Discipline : Civil engg	Semester: 4th	Name of the Teaching Faculty : Padma Lochan Behera, Sr. Lect. (Civil)	
Subject: THEORY OF STRUCTURE	No. of Days / Week class allotted: 3	Semester Duration: 22/12/2025 to 18/04/2026 No. of Weeks :17	
Week	**Class day**	**Theory/Practical Topics:**	
1st	1st	**Direct and Bending Stresses in vertical members:** Introduction to axial and eccentric loads, eccentricity about one principal axis only, nature of stresses	
	2nd	Maximum and minimum stresses, resultant stresses and distribution diagram. Condition for no tension or zero stress at extreme fiber	
	3rd	Numericals	
2nd	1st	Limit of eccentricity, core of section for rectangular and circular cross sections, Middle third rule.	
	2nd	Chimneys of circular cross section subjected to wind pressure, Maximum and minimum stresses, resultant stresses and distribution diagram at base.	
	3rd	Numericals	
3rd	1st	Analysis of dams subjected to horizontal water pressure, conditions of stability, Maximum and minimum stresses, resultant stresses and distribution diagram at base.	
	2nd	Numericals	
	3rd	**Slope and Deflection:** Concept of slope and deflection, stiffness of beams, Relation among bending moment, slope, deflection and radius of curvature, (no derivation).	
4th	1st	Double integration method to find slope and deflection of cantilever Beam	
	2nd	Numericals	
	3rd	Double integration method to find slope and deflection of Simply Supported Beam	
5th	1st	Numericals	
	2nd	Macaulay's method for slope and deflection, application to cantilever Beam	
	3rd	Numericals	
6th	1st	Macaulay's method for slope and deflection, application to Simply Supported Beam	
	2nd	Numericals	
	3rd	**Determinate and Indeterminate structures (Fixed and Continuous Beam) :** Concept of Determinate and Indeterminate structures. Concept of fixity, effect of fixity, advantages and disadvantages of fixed beam over simply- supported beam.	
7th	1st	Principle of superposition, Fixed end moments from first principle for beam subjected to point load, UDL over entire span.	
	2nd	Application of standard formulae in finding end moments, end reactions and drawing S.F. and B.M. diagrams for a fixed beam.	
	3rd	Numericals	
8th	1st	Definition, effect of continuity, nature of moments induced due to continuity, concept of deflected shape, practical examples.	
	2nd	Numericals	
	3rd	Clapeyron's theorem of three moment (no derivation), Application of Clapeyron's theorem maximum up to three spans and two unknown	

			support moment only, Support at same level spans having same and uniform moment of inertia subjected to concentrated loads
9th		1st	Numericals
		2nd	Clapeyron's theorem of three moment (no derivation), Application of Clapeyron's theorem maximum up to three spans and two unknown support moment only, Support at same level spans having same and uniform moment of inertia subjected to uniformly distributed loads over entire span
		3rd	Numericals
10th		1st	Concept of influence line diagram (ILD)
		2nd	**Moment distribution method:** Introduction to moment distribution method, sign convention, Carry over factor, stiffness factor, distribution factor.
		3rd	Application of moment distribution method to various types of continuous beams subjected to concentrated loads having same or different moment of inertia, supports at same level, up to three spans and two unknown support moments only.
11th		1st	Numericals
		2nd	Application of moment distribution method to various types of continuous beams subjected to uniformly distributed loads having same or different moment of inertia, supports at same level, up to three spans and two unknown support moments only.
		3rd	Numericals
12th		1st	Numericals
		2nd	Introduction to portal frames – Symmetrical and unsymmetrical portal frames with the concept of Bays and stories.
		3rd	Numericals
13th		1st	Numericals
		2nd	**Simple trusses:** Types of trusses (Simple, Fink, compound fink, French truss, pratt truss, Howe truss, North light truss, King post and Queen post truss)
		3rd	Calculate support reactions for trusses subjected to point loads at joints
14th		1st	Numericals
		2nd	Calculate forces in members of truss using Method of joints
		3rd	Numericals
15th		1st	Numericals
		2nd	Calculate forces in members of truss using Method of Section
		3rd	Numericals
16th		1st	Numericals
		2nd	Revision
		3rd	Revision
17th		1st	Question Bank Discussion
		2nd	Question Bank Discussion
		3rd	Question Bank Discussion

Prepared By :

Padmalochan Behera

Approved By:

22/12/25

HOD(Civil)