

Course No  
**CE 212**

Course Name  
**CONCRETE TECHNOLOGY**

L-T-P-Credits  
**(3- 0- 0: 3)**

Prerequisite: nil;

Co requisite: nil

**Course Objectives:**

1. To understand the properties of ingredients of concrete
2. To study about the concrete design mix
3. To study the behaviour of concrete at its fresh and hardened state
4. To know about the procedures in concreting
5. To understand special concrete and their use

**Course Outcome:**

1. To identify the functional role of ingredients of concrete and apply this knowledge to mix design philosophy.
2. To acquire and apply fundamental knowledge in the fresh and hardened properties of concrete.
3. To evaluate the effect of the environment on the service life performance, properties and failure mode of structural concrete and demonstrate techniques of measuring the Non Destructive Testing of concrete structures
4. To develop an awareness of the utilisation of waste materials as novel innovative materials for use in concrete.
5. To design a concrete mix which fulfils the required properties for fresh and hardened concrete

**SYLLABUS**

<b>Module</b>	<b>Contents</b>	<b>Hours</b>
	<b>Introduction</b>	4
I	Concrete materials - Cement: Physical tests on cement - Concrete materials - Tests on aggregates - Quality of Water for mixing and curing - use of sea water for mixing concrete - Mineral and chemical Admixtures.	
	<b>Mix Design</b>	8
II	Factors influencing mix proportion - Mix design by ACI method and I.S. code method.	
	<b>Preparation &amp; Quality control</b>	5
III	Batching - Mixing -Transportation - Placing of concrete - curing of Concrete. Fresh and hardened properties of Concrete - Quality control - Sampling and testing Acceptance criteria.	
	<b>Properties of concrete</b>	8
IV	Creep, Shrinkage and temperature effects of concrete - durability of concrete - permeability of concrete - Corrosion - Causes and effects - remedial measures- Fire resistance of concrete	
	<b>Non Destructive Test</b>	5
V	Rebound hammer and Ultra-sonic pulse velocity testing methods.	
VI	<b>Types of concrete</b>	7
	Special Concrete – Lightweight concrete - Fibre reinforced concrete - Polymer concrete - Ferro cement -Ready mix concrete- High Performance Concrete - Self compacting concrete – Sustainability of concrete.	

**Essential Readings:**

1. Shetty, M.S., Concrete Technology (Theory & Practice), S.Chand and Co, Revised edition, 2015
2. Gambhir, M.L., Concrete Technology, Tata McGraw Hill, fifth edition, 2013.
3. A.M.Neville, Properties of Concrete, Pearson India, fifth edition, 2012
4. A.M.Nevillie and J.J. Brooks, Concrete Technology, Pearson Education India Ltd., 2<sup>nd</sup> Edition, 2016