

Concrete Technology - Video course

COURSE OUTLINE

The basic course on Civil Engineering Materials deals with some fundamentals related to concrete and concrete materials, besides dealing with masonry, steel etc.

The specific course on "Concrete Technology" focuses more on detailed understanding of concrete making materials including supplementary cementitious materials.

Concrete production process also forms a part of the discussion. Recent developments in concrete materials are also given adequate consideration.

Going through the course one would develop adequate understanding on concrete production process and properties and uses of concrete as a modern material of construction.

The courses will enable one to make appropriate decision regarding ingredient selection and use of concrete.

Contents:

Cements, supplementary cementitious material: pozzolans, aggregates and Chemical admixtures.

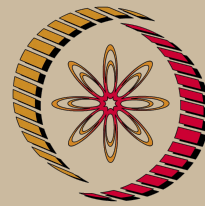
Mix Designs methods and quality control. Concrete Production, batching, Mixing, transporting, placing compaction and curing.

Workability, rheological aspects. Mechanical Properties at hardened state. Long term properties such as creep and shrinkage.

Durability, rebar corrosion etc. Modern concrete such as high performance concrete, RPC, FRC, SCC etc.

COURSE DETAIL

SL. No.	Topic	No. of hours
1	Cement: <ul style="list-style-type: none"> • Production, composition, and properties; cement chemistry; • Types of cements; special cements. 	3
2	Aggregates: <ul style="list-style-type: none"> • Mineralogy; properties, tests and standards. 	1
3	Chemical and mineral admixtures: <ul style="list-style-type: none"> • Water reducers, air entrainers, set controllers, specialty admixtures - structure properties, and effects on concrete properties. 	6



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Civil Engineering

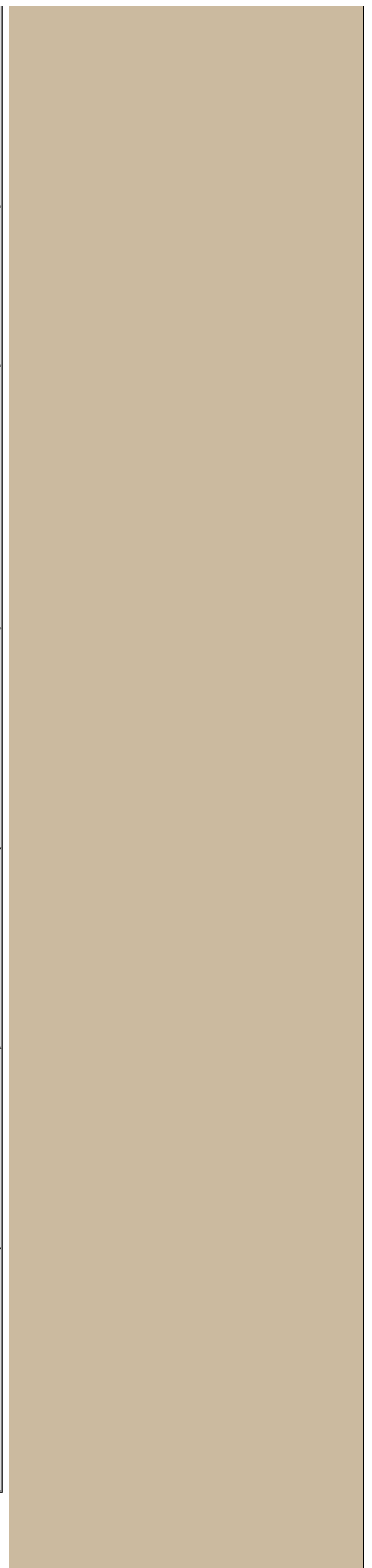
Pre-requisites:

1. Building Materials and Construction.

Coordinators:

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	<ul style="list-style-type: none"> • Introduction to supplementary cementing materials and pozzolans. • Fly ash, blast furnace slag, silica fume, and metakaolin - their production, properties, and effects on concrete properties. • Other mineral additives - reactive and inert. 	
4	Concrete mix design: <ul style="list-style-type: none"> • Basic principles; IS method; ACI method; new approaches based on rheology and particle packing. 	4
5	Concrete Production & Fresh concrete: <ul style="list-style-type: none"> • Batching of ingredients; mixing, transport, and placement. • Consolidation, finishing, and curing of concrete; initial and final set - significance and measurement. • Workability of concrete and its measurement. 	8
6	Engineering properties of concrete: <ul style="list-style-type: none"> • Compressive strength and parameters affecting it. • Tensile strength - direct and indirect; Modulus of elasticity and Poisson's ratio. • Stress strain response of concrete. 	4
7	Dimensional stability and durability: <ul style="list-style-type: none"> • Creep and relaxation - parameters affecting; Shrinkage of concrete - types and significance. • Parameters affecting shrinkage; measurement of creep and shrinkage. 	4
8	Durability of concrete: <ul style="list-style-type: none"> • Introduction to durability; relation between durability and permeability. • Chemical attack of concrete; corrosion of steel rebars; other durability issues. 	6
9	Special concretes: <ul style="list-style-type: none"> • Properties and applications of: High strength - high performance concrete, reactive powder concrete. • Lightweight, heavyweight, and mass concrete; fibre reinforced concrete; self-compacting concrete; shotcrete; other special concretes. 	6



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20. Hannant, D.J., "FIBRE CEMENTS AND FIBRE CONCRETE".
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