Overview

The **Finite Element Method (FEM)** is the most extensively used numerical tool by engineers and scientists to address several real life problems by solving the partial differential equations. These differential equations arise during the analysis of structural integrity of mechanical components subjected to various kinds of loading, heat transfer, and fluid flow. Few examples of these are bullet penetrating an armour plate, crash events of automotive components, thermal cycling of IC ships during their service life.

Several complex engineering problems such as those involving coupled-field interactions, contact stress analysis, and fluid-structure interaction for which obtaining closed form solutions are very difficult and can be solved with modest effort using FEM. The advent of modern experimental techniques have also lead to the validation of the FEM predictions thereby increasing the reliability of FEM. This has also lead to the deveolpment of several commercial finite element softwares which are widely used in the nuclear, defense, marine, and space applications.

Who Should Attend the Course

This course is designed to the faculty participants from TEQIP institutes who involved in teaching the course on finite element method or who intend to offer the course on finite element method in near future. The course also aimed at solving few engineering problems using commercial FE softwares which will be extremely useful for the industry, research professionals and senior PhD students who involved in stress analysis of components using finite element analysis. Overall, this course is intended to provide an excellent exposure on theory and concepts of FEM along with hands on experience on several examples problems using commercial softwares such as ABAQUS/ANSYS as well as some basics of code writing using MATLAB.

The number of participants are limited to ***50*** on first come-first serve basis. Only those candidate who are short listed based on their registration and research profiles will be intimated through e-mails.

About IIT Indore

Indian Institute of Technology Indore, also known as IIT Indore, is located in Madhya Pradesh, India. Started in 2009 with an aim of Inventions and Innovations in research, IIT Indore is an institute of National Importance with a vision to become World Leader in Science and Technology. Recently, IIT Indore ranked 55 by the Times Higher Education World University Ranking.

At IIT Indore, the thematic balance of research culture among faculties and students is based on the fact of "Ideas for life". This is visible through the ongoing national and international collaborative industry sponsored projects. Besides this, IIT Indore also strives to build and deliver the indegenous technology to Defence and Space sector of India as an initiative of Government's *"Aatmnirbhar Bharat"* program.

http://www.iiti.ac.in/

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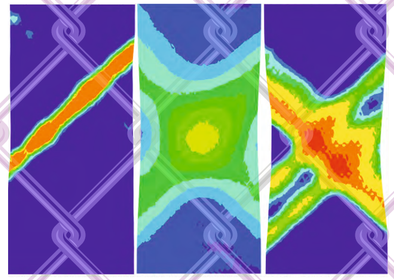
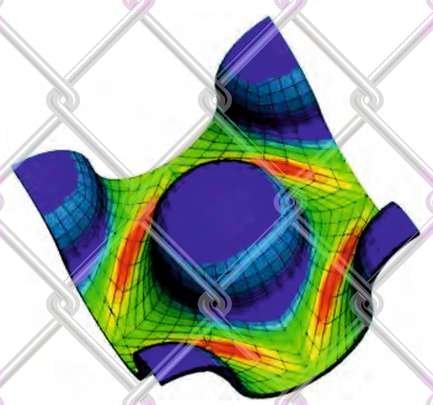
Important Dates:

Registration Deadline: December 01, 2020
Intimation to the participants: December 03, 2020
Link Sharing: December 05, 2020
Online course: December 07-12, 2020
(Time: 1030 to 1700 hours)





Introduction to Finite Element Methods and Applications to Materials Modelling

6 DAYS ONLINE SHORT TERM COURSE

(With Special Applications to Composite Mechanics, Structural Mechanics, High Strain Rate Deformation, Impact Mechanics and MATLAB)

SPONSORED BY: **TEQIP III**

Jointly Organized by

Department of Metallurgy Engineering and Materials Science,
and
Deprtment of Mechanical Engineering
Indian Institute of Technology Indore,
Khandwa Road, Simrol,
Indore 453552 (Madhya Pradesh)

Course Contents

This 6 days course is aimed at providing an overview of finite element analysis with a focus on the following aspects.

