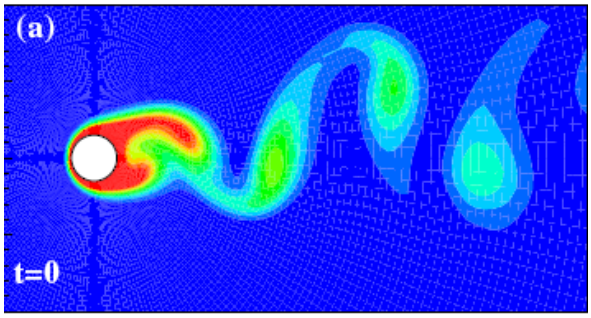
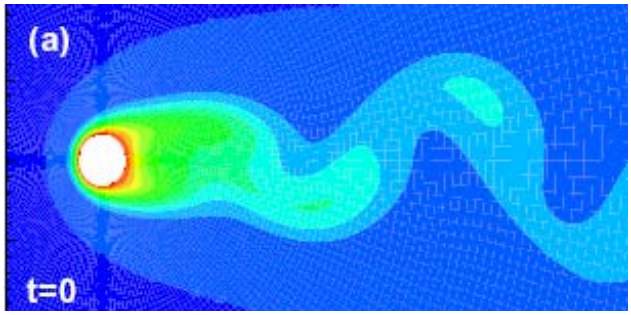
QIP Sponsored

Short Term Course

Recent Advances in Computational Sciences with Applications

November 22-27, 2010





Organized by

Department of Mathematics
Indian Institute of Technology, Kharagpur
Kharagpur 721302, West Bengal

Introduction

Mathematical modeling and computer simulation have proved tremendously successful in the field of engineering in recent years. Computational Science has enabled technological developments in virtually every area of our lives. The basic aim of this course is to provide state-of-the-art computational methodologies pertaining to industrial and real life problems. The course is designed so as to introduce the advanced topics starting from the basics. The inherent nonlinearity of the system of differential equations and singularity demands special attention in modeling the problems applicable to industry. Special emphasis on nano-scale computation and application to bio-technology will be provided. Exposure to advanced programming, data base system and computer software will be introduced. Laboratory classes will be conducted to train participants in sophisticated computer algorithms.

Impact

This course will provide an exposure to modern computational techniques for modeling complex engineering problems, such as fluid flows, heat transfer, structural design, nano-fluids and biomedical technologies. It may serve an introductory course on current topics of research related to microfluidics, heat transfer analysis and complex flow phenomena. The course will also benefit faculty who would like to enrich a variety of advance courses with new methods and applications. The training on computer coding techniques will also enable the participants to analyze the practical problems.

Topics to be covered

- Review of basic methods (e.g., Finite Difference, Finite Volume and Finite Element Methods).
- Monotone iterative Methods, application to solve Ordinary and Partial Differential Equations (ODE & PDE).
- Advanced Methodologies for System of ODE/ PDE.
- Discrete Vortex Method and application to vortical flows.
- Volume of Fluid Method, application to multiphase dynamics.
- Singular Boundary Value Problems applicable to biomedical sciences.
- Nano-scale Computations: Molecular Dynamics Simulation, Lattice Boltzmann Method.
- Modeling and computation of Microfluidics/ Nanofuidics.
- Advanced Programming Techniques: Object Oriented Programming, JAVA, DBMS.
- Modeling and simulation of Industrial and Natural Problems such as, Fluid flow problems, drug delivery, biomedical scienc es, Multiphase Flows, Nano-Technology.
- Hands on experience to execute algorithms on High-end servers will be provided.

Resource Persons

Experts engaged in teaching and research in this area for several years in the mathematics department and sister departments at IIT Kharagpur along with renowned scientists from industry/ institutes will be invited to deliver lectures.

Participants

- 40 participants from faculty members of AICTE approved engineering colleges/ university/ institutes having specialization in Mathematics/ Mechanical/Civil/Aerospa ce/ Chemical Engineering.
- Few sponsored participants from Industry/ Research Organizations will be considered

- The course is free for participants of AICTE while sponsored participants have to pay for boarding/ lodging fees at IIT rates plus a course fee of Rs.4,500/-.

Financial Assistance

The faculty members of AICTE recognized engineering institutions will be eligible for to and fro railway fare via shortest route limited to a maximum of AC 3 Tier class and DA to cover the lodging and normal boarding expenses during the course period at IIT Kharagpur.

About IIT Kharagpur

The Indian Institute of Technology, more commonly known as IIT, situated about 120 km from Kolkata. Kharagpur can be reached in about 2 hours by train from Howrah railway station of Kolkata or 2 hours by car from Kolkata Airport. Kharagpur is also connected by direct train services to most major cities of the country. It is the oldest, the biggest (both in terms of student intake and campus area) and the most versatile in terms of its academic units among all the 15 IITs in India.

Course Coordinators

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Kharagpur 721302
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Important Dates

The last date for the receipt of duly endorsed applications: 20th September, 2010

Intimation to selected participants: 05.10.2010

Last date of receiving caution deposit: 30.10.2010

Please send the duly filled-up application form (next page) before 20th September to the coordinator for registration.

N.B.: The selected participants will have to send a demand draft of worth Rs.1000/- (refundable) payable at Kharagpur.

Application Form

A QIP Sponsored Short Term Course on

Recent Advances in Computational Sciences with Applications

November 22-27, 2010

1a. Name (in block letters):

1b. Date of birth: **1c. Sex (for the purpose of accommodation): M/ F**

2. Designation:

3. Organization:

4. Address for communication (with PIN Code):

Mobile No./ Fax No. :

E-mail ID:

5. Highest Academic Qualification: **6. Specialization:**

7. Experience (in years): (a) Teaching: **(b) Professional :**

Please register me for this course to be held at Department of Mathematics, IIT Kharagpur.

Place:

Date: **Signature of the applicant**

Forwarding & Recommendation

This is to certify that this Institute/ college is AICTE approved and the applicant, who is a faculty member of our Institute/ college, is permitted to participate in the QIP sponsored Short Term Course.

Signature of the Forwarding Authority:

Designation:

Official Seal