LESSON PLAN OF **CEPC209 TH:5 Building Material & Concrete Technology** FOR THE SESSION 2025-26(WINTER 2025)BATCH-2024-27,GOVT.POLYTECHNIC,KANDHAMAL

Discipline: **civil engineering**	Semester: **3rd**	Name of the Teaching Faculty: **Rahul Kumar Rout,Lect. Stage I in Cvil Engg.**
Subject: **CEPC209 TH:5BuildingMaterial & Concrete Technology**	No. of days/ per week class allotted: **3**	Semester From Date : **14/07/2025** to Date: 15/11/2025 No. of Weeks: **15**

Week	Class Day	Theory/ Practical Topics (as per Blooms Taxonomy)
1st	1st	Scope of construction materials in Building Construction, Transportation Engineering, Environmental Engineering, and Irrigation Engineering (applications only)
	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-Requirements of good building stone; general characteristics of stone; quarrying anddressing methods
	2nd	Structure of timber, general properties and uses of good timber, different methods of seasoning for preservation of timber, defects in timber, use of bamboo in construction
	3rd	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	Constituents of brick earth, Conventional / Traditional bricks, Modular and Standard bricks, Special bricks –fly ash bricks, Characteristics of good brick, Field tests on Bricks, Classification of burnt clay bricks and their suitability, Manufacturing process of burnt clay brick, fly ash bricks, Aerated concrete blocks
4th	1st	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.Types of glass: soda lime glass, lead glass and borosilicate glass and their uses
	3rd	Ferrous and non-ferrous metals and their uses.Composition of Cement.Manufacturing process of Cement – dry and wet (only flow chart), types of cement and its uses. Field tests on cement.
5th	1st	Physical properties of OPC and PPC: fineness, standard consistency, setting time, soundness, compressive strength. Different
	2nd	Testing of cement: Laboratory tests-fineness, standard consistency, setting time, soundness, compressive strength. Storage of
	3rd	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.
6th	1st	Aggregates: Requirements of good aggregate, Classification according to size and shape.Fine aggregates: 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, soundness, specific gravity and bulk d. sity, fineness modulus of coarse aggregate, grading of coarse aggregates, crushing value, impact value and abrasion value of coarse aggregates with specifications.
	3rd	Water: Quality of water, impurities in mixing water and permissible limits for solids as per IS: 456.Admixtures in concrete: Purpose, properties and application for different types of admixturesuch as accelerating admixtures, retarding admixtur water reducing admixtures, air entraining admixtures and super plasticizers. (concepts only)
7th	1st	Concrete: Different grades of concrete, provisions of IS 456 (Latest).
	2nd	Duff Abraham water cement (w/c) ratio law, significance of w/c ratio, selection of w/c ratio for different grades, maximum w/c ratio for different grades of concrete for different expo- sure conditions as per IS 456.
	3rd	Properties of fresh concrete: Workability: Factors affecting workability of concrete. Determination of workability of concrete by slump cone, compaction factor, Vee-Bee Consistometer. Value of workability requirement for different types of concrete works. Segregation, bleeding and preventive measures.
8th	1st	Properties of Hardened concrete: Strength, Durability, Impermeability.
	2nd	Concrete mix design: Objectives, methods of mix design, study of mix design as per IS 10262 (only procedural steps).

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	3rd	Non- destructive testing of concrete: Rebound hammer test, working principle of rebound hammer and factor affecting the rebound index, Ultrasonic pulse velocity test as per IS13311 (part 1 and 2), Importance of NDT tests.
9th	1st	Concreting Operations: Batching, Mixing, Transportation, Placing, Compaction, Curing and Finishing of concrete.
	2nd	Forms for concreting: Different types of form works for beams, slabs, columns, materials used for form work, requirement of good form work. Stripping time for removal of form works perIS 456.
	3rd	Waterproofing: Importance and need of waterproofing.
10th	1st	methods of waterproofing
	2nd	materials used for waterproofing.
	3rd	Joints in concrete construction: Types of joints
11th	1st	methods for joining old concrete
	2nd	methods of joining new concrete
	3rd	materials used for filling joints.
12th	1st	Special Concrete: Properties, advantages and limitation of following types of Special concrete: Ready mix Concrete,
	2nd	Special Concrete: Properties, advantages and limitation of following types of Special concrete: , Fiber Reinforced Concrete,
	3rd	Special Concrete: Properties, advantages and limitation of following types of Special concrete: High performance Concrete,
13th	1st	Special Concrete: Properties, advantages and limitation of following types of Special concrete: Self- com pacting concre
	2nd	Special Concrete: Properties, advantages and limitation of following types of Special concrete: light weight concrete.
	3rd	Cold weather concreting: effect of cold weather on concrete.
14th	1st	precautions to be taken while concreting in cold weather condition. (only concepts)
	2nd	Hot weather concreting: effect of hot weather on concrete,
	3rd	precautions to be taken while concreting in hot weather condition. (only concepts)
15th	1st	Revision
	2nd	Previous year questions
	3rd	class Test.

14/07/2025

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