4023-THEORY OF STRUCTURES (ANALYSIS) –II

Teaching Schedule Per Week			Progressive Assessment		Examination Schedule (Marks)			
Lectures	Practical	Credits			Theory		Practical Ex	Total
3	0	3	25		3Hrs.	100	0	125

Pre-requisite	Source
4022	CVL

Semester	Theory	Test	Total	TW	PR	Gr Total
	75	25	100	—	—	100

RATIONALE: - This course is continuation of Theory of Structures-I, the topics included are of relatively advanced in nature to enable the student to analyse the given structure, developing cognitive abilities and skills of high level.

COURSE CONTENTS	Hrs	Mks
1. SLOPE AND DEFLECTION	10	22
Formulation of differential equations of elastic line for a beam subjected to bending. Derivation of formula for slopes and deflections for standard cases- Macaulay's Method, Moment- Area- Methods, (Mohr's Theorems) [Note: Cubic eqns. are not to be considered in Macaulay's Method]. Propped cantilevers, only basic concepts, simple problems, prop-reaction, B.M.D. and S.F.D.		
2. FIXED BEAMS OF UNIFORM SECTIONS	10	22
Determination of fixed and moments for the beams carrying point loads and U.D.L. on full and part span. Construction of shear force and bending moment diagrams.		

3. MOMENT DISTRIBUTION METHOD Definition. Stiffness, relative stiffness distribution factor, carry over factor. Sign conventions. Analysis of continuous beam uniform section, supports @ the same level and carrying point-load and U.D.L over entire spans. Analysis of single storied single span portal frame carrying point load or U.D.L over entire span (only non-sway analysis).	12 8	24 16
4. COLUMNS Types of columns, definition, short and long columns. Buckling of long columns under axial loading. Euler's formula for crippling-load (derivation not needed). End- conditions, effective length, slenderness ratio. Limitations of Euler's formula. Rankine's formula. Column formula as per I. S. 800-1984.	8	16
5.THREE HINGED ARCHES Three hinged arches. Beam moment and horizontal moment. Horizontal thrust. Types of arches- Circular and parabolic arches with supports at same level and at different levels subjected to concentrated loads, uniformly distributed load throughout and partial uniformly distributed load. Problems on analysis of arches with supports at same and at different levels.	8	16
Total	48	100

REFERENCE BOOKS

1. Strength of materials by B.B. Lord.
2. Mechanics of materials by E.S. Herman.
3. Mechanics of Structure Vol. I by S.B. Junnarkar.
4. Strength of Materials by P.V. Warnock.
5. Theory of structures by Smith.
6. Strength of Materials by S. Timoshenko
7. Theory of structure by S. Timoshenko and Young.
8. Theory of structures by S. Ramanruham.
9. Theory and analysis of structures by O.P. Jain and B. K. Jain.