

**INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI**  
**PROFORMA FOR NEW COURSE**

1.	Title of the Course	Finite Element Method in Engineering Mechanics
2.	Course Number	ME5102
3.	Status of the Course	Elective
4.	Structure of Credits	3-0-0-3
5.	Offered to	PG
6.	New Course/ Modification to existing course	New Course
7.	To be offered by	Dr. N. N. Kishore
8.	To take effect from	January 2018
9.	Prerequisite	Strength of Materials
10.	Whether approved by the Program	Yes
11.	<p>Course Objective:</p> <ul style="list-style-type: none"> <li>• To equip the students with the basics of Finite Element Analysis.</li> <li>• To enable the students to formulate the design problems in a general 2-D and 3-Dimensions.</li> <li>• To introduce basic physical and mathematical aspects of finite element technology for general field problems, heat transfer, fluid mechanics problems etc.</li> <li>• To emphasize the numerical aspects of polynomial interpolation, domain discretization, and solution of the resulting algebraic systems.</li> </ul>	
12.	<p>Course Content:</p> <p>Introduction to one-dimensional Finite Element Method. Problems in structural mechanics using two dimensional elements; Plane stress, plane strain, axi-symmetric analysis; Three dimensional stress analysis; Shell analysis; Details of element formulations, numerical implantations, convergence aspects. Solution of heat conduction, fluid flow, vibration, stability, and nonlinear, large scale systems.</p>	
13.	<p>Text Book:</p> <ol style="list-style-type: none"> <li>1. D. V. Hutton, "Fundamentals of Finite Element Analysis", Tata McGraw Hill, 2003</li> <li>2. O.C Zienkiewicz and K. Morgon, "Finite Elements and Approximation", Dover Publ, 2006</li> </ol>	
14.	<p>References:</p> <ol style="list-style-type: none"> <li>1. J. N. Reddy, "An Introduction to Finite Element Method", McGraw Hill , 3<sup>rd</sup> Ed, 2005</li> <li>2. O.C Zienkiewicz and R.L. Taylor, "The Finite Element Method", Vol 1 &amp; 2; 5<sup>th</sup> Ed, Butterworth-Heinemann, 2000</li> <li>3. R.D. Cook, D.S. Malcus and Plesha, "Concepts and Applications of Finite Element Analysis", 4<sup>th</sup> Ed, Wiley, 1997</li> <li>4. K.J. Bathe, Finite Element Procures, 2<sup>nd</sup> Ed, Prentice Hall, 1995</li> <li>5. Daryl Logan, A First Course in Finite Element Method, Thomson, India Edition, 5<sup>th</sup> Ed, 2011</li> </ol>	