- Introduction to FEM and solving 1D Problems
- Formulation methodologies
- Basics of interpolation theory and Iso-parametric formulation
- Application of FEA to materials modelling: A special attention is given solving contact problems, composite structures, deformation, Fatigue and fracture

Tentative Speakers

Prof. Ratna Kumar Annabatulla is an Associate Prof. in the department of Mechanical engineering at IIT Madras. He obtained PhD from the University of Groningen, Netherlands and postdoc from KIT, Germany. His research interest is related to computational mechanics for investigating the stimuli response of thin films and multiphysics modelling with aid of experiments.

Dr. Eswara Prasad Korimilli is an Assistant Prof. in the department of Metallurgy Engg. and Materials Sci. at IIT Indore. He obtained PhD from IISc Bangalore and postdoc from John Hopkins University, US. His research interest are in mechanical behaviour and high strain rate deformation of the materials with both experiments and computation.

Dr. Indrasen Singh is an Assistant Prof. in the department of Mechanical engineering at IIT Indore. He obtained PhD from IISc Bangalore. His research interest are related to computational solid mechanics with special focus on fracture mechanics of bulk metallic and nano glasses.

Dr. P. Jagan is an Associate Prof. in the department of Mechanical engineering at Mahindra Ecole Center, Hyderabad. He obtained PhD from Washington State University, US. His research focuses on computational solid mechanics with special emphasis on micromechanics deformation in granular materials.

Dr. Syed Khaderi is an Associate Prof. in the department of Mechanical and Aerospace engineering at IIT Hyderabad. He obtained PhD from the University of Groningen, Netherlands. His research interests are in solid mechanics and impact mechanics.

Dr. Viswanath Chintapenta is an Assistant Prof. in the department of Mechanical and Aerospace engineering at IIT Hyderabad. He obtained PhD from the Brown University, US and postdoc from (ABAQUS-DSS) Dassault Simulia. His research interests are in computational materials mechanics with special emphasis on multi scale modelling of metals and composites.

Dr. Ravi Sastri Ayyaari is an Assistant Prof. in the department of Mechanical engineering at IIT Gandhinagar. He obtained PhD from Illinois Institute of Technology, US. His research interests are related to computational solid mechanics with special focus on continuum damage modelling.

Dr. Naresh Verma Datla is an Associate Prof. in the department of Mechanical engineering at IIT Delhi. He obtained PhD from the University of Toronto, Canada. His research interests are related to deformation and failure in material with the aid of experiments and numerical framework

Prof. Sundararajan Natarajan is an Associate Prof. in the department of Mechanical engineering at IIT Madras. He obtained PhD from the Cardiff University, UK and postdoc from the University of New South Walse University, Sydeny, Australia. His research interests are related to computational solid mechanics.

Dr. Saikat Sarkar is an Assistant Prof. in the department of Civil engineering at IIT Indore. He obtained PhD from IISc Bangalore. His research interests are related to computational solid mechanics with special emphasis on structural materials.

Benefit to the Participants

Upon successful completion of the course and securing min. 40% marks in the quiz on last day, participants will be provided with the participation certificates.

N.B.: It is mandatory for the participants to attend 75% lectures and secure min. 40% marks in the objective type quiz to be eligible to get the certificates.

How to Register

Participants needs to register for the workshop via online Google form by clicking the below link;

https://forms.gle/hNhtz2wqQUYTrk9SA

After filling the G-form, participants are requested to send the confirmation email to eswar@iiti.ac.in and indrasen@iiti.ac.in with cc to phd1701205002@iiti.ac.in

Registration Fees

There is no registration fees for the participants from TEQIP sponsered organizations. The nominations of the desired participants on the official letter head should be send through proper channel by the TEQIP coordinator of the organization via email to eswar@iiti.ac.in and indrasen@iiti.ac.in with cc to phd17012005002@iiti.ac.in

For Non-TEQIP Participants

Senior PhD students: Rs.3000/-
Academia Faculty: Rs.5000/-
R&D and Industry Personnel: Rs.10000/-

Mode of Payment: Bank Transfer
Account Name: Registrar, IIT Indore
Account Number: 1476101027440
Bank Name: Canara Bank
Branch: IIT Simrol, Indore
IFSC: CNRB0006223

Upon successful completion of payment, participants are requested to send a copy of transaction receipt to eswar@iiti.ac.in and indrasen@iiti.ac.in with cc to phd1701205002@iiti.ac.in

Volunteers

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