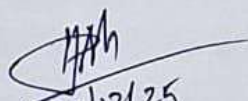


Discipline: CIVIL	Semester: 4th	Name of Teaching Faculty: Sri Prakash Chandra Murmu
Subject: PRECAST & PRESTRESSED CONCRETE	No of Days/Week Class allotted:- 03	Semester from date: 22.12.2025 to 18.04.2026 No of Weeks: 15
Week	Class Day	Theory Topics
1st	1st	1. Precast concrete Elements: Advantages and disadvantages of precast concrete members
	2nd	Non-structural Precast elements - Paver blocks, Fencing Poles, Transmission Poles
	3rd	Manhole Covers, Hollow and Solid Blocks, kerb stones as per relevant BIS specifications
2nd	1st	Structural Precast elements – tunnel linings, Canal lining, Box culvert, bridge panels, foundation, sheet piles
	2nd	Testing of Precast components as per BIS standards
	3rd	2. Prefabricated building: Precast Structural Building components such as slab panels, beams
3rd	1st	columns, footings, walls, lintels and chajjas, staircase elements
	2nd	Prefabricated building using precast load bearing and non-load bearing wall panels, floor systems - Material characteristics, Plans & Standard specifications
	3rd	Prefabricated building using precast load bearing and non-load bearing wall panels, floor systems - Material characteristics, Plans & Standard specifications
4th	1st	Modular co-ordination, modular grid, and finishes
	2nd	Modular co-ordination, modular grid, and finishes
	3rd	Prefab systems and structural schemes and their classification including design considerations
5th	1st	Prefab systems and structural schemes and their classification including design considerations
	2nd	Joints – requirements of structural joints and their design considerations
	3rd	Joints – requirements of structural joints and their design considerations
6th	1st	Manufacturing, storage, curing, transportation and erection of above elements, equipment needed
	2nd	Manufacturing, storage, curing, transportation and erection of above elements, equipment needed
	3rd	3. Introduction to Prestressed Concrete : Principles of pre-stressed concrete and basic terminology
7th	1st	Principles of pre-stressed concrete and basic terminology
	2nd	Applications, advantages and disadvantages of prestressed concrete
	3rd	Materials used and their properties, Necessity of high- grade materials
8th	1st	Materials used and their properties, Necessity of high- grade materials
	2nd	Types of Pre-stressing steel -Wire, Cable, tendon, Merits-demerits and applications
	3rd	Types of Pre-stressing steel -Wire, Cable, tendon, Merits-demerits and applications
	1st	4. Methods and systems of prestressing: Methods of prestressing – Internal and External pre-stressing, Pre and Post tensioning- applications

9th	2nd	Systems for pre tensioning – process, applications, merits and demerits - Hoyer system
	3rd	Systems for post-tensioning - process, applications, merits and demerits - Freyssinet system, Magnel Blaton system, Gifford Udall system.
10th	1st	Prestressing force in Cable, Loss of prestress during the tensioning process - loss due to
	2nd	Simple Numerical problems to determine loss of pre-stress
	3rd	Simple Numerical problems to determine loss of pre-stress
11th	1st	Loss of pre- stress at the anchoring stage
	2nd	Loss of pre-stress occurring subsequently: losses due to shrinkage of concrete, creep of
	3rd	Simple Numerical problems to determine loss of pre-stress
12th	1st	Simple Numerical problems to determine loss of pre-stress
	2nd	BIS recommendations for percentage loss in case of Pre and Post tensioning
	3rd	5. Analysis and design of Prestressed rectangular beam section: Basic assumptions in analysis of pre-stressed concrete beams
13th	1st	Cable Profile in simply supported rectangular beam section – concentric, eccentric straight and parabolic
	2nd	Effect of cable profile on maximum stresses at mid span and at support
	3rd	Numerical problems on determination of maximum stresses at mid spans with linear (concentric and eccentric) cable profiles only.
14th	1st	Numerical problems on determination of maximum stresses at mid spans with linear (concentric and eccentric) cable profiles only.
	2nd	Numerical problems on determination of maximum stresses at mid spans with linear (concentric and eccentric) cable profiles only.
	3rd	Numerical problems on determination of maximum stresses at mid spans with linear (concentric and eccentric) cable profiles only.
15th	1st	Simple steps involved in Design of simply supported rectangular beam section (No numerical problems)
	2nd	Simple steps involved in Design of simply supported rectangular beam section (No numerical problems)
	3rd	Simple steps involved in Design of simply supported rectangular beam section (No numerical problems)


 20/12/25