

COURSE CODE: 1153EE106	COURSE TITLE: <b>FINITE ELEMENT ANALYSIS</b>	L	T	P	C
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**COURSE CATEGORY:**

Allied Elective

**PREAMBLE :**

To study the basic concept of discrete and continuous element analysis

**PREREQUISITE COURSES:**

- Mathematics for Electrical Engineers

**COURSE EDUCATIONAL OBJECTIVES:**

The objectives of the course are to make the students,

- To introduce the concept of numerical analysis of structural components

**COURSE OUTCOMES :**

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Understand the criteria of finite element method	K2
CO2	Explain about the basics of discrete elements	K2
CO3	Describe about the continuum elements	K2
CO4	Explain about the applications of isoperimetric elements	K2
CO5	Understand the applications to other field problems	K2

**CORRELATION OF COs AND POS**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	M						L					
CO2			H		H	L				H		
CO3	L	H	H				H		H			
CO4	L	L			M	M		M				
CO5	M		H		H							

**COURSE CONTENT:**

<b>UNIT I</b>	<b>INTRODUCTION</b>	<b>9</b>
Review of basic analysis – Stiffness and Flexibility matrix for simple cases – Governing equation and convergence criteria of finite element method.		
<b>UNIT II</b>	<b>DISCRETE ELEMENTS</b>	<b>9</b>
Bar, Frame, beam elements – Application to static, dynamic and stability analysis.		
<b>UNIT III</b>	<b>CONTINUUM ELEMENTS</b>	<b>9</b>
Various types of 2-D-elements Application to plane stress, plane strain and axisymmetric problems		
<b>UNIT IV</b>	<b>ISOPARAMETRIC ELEMENTS</b>	<b>9</b>
Applications to two and three-dimensional problems		

<b>UNIT V</b>	<b>FIELD PROBLEM</b>	<b>9</b>
Applications to other field problems like heat transfer and fluid flow.		
<b>TOTAL: 45 PERIODS</b>		
<b>TEXT BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Tirupathi.R. Chandrapatha and Ashok D. Belegundu, "Introduction to Finite Elements in Engineering", Prentice Hall India, Third Edition, 2003.</li> <li>2. Introuciton to finite elements in engineering tirupathi, R., chandrupatel ashok.D</li> <li>3. An introduction to finite Element Method J.N. Reddy</li> <li>4. Finite element analysis-Theory and programming C.S. Krishnamurthy,</li> <li>5. The finite Element Method in Engineering S.S.Rao.</li> </ol>		
<b>REFERENCE BOOKS:</b>		
<ol style="list-style-type: none"> <li>1. Reddy J.N. "An Introduction to Finite Element Method", McGraw-Hill, 2000.</li> <li>2. Krishnamurthy, C.S., "Finite Element Analysis", Tata McGraw-Hill, 2000.</li> <li>3. Bathe, K.J. and Wilson, E.L., "Numerical Methods in Finite Elements Analysis", Prentice Hall of India, 1985.</li> </ol>		