Partition of Unity Methods

Overview

The course will provide the principles and procedures that lead to the development and advancement of emerging numerical techniques that go beyond the finite element method to solve partial differential equations, classified as Partition of Unity Methods (PUM). The essentials of the underlying theory for these methods will be provided to enable students to appreciate the advantages, limitations and possible pitfalls of such numerical methods. PUMs provide a general framework for constructing approximation spaces to handle problems with discontinuities or highly oscillatory solutions. The course will introduce participants to construct enriched spaces, discuss their implementation, convergence properties and assess their accuracy through the solution of problems in engineering and applied sciences. Representative implementation of the methods illustrating the performance and practical aspects will be discussed.

Course participants will learn these topics through lectures and hands-on numerical experiments.

Dates for the Course	**12th December, 2016 to 18th December, 2016**
Host Institute	**IIT Madras**
No. of Credits	**1**
Maximum No. of Participants	**50**
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.1000 **Faculty Participants:** Rs.4000 **Government Research Organization Participants**: Rs.6000 **Industry Participants:** Rs.8000 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. N Sukumar is a member of the Structural Engineering and Structural Mechanics (SESM) faculty at UC Davis and also a member of the Graduate Group in Applied Mathematics. Prof. Sukumar's research interests lie in the area of new methods development for failure modeling in materials and in ab initio electronic structure calculations.

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