Course Number and Name

BCE501 - STRUCTURAL ANALYSIS – I

Credits and Contact Hours

4 & 60

Course Coordinator's Name

Dr.S.J.Mohan

Text Books and References

TEXT BOOK:

1. Vaidyanadhan, R and Perumal, P, "Comprehensive Structural Analysis – Vol. 1 & Vol. 2",Laxmi Publications, New Delhi, 2003.

REFERENCE:

1. Bhavai Katti, S.S, Structural Analysis – Vol. 1 & Vol. 2, Vikas Publishing Pvt Ltd., New Delhi,2008
2. Analysis of Indeterminate Structures – C.K. Wang, Tata McGraw-Hill, 1992.
3. Negi L.S. Jangid & R.S., "Structural Analysis", Tata McGraw-Hill Publications, New Delhi, Sixth Edition, 2003.

Course Description

- To introduce the students to basic theory and concepts of structural analysis and the classical methods for the analysis of structures.

Prerequisites	Co-requisites
Basic Structural Design	NIL

required, elective, or selected elective (as per Table 5-1)

Course Outcomes (COs)

CO1	Analyze the pin jointed plane frames using energy and consistent deformation method
CO2	Analyze indeterminate structures using various classical methods.
CO3	Determine absolute maximum bending moment and shear force in beams due to moving loads.
CO4	Find the maximum moment, shear and stresses produced in arches due to external loads temperature effects and support settlements.
CO5	To find the influence line diagram for determinate structures.

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1	M		M	H							
CO2	M		M	H					L		
CO3	M		M	H						L	
CO4	M		M	H					L		

	CO5	M		M	H						L		

List of Topics Covered

UNIT I INDETERMINATE ANALYSIS 12

Indeterminate Structures: Introduction to static and kinematic Indeterminacy- two and three dimensional pin jointed and rigid jointed structures-space trusses-Energy method-application to indeterminate pin jointed trusses-temperature effect-beams curved in plan.

UNIT II SLOPE DEFLECTION METHOD 12

Slope deflection method: Analysis of continuous beams and portal frames with single storey.

UNIT III MOMENT DISTRIBUTION METHOD 12

Moment distribution method: Stiffness and distribution factors-carry over factor-analysis of continuous beams -single storied portal frames.

UNIT IV ROLLING LOADS 12

Rolling loads: Single concentrated loads - two concentrated loads-uniformly distributed loads-curves of maximum SFD and BMD – equivalent. UDL

UNIT V INFLUENCE LINE DIAGRAMS 12

Influence line for statically determinate beams for bending moment and shear force- absolute maximum BM-concentrated and UDL-Influence line for forces in members for statically determinate truss parallel chord truss.