – Relation between compressive & tensile strength - Curing.

Testing Of Hardened Concrete: Compression tests – Tension tests– Flexure tests – Splitting tests – Pull-out test, Non-destructive testing methods – codal provisions for NDT. 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.

UNIT – V

Mix Design: Factors in the choice of mix proportions – Durability of concrete – QualityControl of concrete – Statistical methods – Acceptance criteria – Proportioning of concretemixes by– BIS method and ACI mix design.

Special Concretes: Introduction to light weight concrete – Cellular concrete – No-fines concrete – High density concrete – Fibre reinforced concrete – Polymer concrete – High Tuned Amplifiers: Introduction, Q-Factor, Small Signal Tuned Amplifiers, frequency response of tuned amplifiers. performance concrete – Self compacting concrete.

Text books:

1. Properties of Concrete by A. M. Neville Pearson 5th edition Education ltd 2016
2. Concrete Technology by M.S.Shetty- S.Chand &Co. 2004
3. Concrete Technology by Job Thomas -Cengage learning India Pvt Ltd 2015

References:

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