

Discipline : Civil Engg	Semester: 3rd	Name of the Teaching Faculty:DIPTI PANIGRAHI
Subject:BUILDING MATERIAL & CONCRETE TECHNOLOGY	No. of Days/Per week class allotted: 03	Semester From Date: 01.07.2026 To Date: 05.11.2026
		No. of Weeks: 18 Weeks
WEEK	Class Days	TOPIC TO BE COVERED
1ST	1st	Overview of Construction Materials (2HR) Scope of construction materials in Building Construction, Transportation Engineering, Environmental Engineering, and Irrigation Engineering
	2nd	Selection of materials for different civil engineering structures on the basis of strength, durability, Eco friendly and economy
	3rd	Broad classification of materials –, Natural, Artificial, special, finishing and recycled
2ND	1st	Natural Construction Materials-(5HR) Requirements of good building stone; general characteristics of stone; quarrying and dressing methods and tools for stone.
	2nd	different methods of seasoning for preservation of timber, defects in timber
	3rd	use of bamboo in construction. □ Asphalt, bitumen and tar used in construction, properties and uses.
3RD	1st	Properties of lime, its types and uses. □ Types of soil and its suitability in construction
	2nd	Properties of sand and uses Classification of coarse aggregate according to size
	3rd	Artificial Construction Materials (5HR) Constituents of brick earth, Conventional / Traditional bricks, Modular and Standard bricks, Special bricks –fly ash bricks, Characteristics of good brick, Field tests on Bricks
4TH	1st	Classification of burnt clay bricks and their suitability, Manufacturing process of burnt clay brick, fly ash bricks, Aerated concrete blocks Flooring tiles – Types, uses Pre-cast concrete blocks- hollow, solid, pavement blocks, and their uses.
	2nd	Plywood, particle board, Veneers, laminated board and their uses.
	3rd	Types of glass: soda lime glass, lead glass and borosilicate glass and their uses. Ferrous and non-ferrous metals and their uses.
5TH	1st	Cement Manufacturing process of Cement – dry and wet (only flow chart),
	2nd	types of cement and its uses. Field tests on cement.
	3rd	Physical properties of OPC and PPC: fineness, standard consistency, setting time, soundness, compressive strength. Different grades of OPC and relevant BIS codes

6TH	1st	Testing of cement: Laboratory tests-fineness, standard consistency, setting time, soundness, compressive strength. Storage of cement and effect of storage on properties of cement.
	2nd	BIS Specifications and field applications of different types of cements: Rapid hardening, Lowheat, Portland pozzolana, Sulphate resisting, Blast furnace slag, High Alumina and White cement.
	3rd	Aggregates: Requirements of good aggregate, Classification according to size and shape Fine aggregates:
7TH	1st	Properties, size, specific gravity, bulk density, water absorption and bulking, fineness modulus and grading zone of sand, silt content and their specification as per IS 383. Concept of crushed Sand.
	2nd	Coarse aggregates: Properties, size, shape, surface texture, water absorption,
	3rd	soundness, specific gravity and bulk density, fineness modulus of coarse aggregate, grading of coarse aggregates, crushing value
8TH	1st	impact value and abrasion value of coarse aggregates with specifications. Water: Quality of water, impurities in mixing water and permissible limits for solids as per IS: 456.
	2nd	Admixtures in concrete: Purpose, properties and application for different types of admixtures such
	3rd	admixtures, air entraining admixtures and super plasticizers. (concepts only)
9TH	1st	Concrete (8HR) Concrete: Different grades of concrete, provisions of IS 456 (Latest). Duff Abraham water cement (w/c) ratio law, significance of w/c ratio, selection of w/c ratio for different grades
	2nd	Properties of fresh concrete: Workability: Factors affecting workability of concrete
	3rd	Determination of workability of concrete by slump cone, compaction factor, Vee-Bee Consistometer
10TH	1st	Value of workability requirement for different types of concrete works.
	2nd	Segregation, bleeding and preventive measures.
	3rd	Value of workability requirement for different types of concrete works
11TH	1st	Segregation, bleeding and preventive measures. Properties of Hardened concrete: Strength, Durability, Impermeability.
	2nd	Concrete Mix Design and Testing of Concrete (5hHR) Concrete mix design
	3rd	Objectives, methods of mix design, study of mix design as per IS 10262 (only procedural steps).
12TH	1st	Non- destructive testing of concrete: Rebound hammer test, working principle of rebound hammer
	2nd	factor affecting the rebound index
	3rd	Ultrasonic pulse velocity test as per IS13311 (part 1 and 2),
13TH	1st	Importance of NDT tests.
	2nd	Mixing, Transportation
	3rd	Placing, Compaction, Curing and Finishing of concrete.

14TH	1st	Forms for concreting: Different types of form works for beams, slabs, columns, materials used for form work, requirement of good form work.
14TH	2nd	Waterproofing: Importance and need of waterproofing, methods of waterproofing and materials used for waterproofing.
	3rd	Joints in concrete construction: Types of joints, methods for joining old and new concrete
15TH	1st	materials used for filling joints.
	2nd	Special Concrete and Extreme Weather concreting (5HR) Special Concrete: Properties
	3rd	advantages and limitation of following types of Special concrete
16TH	1st	Ready mix Concrete, Fiber Reinforced Concrete, High performance Concrete, Selfcompacting concrete and light weight concrete.
	2nd	DO-
	3rd	Cold weather concreting: effect of cold weather on concrete
17TH	1st	precautions to be taken while concreting in cold weather condition. (only concepts)
	2nd	DO
	3rd	Hot weather concreting: effect of hot weather on concrete
18TH	1st	DO
	2nd	precautions to be taken while concreting in hot weather condition. (only concepts)
	3rd	DO

Deepti Panigrahi
Signature of Faculty: 20.7.2026


20/07/26
Signature of HOD