Continuum Mechanics of Dislocations Leading to Plasticity

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Overview

This course is an introduction to non-equilibrium field dislocation mechanics, studying the subject of the dynamics of dislocations as a branch of continuum mechanics. Traditionally, continuum mechanics and the theory of dislocations have been thought of as disparate subjects. In this sense the subject matter is new, but due to rapid recent advances, it is at a stage where a course can be taught on the subject. It is meant for senior undergraduate and graduate students (and senior researchers/faculty) interested in pursuing research in understanding the dynamics of dislocations and how it mediates macroscopic plastic deformation. The course will be taught as a series of lectures with ample opportunity for participant interaction.

Objectives

The primary objectives of the course are as follows:

I. Provide an introduction to the mathematical theory of dislocations from a continuum mechanics point of view.
II. Provide a firm theoretical background for understanding physical phenomena related to dislocations and how they relate to plasticity.
III. Translate the theory to practical numerical algorithms to understand the involved nonlinear behaviour.

Host Institute	**IIT Madras**
Dates for the Course	**18th December to 29th December 2017**
No. of Credits	**2**
Maximum No. of Participants	**30**
You Should Attend If…	▪ You are a senior undergraduate student, postgraduate student or a faculty member from an academic institute, with interest in dislocation dynamics. ▪ Engineers and researchers from industry, government organization and R&D laboratories with interest in dislocations and plasticity.
Fees	The participation fees for taking the course is as follows: **Participant from Industry or Government Research Labs: Rs. 10,000** **Faculty or Staff Member of an Academic Institute: Rs. 5,000** **Student Participants: Rs. 2,000** The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges. **Mode of payment: Demand draft in favour of "Registrar, IIT Madras" payable at Chennai**
Accomodation	The participants may be provided with hostel accommodation, depending on the availability, on payment basis. Request for hostel accommodation should be submitted through the link: http://hosteldine.iitm.ac.in/iitmhostel

The Faculty

Prof. Amit Acharya is a Professor at Carnegie Mellon University, USA. His broad research interests are in continuum mechanics, mathematical materials science and applied mathematics.

Dr. Ratna Kumar Annabattula is an Assistant Professor at IIT Madras. His research interest include mechanics of thin films, granular materials and multiscale materials modeling.

Dr. Parag Ravindran is an Associate Professor at IIT Madras. His research interests are in modelling of viscoelastic materials.

Course Co-ordinators

Dr . Parag Ravindran and
Dr. Ratna Kumar Annabattula

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