

Concepts & Applications of the Finite Element Method

From 2nd Sep till 7th Sep 2019

Over View:

The curriculum for workshop consists of three modules i.e. Concepts of FEM, Composite Research, and Applications of FEM, the major focus is on the writing the basic fem code in MATLAB, using commercial FEM software ABAQUS (standard and Explicit) to solve problems, and how to make use of experiments to validate the results obtained from FEM. Lectures be delivered by various experts in IIT Hyderabad.

Modules:

The course is divided in to three modules.

In module **A: “Concepts of FEM”** consists of

1. Introduction to FEM
2. Approximate methods in FEM
3. 1D FEM of Bar and Beam
4. Review of Solid Mechanics and Continuum Mechanics
5. 2D/3D Element Library and Element Formulation
6. Numerical quadrature, Iso-parametric formulation
7. FEM formulation of Elasto-dynamics

In module **B: “Composite research”** consists of

1. Composite Fabrication, Characterization and testing (including NDT)
2. Composite Materials and Mechanics
3. Progressive Damage analysis
4. Cohesive zone modelling
5. Buckling analysis of composites

In module **C: “Applications of FEM”** consists of

1. Stability analysis
2. Rate independent Plasticity
3. Application of FEM in Aerospace Engineering
4. Hyper-elasticity
5. Impact and Blast
6. High strain rate studies
7. MATLAB (1D, 2D, Static, Stability, Elastodynamics, Plasticity, and Hyperelasticity)
8. ABAQUS Software (1D, 2D, Blast, Impact, Explicit, Composites, Buckling)

You Should Attend If....

This course is designed for Engineers, Faculty and Students. For the Engineers, and Faculty from Civil, Mechanical, Aerospace, and Biomechanical, it is a refresher course. For PG students it will in their research projects. For BTech it will be an advanced course to encourage them check out research avenues.

Fees:

For TEQIP Participants its free of cost.

About Speakers:

Dr. M. Ramji is an Associate professor in Department of Mechanical and Aerospace Engineering at IIT Hyderabad. He has completed masters and Ph.D. in Mechanical Engineering from IIT Madras. Dr. M. Ramji's research interest is related to optical methods for engineering analysis, applied finite element analysis, fracture mechanics, mechanics of composites and material characterization.



Dr. Syed Nizamuddin Khaderi is an Assistant professor in Department of Mechanical and Aerospace Engineering at IIT Hyderabad. He obtained PhD from the University of Groningen and Postdoc from University of Cambridge and Institute of High-Performance Computing, Singapore. His research interest is related to computational solid mechanics, impact loading of structures and fluid-structure interaction.



Dr. Gangadharan Raju is an Assistant professor in Department of Mechanical and Aerospace Engineering at IIT Hyderabad. He obtained PhD from IISc Bangalore and Post-doctoral from University of Bristol. His research interest is related to non-destructive testing and evaluation, Structural Health Monitoring, and design of composite structures, applied fem.



Dr. Chintapenta R Viswanath is an Assistant professor in Department of Mechanical and Aerospace Engineering at IIT Hyderabad. He obtained his PhD from Brown University and Post-doctoral from (ABAQUS-DSS) Dassault Simulia System, Providence-RI and IISc Bangalore. His research interest is in computational solid mechanics.



Dr. Chandrika Prakash Vyasarayani is an Associate professor in Department of Mechanical and Aerospace Engineering at IIT Hyderabad. He obtained his PhD and Post-doctoral from University of Department of Systems Design Engineering at the University of Waterloo, Canada. His research interest is in Structural dynamics.

Course Co-ordinator(s)**Dr. Viswanath R Chinthapenta****And****Dr. Gangadharan Raju**Dept. of Mechanical &
Aerospace Engineering,

IIT Hyderabad

Phone No. 040-2301-7098

Email: viswanath@iith.ac.in