Completed Registration form along with 1-page write-up (on reasons to attend this course) should be sent by post to the following address:

Prof. Atul Sharma
Course Coordinator
Department of Mechanical Engineering
Indian Institute of Technology Bombay
Powai, Mumbai – 400 076
Phone: (022) – 25767505
Fax: (022) – 25726875

While sending by post, keep informed by an email to atulsharma.iitb@gmail.com, with attachments as (a) the 1-page write-up and (b) scanned copy of the filled-in and signed form. The title of the email should be "QIP course on CFD: Submitting Application".

IMPORTANT DATES

Deadline for submitting Application: April 21st, 2017
Notification of Acceptance: April 28th, 2017
Course Dates: May 29 – June 02, 2017

- Incomplete application forms will not be entertained.
- For additional copies of the registration form, use a photocopy of this brochure or type in the format given. For further details:
  http://www.qip.iitb.ac.in/qipcourse2017.php

VENUE FOR COURSE

Classes will be held in the Seminar Hall, Van Vihar Guest House, IIT Bombay.

DATE & TIME FOR REGISTRATION

May 29, 2017, 9 AM at the venue for the course.

ELIGIBILITY

Faculty members of degree level engineering colleges recognized by AICTE are eligible to attend the course.

COURSE EVALUATION

Successful participants would be awarded 'Course Completion Certificate'.

REGISTRATION

There is no registration fee for the course. All short-listed candidates are required to confirm their participation by sending a Demand Draft of ₹.2000/- in the name of "Registrar IIT Bombay".

The above amount will be refunded to the participant if he/she attends the course. In case a participant does not attend the course, the above amount will be forfeited. Shortlisting and confirmation of eligible candidates will be on a first come first served basis up to a maximum of 40 candidates.

TRANSPORT, BOARDING & LODGING

Participants are entitled for II class (Sleeper Class) or III AC railway fare to and fro by the shortest route from college to IIT Bombay. All participants will be given auto rickshaw fare from Kanjurmarg/Andheri to IIT on the dates of arrival and departure. Local participants will be paid second class railway fare or BEST Bus fare.

Boarding and lodging will also be provided free of cost. Accommodation will be provided in the students Hostels or Guest House on sharing basis. Since accommodation is limited, family members of the participants cannot be accommodated.

For information on other Quality Improvement Programmes at IITB, contact:

Prof-In-Charge (CE & QIP),
IIT Bombay, Powai, Mumbai 400 076
Tel. No. : (022) 25767006.
Email : qip@iitb.ac.in
For further details: http://www.qip.iitb.ac.in

FACULTY

The teaching faculty in this course consists of Prof. Atul Sharma, who is also the course coordinator.

COURSE MATERIAL
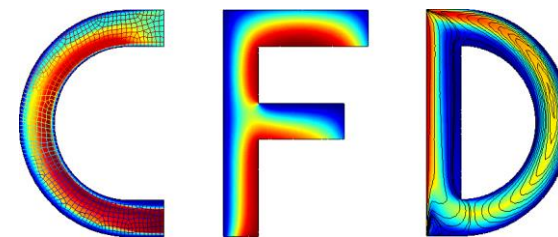
- **Book:** Atul Sharma, Introduction to CFD: Development, Applications, and Analysis, Ane Books Pvt. Ltd., New Delhi, 2017.
- **Computer-Codes** presented in the book and used for the various Lab sessions of the course.

QIP Short Term Course On

First Course in

Computational Fluid Dynamics:

Development, Application & Analysis

(FCCFD-2017)

May 29 – June 02, 2017

Office of
Continuing Education &
Quality Improvement Programmes

Department of Mechanical Engineering
Indian Institute of Technology Bombay
Powai, Mumbai – 400076

INTRODUCTION

Computational Fluid Dynamics (CFD) is a theoretical-method of scientific and engineering investigation, concerned with the development and application of a video-camera like tool (a software) which is used for a unified cause-and-effect based analysis of a fluid-dynamics as well as heat and mass transfer problem. The simulation results in prediction of the flow fields in the domain of interest and of engineering parameters, which are very useful in the design and optimization of processes and equipment. It is an open ended application of undergraduate core courses of fluid mechanics and heat transfer. CFD reduces the time and cost for designing and analyzing engineering systems and is slowly becoming part and parcel of Computer Aided Engineering (CAE).

