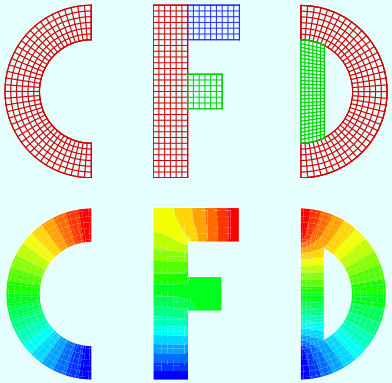
A short term course on

Basics of Computational Fluid Dynamics: Theory and Programming

20 - 22 July 2017



Coordinator

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Organised by
Department of Mechanical Engineering
Indian Institute of Technology (BHU), Varanasi
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Course objective

This course is designed for beginners who want to explore computational fluid dynamics (CFD) through programming. Modelling of any system becomes important when we do not have analytical or experimental solution of a particular problem at hand. The computational fluid dynamics is one of the techniques by which a complicated real problem involving heat transfer and fluid flow can be solved. Now-a-days it has become almost regular practice of the industry to test the performance of any component using CFD before launching into the market. Therefore, it is the high time to learn and explore computational fluid dynamics to its fullest. This course will provide a strong foundation to those who really want to become a CFD expert.

Course description

Basics of programming: knowledge of loop, logical statement, read/write, opening/closing a file, function, and subroutine etc.

Fundamentals of numerical methods: root finding techniques, solving ordinary differential equations, curve fitting techniques

Basic concept of fluid flow and heat transfer: a brief overview of the basic conservation equations for fluid flow and heat transfer, general transport equation

1-D diffusion problem: steady and unsteady, discretisation using finite difference and finite volume methods, direct and indirect solution procedures

1-D convection-diffusion problem: steady and unsteady, UDS, CDS, and Power law schemes and its merits and demerits

Two-dimensional Navier-Stokes equations: steady and unsteady, staggered and collocated arrangements, mesh generation techniques

Multiblock techniques: block-structured orthogonal grid, solution of Navier-Stokes equations on such grid

Uniqueness of the course

This course is unique in a sense that more emphasis will be given to the hands on practice in writing the code. The programming code will not be given to the participants but they will learn how to write their own code throughout the course. And, at the end, participants will be equipped with the knowledge base needed for writing such code for a problem involving heat transfer and fluid flow.

Important dates

Last date of registration (if seats available): **10 July, 2017**

Note: Only limited number of participants will be selected based on first-cum-first service.

Who can attend

This course is designed for industry personnel/teachers/students who want to learn the fundamentals of CFD through programming for the purpose of teaching or research or both. The course aims at solving a complicated algebraic equation, coupled ordinary differential equations, linear and non-linear partial differential equations through writing the code. Therefore, anyone interested in learning the skills for writing the code for such problems is welcome.

Course evaluation

There will be a continuous monitoring of the performance of the participants. Depending upon their performance, winners will be announced.

Certificate

A course completion certificate will be given to all the participants.

How to reach IIT(BHU)

IIT(BHU) is situated in one of the holiest and oldest city of India, Varanasi. The city is well connected to major cities of India through plane, rail and bus. The institute is around 7 km from Varanasi railway station and about 30 km from the Babatpur (Varanasi) airport. IIT(BHU) can also be reached via Mughalsarai, about 10 km from Varanasi.

Registration fee (Rs.)

Participants	IIT(BHU)	External
Student	2000	4000
Faculty	5000	5000
Others (Industry/Research Fellow)	5000	10000

The registration fee includes the charges for course materials and refreshment during the course.

Accommodation

Accommodation at IIT(BHU) guest house can be provided to the external participants at a rate (to be paid by the participant) as per the institute rule on first-cum-first service.

How to register

- Interested participants can send an email to amitesh.mec@iitbhu.ac.in or stccfdtp@gmail.com with a subject line CFDTP17. Please mention your name, designation (student, faculty, or others), address and mobile number.
- Depnding upon the availability of the seat, an email along with the payment details will be sent as a provisional confirmation.
- After receiving email confirmation, kindly pay online or speed post the Cheque/DD to the address given below.
- Mention your name, designation (student, faculty or industry professional), address, mobile number and email id on the back of the Cheque/DD. Please write “STC CFDTP 2017” on the envelope.
- If registration fee is paid via online transfer, the participant should inform the transaction details/proof of money transfer via email. Kindly mention participant’s name in the remark section during the bank transaction.

  Note: Participants are requested to bring their own laptop.

Address

For sending the Cheque/DD or any query:

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Organising committee

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Prof. P. Shukla
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