A Two – Day Workshop on

COMPUTATIONAL METHODS FOR MODELLING OF MULTIPHYSICS PHENOMENA

(27th and 28th June 2025)

Organized by

Department of Mechanical Engineering

Indian Institute of Information Technology Design and Manufacturing Kancheepuram

(An Institute of National Importance under Ministry of Education, Govt. of India)

About IIITDM Kancheepuram

Indian Institute of Information Technology, Design and Manufacturing, (IIITDM) Kancheepuram is a public institution established in 2007 by the Ministry of Education, Government of India to pursue design and manufacturing-oriented engineering education and research. IIITDM Kancheepuram offers 5 undergraduate and postgraduate programs, and, 4 B.Tech + M.Tech dual-degree programs in Computer Engineering, Electronics and Communication Engineering, and, Mechanical Engineering; and PhD programs in Computer Engineering, Electronics and Communication Engineering, Mechanical Engineering, Mathematics, Physics, English and Interdisciplinary Design. The institute is located on a 51-acre campus on the outskirts of Chennai, off the Vandalur-Kelambakkam road.

About The Workshop

Multiphysics phenomena are commonly encountered in energy, defence, electronic manufacturing and various other rapidly advancing technological fields. There is a need for robust theoretical, analytical, and/or computational models which can capture the complex and coupled/uncoupled multiphysics nature of the processes. In this workshop, the recent trends in various advanced aspects of computational methods for the modelling of complex multiphysics phenomena will be introduced to the audience with a view to motivate the undergraduate and postgraduate students to take research in applied mathematics and computational mechanics. It will also be helpful for early career researchers to get a glimpse of recent trends in computational multiphysics problems, to establish collaborations with the fellow participants and the expert speakers. A diverse range of fields of science and engineering will be covered by the expert speakers as part of this workshop.

Who can attend?

This workshop is designed for researchers, engineers, and students interested in computational modelling, numerical simulations, and multidisciplinary engineering applications. Prior knowledge of computational methods is beneficial but not mandatory.

Key Topics Covered

- **Multiphysics Phenomena**
  - Electromechanical, thermomechanical, mechanochemical deformation, degradation & fracture problems
  - Inverse problems in multiphysics phenomena
- **Advanced Computational Methods**
  - Polygonal FEM; Hybrid FEM, Scaled boundary FEM
  - Crystal plasticity FEM, Crytal plasticity FFT
  - Advanced optimization algorithms
  - Molecular dynamics/atomistic modelling
  - Meshfree methods – SPH, Peridynamics
- **Case Studies**
  - Design of advanced energy materials
  - Fluid Structure Interaction and instabilities
  - Stability of dynamical systems

Enrolment & Registration Fees

- Registration fee: Rs. 543/- per person (inclusive of GST) is applicable.
- Participants are required to fill the online registration form by clicking on the following link.
  https://forms.gle/SwvCR9ajf3ieQGiM8

Organizing Committee

Chief Patron

Prof. M V Karthikeyan

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