भारतीय प्रौद्योगिकी संस्थान गुवाहाटी
Indian Institute of Technology Guwahati

Short Term Course

Computational Fluid Dynamics for Incompressible Flows

In ONLINE mode

November 9th -13th, 2020

Conducted by :
Department of Mechanical Engineering

Organized by :
Knowledge Incubation for TEQIP
Centre for Educational Technology
URL: http://www.iitg.ac.in/cet

ABOUT THE COURSE

Computational Fluid Dynamics (CFD) is the numerical analysis of fluid flow, heat transfer and related transport phenomena. It is being used to solve wide variety problems in almost all industrial sectors: food processing, water treatment, marine engineering, automotive, aerodynamics, gas turbine design and health care. In CFD, fluid flow and related transport equations are discretized using some discretization techniques and then algebraic equations are numerically solved to find velocity, temperature, pressure and other variables like species concentrations. CFD is now used for several applications that involve turbulence, multiphase flow, chemical reactions, combustion, radiative heat transfer, fluid flow with electro hydrodynamics and many more. The use of CFD can result in less iteration to the final design, shorter lead times, and fewer expensive prototypes to produce.

Faculty members of IIT Guwahati will deliver lecture.

COURSE CONTENTS

This course will primarily cover the basics of computational fluid dynamics starting from classification of partial differential equations, linear solvers, finite difference method and finite volume method for discretizing Laplace equation, convective-diffusive equation & Navier-Stokes equations. Few advanced topics pertaining to multiphase flows, turbulence and smoothed particle hydrodynamics will also be discussed. There will also be a learning session using ANSYS Fluent that will help participants to relate the theory to practice. The course will help faculty members, students and researchers in the field to get an overview of the concepts in CFD and appreciate the use of commercial CFD packages.

Topics to be covered

- Classification of Partial Differential Equations
- Finite Difference Method
- Finite Volume Method
- Linear Solvers
- Vorticity-Stream Function Formulation
- Solutions of Navier-Stokes Equations – MAC & SIMPLE
- Turbulent Flows
- Multiphase Flows
- Smoothed-Particle Hydrodynamics
- Learning Session on ANSYS Fluent

ELIGIBILITY

The course is open to faculty members/students from **TEQIP mapped Institutions/Engineering Colleges/ATUs**. No course fee is charged.

IMPORTANT DATES

The last date for the receipt of duly sponsored application:
By email: scanned copy: 26/10/20
Hard copy must reach by: 05/11/20
Intimation of selection: 06/11/20

SELECTION CRITERIA

Number of seats: 50.
Selection will be based on First cum first served basis. Participants from TEQIP-III mapped institutes will get preference.

ADDRESS FOR CORRESPONDENCE

Dr. Amaresh Dalal
Department of Mechanical Engineering
Indian Institute of Technology Guwahati
Guwahati- 781 039
E-mail: amaresh@iitg.ac.in

http://www.iitg.ac.in/amaresh/

Application Form

1. Name (block letters):

2. Sex: ☐ Male ☐ Female

3. Category: ☐ General ☐ Reserved

4. Highest Academic Qualification:

5. Specialization:

6. Designation & pay scale:

7. Name of the organization:

8. Experience:

(a) Teaching: (b) Industrial:

9. Address for communication:

Pin code: Mobile No.:

E-mail:

10. Choice of Accommodation: ☐ Guest House

☐ Hostel ☐ Will make my own arrangement.

Please register me for the course on **"Computational Fluid Dynamics for Incompressible Flows"** to be held in ONLINE mode at IIT Guwahati.

I am sending an advance copy of this application by email to the coordinator of the course.

I undertake to send the Hard copy signed by the Head of my Institution.

(Please **strikethrough** the below part if you are from TEQIP institutions)

Place:

Date: *Signature of the applicant*

SPONSORSHIP / NOMINATION CERTIFICTE

Prof/Dr./Mr./Ms./Mrs./.....

.....

is an employee of our institute and his/her application is hereby sponsored/nominated. The applicant is permitted to attend the short-term course **"Computational Fluid Dynamics for Incompressible Flows"** at IIT Guwahati during 09/11/20 to 13/11/20 if selected.

I also certify that our institute/college is under the "Institution List" of 3rd phase of TEQIP Project of MHRD.

Date

Signature of Authority

Designation

Official Seal

Selected participants will be informed by e-mail. The duly sponsored/nominated application form should be mailed to:

Dr. Amaresh Dalal

Department of Mechanical Engineering

Indian Institute of Technology, Guwahati
North Guwahati, Guwahati-781 039, Assam
Ph. No. 0361-2582677(O), 9678011128 (M)
Email: amaresh@iitg.ac.in

ABOUT TEQIP

TEQIP conceived in pursuance of the NPE-1986 (revised in 1992) by Govt of India as a long term program to be implemented in different phases. After successful execution of TEQIP II, TEQIP III starts from 2017-18 as Central Sector Scheme with a focus on the Low Income States, Northeast, Hill States and Islands. The third phase of TEQIP is also special in a way that it incorporates twinning arrangements between mentee & mentor institutions with an emphasis on Focused Training (PT) and Focused Interventions from IITs in terms of deliverables and accountability. KIT, established at IIT Guwahati under 2nd phase of TEQIP is a focal point for training Faculty, Staff and students from TEQIP-III institutions in Knowledge Engineering, Content Creation, Improving Teaching, Pedagogy & administrative skills in identified niche areas/disciplines.

ABOUT KIT

KIT (**K**nowledge **I**ncubation Cell for **T**EQIP) at IIT Guwahati functions as a multi-disciplinary as well as interdisciplinary Innovation Incubation Centre with a focus to impart Knowledge, infusing innovation and leading a path to achieve academic excellence. Its activities are in the area of improving quality of technical education, incubator of Innovative Ideas; implementer of contemporary pedagogy practices and development of Learning Content in Technical institutions while mentoring them.

ABOUT IIT GUWAHATI

IIT Guwahati campus is spread over a sprawling 785 hectares plot of green land on the north bank of the river Brahmaputra around 25 km from the heart of the city. With hills and vast open spaces, the campus provides an ideal setting for training. Details on how to reach IITG Campus are available on the institute website

Website: www.iitg.ac.in