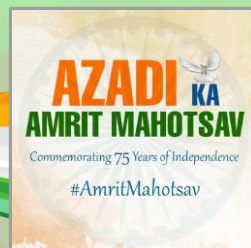# Online Workshop on
# ICME READINESS OF DIGITAL PLATFORMS

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An Invited Technical Presentation Series: July-December, 2021

Organized by
**ICME National Hub**
in association with
**Indian National Academy of Engineering**

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## INTRODUCTION TO COMSOL MULTIPHYSICS

By

### Dr. Prashant Srivastava

Product Developer, Structural Mechanics' Group, COMSOL Multiphysics Pvt. Ltd.

### Date and Time
December 10, 2021 (Friday), 06:00 PM IST

### Zoom link for the event
https://iitk-ac-in.zoom.us/j/99355802182?pwd=WnRaVFFPbzdyQTZ5bkg2OGpiTkg4Zz09
**Meeting ID:** 993 5580 2182
**Passcode:** 505454

◆● **About the Workshop** ●◆

Integrated Computational Materials Engineering (ICME) is an emerging and transformative discipline with a huge potential to accelerate materials discovery, product design and process optimization. The Indian National Academy of Engineering (INAE) is engaged in developing a technology roadmap for "Accelerated Materials Discovery, Scale-up and Exploitation Strategy for Strategic Materials Needs of India". The compilation and integration capabilities of various digital platforms that can assist the ICME community is one of the essential parts of this effort. Therefore, the ICME National Hub at IIT Kanpur, in association with INAE, is organizing a "Workshop on ICME Readiness of Digital Platforms" – a technical presentation series about the capabilities of important digital platforms vis-à-vis accelerated development, production and exploitation of materials and products.
**For more details please visit:** https://www.iitk.ac.in/ICME/INAE-Workshop/

**ICME National Hub Website:** https://www.iitk.ac.in/ICME/
**INAE Website:** https://www.inae.in/

## Abstract

Development of ICME tools requires the understanding of material properties and processes at different length and time scales. In many cases, understanding physical phenomena could be quite complex and require different areas of physics simulated together to get a good understanding of product performance. COMSOL Multiphysics® provides a platform to simulate different physical phenomena simultaneously to produce high fidelity simulation results and thus helps in evaluating their impact on the overall performance. COMSOL Multiphysics® comes with different modules such as Structural Mechanics, Nonlinear Structural Materials, Composite Materials, Fatigue, Metal Processing, Heat Transfer, CFD, Corrosion, and Electrodeposition which can be seamlessly combined to assess the performance of the design in various scenarios. Various Live Link modules, such as Live Link with MATLAB®, Live Link with Simulink®, CAD import Module, can help in interfacing other tools within COMSOL to use the best of their capabilities. COMSOL also provides some general-purpose tools such as Optimization Module to optimize the design parameters to come up with the best possible design. One of the major strengths of the COMSOL is the easy use Equation-Based Modeling platform that can help solve user-defined equations in combination with existing COMSOL modules to simulate complex phenomena.

In this talk, we will focus on the Structural Mechanics, Composites, and Metal Processing capabilities of COMSOL. Some emphasis will also be given to optimization and live link capabilities.

## About the Speaker

**Dr. Prashant Srivastava** received his Ph.D. in aerospace engineering from the Indian Institute of Science, Bangalore, where he investigated the mechanical behavior of polymeric materials using molecular dynamics simulation.

Dr. Srivastava joined COMSOL in 2012, and currently works as a Product Developer within the Structural Mechanics' Group. He has also contributed to the development of the Multi-body Dynamics Module.

◆● **Conveners** ●◆

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