ANNOUNCEMENT

SHORT TERM COURSE

On

SIMULATION AND DESIGN USING EXTENDED FINITE ELEMENT METHOD (XFEM)

(13–17 December, 2010)

OBJECTIVES

Recently, Extended Finite Element Method (XFEM) has emerged as a novel numerical method to solve various problems in different areas of engineering and sciences including failure analysis, crack growth, multiphase flows, solidification, microstructure modeling, material interfaces, bio-mechanics, fatigue, shear bands, fluid-flow, multi-phase flow, thermo-mechanics, boundary layer, etc.

The objective of this course is to introduce this emerging numerical method to budding scientists and engineers so that they are equipped to solve various problems of engineering, sciences and industries. This course is of interest to those who works in the field of aeronautics, automotive, transport, mechanical, civil and nuclear industries, and is best suited to the teachers, researchers and R&D executives and will be very useful to any Industry who does FEA and FVM based numerical simulations using commercial software packages such as ANSYS, ABAQUS, LS-DYNA, FLUENT, STAR-CD.

A basic background of engineering/applied sciences along with MATLAB and finite element methods are necessary for the understanding of the material covered in the course, hence, the basics of finite element method and MATLAB will be also be covered. The course will start from the basics so as to be understandable by all. The emphasis will be given to the implementation aspects of XFEM in MATLAB. Through this course, the participants will be able to write their own codes and implement this novel method to solve their own problems. They can also integrate this method with existing FEA codes/software. Moreover, hands on experience of XFEM features and capability will be demonstrated by solving some tutorial problems in ANSYS/ABAQUS.

COURSE CONTENTS

- Basic concepts of finite element method;
- Introduction to extended finite element method;
- Concepts of partition of unity and enrichment;
- Level-set methods and vector level sets;
- Typical enrichment functions for the XFEM;
- Concept of blending elements;
- XFEM for weak discontinuities;
- XFEM for strong discontinuities;
- XFEM for interfaces, bi-materials;
- XFEM for holes, and inclusions;
- Enrichment for fluids, boundary layers;
- Extrinsic and intrinsic XFEM;
- XFEM Implementation in 3-D;
- Basic Commands of MATLAB;
- MATLAB implementation of XFEM;
- ANSYS/ABAQUS XFEM Tutorials;

ELIGIBILITY

Persons with adequate experience in the related field and right aptitude towards learning may participate in the program.

NOMINATION AND CORRESPONDENCE

Interested persons should send the nomination on the enclosed Performa duly sponsored by the appropriate authority along with the course fee to the Head, Continuing Education Centre, Indian Institute of Technology Roorkee, Roorkee—247 667.
Tel : 01332 – 284327 / 285227
FAX : 01332 – 285545 / 273560
CONTINUING EDUCATION CENTRE
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE
ROORKEE
NOMINATION PROFORMA

SHORT TERM COURSE

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SIMULATION AND DESIGN
USING EXTENDED FINITE
ELEMENT METHOD (XFEM)

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Name & Address of the Candidate …………………………………………………………………………………………………………………………………………………………………………………
Tel. (With STD code) (Off.)………………………(Res.)………………………… FAX : ………………………(Mobile)….….………………
Address of Sponsoring Authority:
Tel. (With STD code) (Off.)………………FAX
E-mail…………………………………………………

1. Draft No. …………………………………….. dated ………………… is enclosed.
2. Medical fitness certificate of the candidates is also enclosed herewith

Signature of Candidate Signature of Sponsor
With Seal

Note: Please enclose your C.V. without any supporting documents.

PROGRAMME FEE

The course fee for participants from R&D center / Industry is Rs. 15,000.00 (Rupees fifteen thousand only) and that for participants from academia and institutions is Rs. 12,000.00 (Rupees twelve thousand only). Programme fee includes boarding and lodging at the campus guesthouse of the Continuing Education Centre, course material and admission-cum tuition fee.

PAYMENT

The course fee should be sent in advance through a bank draft along with the duly filled nomination proforma. The DD should be drawn in favor of “Head, CEC, IIT Roorkee”, payable at Roorkee with intimation to the course coordinator on or before 26 November, 2010.

NOMINATION AND CORRESPONDENCE

The nomination form, duly forwarded by the sponsoring agency, should be sent to:
Head
Continuing Education Centre
Indian Institute of Technology Roorkee
Roorkee – 247 667
Tel : 01332 – 284327 / 285227
Fax : 01332 – 285545 / 273560

SPECIAL NOTE

The decision to run the course depends on the response and number of candidates. It is therefore advised that the candidates should proceed to join the course only on receipt of confirmation of admission.

IIT ROORKEE

The Indian Institute of Technology Roorkee has an illustrious history and a glorious past. It has its foundation in the Thomson College, which was founded in 1847, to train technical manpower for construction of Ganga canal. It was the first Engineering College of British Empire. In the year 1949, this great institution was accorded the status of the first technological university of independent India and was renamed as University of Roorkee. On September 21, 2001, the Government of India declared it as the nation’s seventh Indian Institute of Technology. The Department of Mechanical Engineering came into being in the year 1946 and was renamed as Department of Mechanical & Industrial Engineering on its silver jubilee in 1971. At present it offers undergraduate courses in the area of Mechanical Engineering and Industrial Engineering. The department offers Master of Engineering courses in Machine Design Engineering, Production and Industrial Systems Engineering, Thermal System Engineering, CAD/CAM & Robotics and Welding Engineering. It runs Ph. D. program in all the areas of specialization and about 55 research scholars are pursuing work for their Ph. D. degree at present. The department has completed around twenty sponsored R & D projects and a large number of consultancy works indicating its strength of competent faculty. IIT Roorkee is situated at the Foothill of the Himalayas, in Hardwar district, in the state of Uttarakhand.

COURSE COORDINATORS

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