

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
*(Formerly West Bengal University of Technology)*

<b>CE(PC)404</b>	<b>Concrete Technology</b>	<b>2L + 1T</b>	<b>3 Credits</b>
<b>Course Outcome</b>	On completion of the course, the students will be able to: 1. test all the required properties of concrete materials as per IS code. 2. compute the properties of concrete at fresh and hardened state. 3. design the concrete mix as per latest IS code methods. 4. ensure quality control while testing/ sampling. 5. Design the special type of concrete for specific application purposes. 6. Use the admixture as per requirement.		
<b>Prerequisite</b>	Introduction to Civil Engineering CE(HS)302, Chemistry BS-CH101.		

**Maulana Abul Kalam Azad University of Technology, West Bengal**

*(Formerly West Bengal University of Technology)*

**Syllabus for B. Tech in Civil Engineering**

**(Applicable from the academic session 2018-2019)**

<b>Module 1</b>	<b>Cement:</b> Manufacturing of cement, Oxides composition of cement and the calculation of compounds, Heat of hydration, Types of cement-OPC, RPC. Low heat cement, PPC, PSC, Sulphate resisting cement, High Alumina cement, Expansive cement, White cement; Test on cement- fineness, consistency, initial setting time & final setting time, soundness test, strength test, specific gravity of cement, storage of cement.	5L + 3T	
<b>Module 2</b>	<b>Aggregates:</b> Classification, Grading, alkali-aggregate reaction, deleterious substances in aggregates, physical properties, testing of aggregates- fineness modulus, bulking, specific gravity, sieve analysis, flakiness & elongation index. Quality of Water for mixing and curing - use of sea water for mixing concrete.	3L + 1T	
<b>Module 3:</b>	<b>Properties of fresh concrete:</b> Workability, factors affecting workability, segregation and bleeding, tests on workability- slump test, compacting factor test, vee-bee test, flow table test.	3L + 1T	
<b>Module 4:</b>	<b>Properties of Hardened concrete:</b> Tensile & compressive strength, flexural strength, stress-strain characteristics, modulus of elasticity, poisson's ratio, Creep, shrinkage, permeability of concrete, micro cracking of concrete.	3L + 1T	
<b>Module 5:</b>	<b>Strength of concrete:</b> curing methods, water-cement ratio, gel-space ratio, maturity of concrete,	3L + 1T	
<b>Module 6</b>	<b>Admixtures:</b> types, uses, superplasticizers, plasticizers, Bonding admixtures.	2L + 1T	
<b>Module 7</b>	<b>Mix Design</b> – Objective, factors influencing mix proportion - Mix design by I.S. 10262-2019. (with & without admixture)	3L + 1T	
<b>Module 8</b>	<b>Non-destructive test:</b> Rebound hammer and Ultra-sonic pulse velocity testing methods. Quality control - Sampling and testing, Acceptance criteria.	3L + 1T	
<b>Module 9</b>	<b>Special Concrete</b> – Ferrocement - Fibre reinforced concrete - Polymer concrete - Sulphur Concrete - Self compacting concrete. Ready mix concrete, Batching plant.	4L + 1T	
<b>Reference</b>	<b>Sl.</b> <b>Book Name</b>	<b>Author</b>	<b>Publishing House</b>
	1   Concrete Technology (Theory & Practice)	Shetty, M.S.	S. Chand and Co.
	2   Concrete Technology	Gambhir, M.L.	Tata McGraw Hill
	3   Concrete Technology	A. M. Neville and J.J. Brooks	Pearson Education India Ltd.
	4   Properties of Concrete	A.M.Neville	Pearson India