Course Number and Name

BCE069 - MATRIX METHODS AND STRUCTURAL ANALYSIS

Credits and Contact Hours

3 & 45

Course Coordinator's Name

Mr.K.Sathishkumar

Text Books and References

TEXT BOOKS:

- L.S. Negi & R.S. Jangid, "Structural Analysis", Tata McGraw-Hill Publications, New Delhi,2003.

REFERENCES:

- BhaviKatti, S.S, "Structural Analysis – Vol. 1 Vol. 2", Vikas Publishing House Pvt. Ltd., New Delhi, 2008
- William Weaver,"Computer Programs for Structural Analysis",Van Nostrand,1967)
- Rubinstein M.E, "Matrix Computer Analysis of Structures", Prentice Hall, 1969.

Course Description

- To introduce the students to advanced methods of analysis like matrix methods, structural analysis stiffness method, Flexibility method and also analysis of space structures

Prerequisites	Co-requisites
Structural analysis-II	NIL

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

Course Outcomes (COs)

CO1	Apply the basic concepts of matrix methods in structural Analysis
CO2	Find out the deflections in beams and trusses using various methods
CO3	Analyze the structures using flexibility and stiffness method
CO4	Determine member forces using element and system matrices for determinate and indeterminate structures
CO5	Determine the forces in various members due to lack of fit and thermal expansion.

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	H						
CO2	M		M	H							
CO3	M		M	H							
CO4	M		M	H							
CO5	M		M	H							

List of Topics Covered

UNIT I ANALYSIS OF INDETERMINATE STRUCTURES 9

Concept of Indeterminate Structural Analysis –Indeterminacy - flexibility method stiffness method – choice of method.

UNIT II STIFFNESS METHOD 9

Stiffness Method: Three dimensional structures – space trusses – grid structures – rigid frame structures.

UNIT III ANALYSIS OF SUBSTRUCTURE 9

Analysis of Structural system using substructure: Basic concepts – analysis of substructure – simple examples.

UNIT IV FLEXIBILITY METHOD 9

Flexibility method: Trusses, beams and space frames.

UNIT V COMPUTER APPLICATIONS 9

Preparation of Computer Programmes: Trusses – beam – space frames