Nonlinear continuum mechanics

Overview

The course begins with an introduction to Cartesian tensor calculus and aims to cover the theory of nonlinear continuum mechanics including kinematics, kinetic and governing equations. The non-linear relationship between the deformation measures and different strain measures, their limitations and applications will be discussed. A major focus will be on the constitutive models, which play a major role in practice. The focus of this course will be on nonlinear hyperelastic models though a brief introduction to plasticity theory will be given. For thermo-mechanical problems, the underlying governing equations will be derived. Finally, different practical examples in the form of classical boundary value problems of continuum mechanics will be discussed to sharpen the relevance and practical applications of the taught material.

Besides the technical knowledge, this course will help the students to independently develop mechanical models and verify and test their applicability and limitations.

Dates for the Course	**18th July, 2016 to 29th July, 2016**
Host Institute	**IIT Madras**
No. of Credits	**2**
Maximum No. of Participants	**30**
You Should Attend If…	▪ You are a senior under graduate student, postgraduate students or a faculty in engineering and applied mathematics. ▪ Engineers and researchers from industry, government organization and R&D laboratories. ▪ You are interested in numerical methods for engineering.
Course Registration Fees	The participation fees for taking the course is as follows: **Student Participants:** Rs.2000 **Faculty Participants:** Rs.5000 **Government Research Organization Participants**: Rs.8000 **Industry Participants:** Rs.15000 The above fee is towards participation in the course, the course material, computer use for tutorials and assignments, and laboratory equipment usage charges. **Mode of payment: Demand draft in favour of "Registrar, IIT Madras" payable at Chennai**
Accommodation	The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation may be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel

Course Faculty

Prof. Dr.-Ing. Timon Rabczuk is a member of the Institute of Structural Mechanics that integrates the chairs of Computational mechanics and Structural Analysis and Component Strength. Prof. Rabczuk's research interests lie in the area of new methods development, in particular eXtended FEM, Meshfree methods and isogeometric analysis for modeling material response, understanding fracture, strain localization and material instabilities.

Dr. Sundararajan Natarajan is a faculty member in the Department of Mechanical Engineering at IIT Madras. His research interests lie in the areas of computational solid mechanics and applied mathematics.

Course Coordinator

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URL:
http://mech.iitm.ac.in/meiitm/personnal/snatarajan