In academics, CFD is taught in different branches of engineering: aerospace, chemical, civil, mechanical and metallurgy. In industry, CFD is rapidly developing as a powerful analysis tool used in diverse areas like aerospace, automobile, turbomachinery, chemical, electronics cooling, biomedical, etc. The increasing importance of CFD simulation-software development, application and analysis, in the Indian industry and research organizations, along with the lack of trained manpower in this area has greatly increased the significance of this course. However, there is lack of trained teachers for this course.

OBJECTIVE OF THE COURSE

The objective of this course is to make you learn all the 3 aspects of CFD: development, application, and analysis. In this course, an attempt is made to simplify the subject even for readers who have little or no experience in CFD, and without prior knowledge of fluid-dynamics, heat-transfer and numerical-methods. The major emphasis is on simplification of the mathematics involved by presenting physical-law (instead of the traditional differential equations) based algebraic-formulations, discussions, and solution-methodology. The physical law based simplified CFD approach keeps the level of mathematics to school education, and also allows the reader to intuitively get started with the computer-programming. Another distinguishing feature of the present course is to effectively link the theory with the computer-program (code); covered in the lab sessions. For the lab sessions, a set of computer programs and a detailed documentation, developed at IIT Bombay, will be given to the participants. The programs are written in Scilab, a free open source software for numerical computation. Carefully designed example problems will be solved using the computer programs.

Furthermore, the present course is structured for a module-by-module code-development of the two-dimensional numerical formulation; the codes are given for 2D heat conduction, advection and convection. The present subject involves learning to develop and effectively use a product -a CFD software. The details for the CFD development presented here is the main part of a CFD software. Furthermore, CFD application and analysis are presented by carefully designed example as well as exercise problems; not only limited to fluid dynamics but also includes heat transfer. The reader is trained for a job as CFD developer as well as CFD application engineer; and can also lead to start-ups on the development of "apps" (customized CFD software) for various engineering applications enabling CFD-SOFTWARE MAKE-IN-INDIA.

COURSE CONTENTS

Part 1: Introduction and Essentials

1. Introduction
2. Introduction to CFD Development, Application and Analysis
3. Essentials of Fluid-Dynamics and Heat-Transfer
4. Essentials of Numerical-Methods

Part 2: CFD for a Cartesian Geometry

5. Computational Heat Conduction (CHC),
6. Computational Heat Advection,
7. Computational Heat Convection,
8. CFD: Finite Volume Method,
9. CFD on a Staggered Grid
10. CFD on a Co-located Grid

Part 3: CFD for a Complex Geometry

11. Computational Heat Conduction
12. CFD on a Curvilinear Grid

QIP Short Term Course
on
**First Course in CFD:
Development, Application & Analysis
(FCCFD-2017)
MAY 29–JUNE 02, 2017**

Registration Form

Name (in block letters) : _____

_____

Designation :_____

Organization : _____

_____ _____

Mailing Address :_____

_____

Age :_____   Sex (M/F):_____

Mobile :_____

Email : _____

Educational Qualifications:

Prior Exposure to CFD: Yes / No

Accommodation in Campus: YES / NO

Signature of Applicant:

Sponsorship & signature of Head of the College / Institute (with date & seal).
(IMPORTANT: BY SIGNING ABOVE HEAD OF THE COLLEGE/INSTITUTE CERTIFIES THAT APPLICANT IS A FACULTY MEMBER OF DEGREE LEVEL ENGINEERING COLLEGE RECOGNIZED BY AICTE)
Form should be complete otherwise the application will be rejected