

Patrons:

Dr. M. Kumar, Principal
University College of Engineering
Osmania University

Prof. Atal Chaudhuri, Vice Chancellor
VSSUT, Burla, Odisha

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Department of Mathematics, UCE, OU

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Dr. K. Ramesh Babu
Dr. P. Tirupati
Mr. K. Ramalingaiah

Department of Mechanical Engineering, UCE, OU

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Prof. Sriram Venkatesh
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Dr. Buchaiah (Scientist)

Department of Mathematics, VSSUT, Burla

Dr. Susanta Kumar Paikray, Head
Dr. Jayaprakash Panda
Dr. Mahendra Kumar Jena
Dr. Saroj Kumar Padhan
Ms. Itishree Nayak
Dr. Ashok Kumar Sahoo
Dr. Smrutiranjana Mohapatra
Mr. Niran Meher

Resource Persons:

- (1) Dr. Yogesh G. Bhumkar, School of Mechanical Sciences IIT Bhubaneswar, Bhubaneswar, Odisha,
- (2) Prof. P. Ramesh Babu, Department of Mechanical Engineering, UCE, OU.
- (3) Prof. P. Ushasri, Department of Mechanical Engineering, UCE, OU, Hyderabad.
- (4) Dr. Y. Rameshwar, Department of Mathematics, UCE, OU.
- (5) Prof. J. P. Panda, Dr. S. R. Mohapatra, Dept. of Mathematics, VSSUT, Burla
- (6) Dr. Smrutiranjana Mohapatra (SM), Department of Mathematics, VSSUT, Burla, Odisha.
- (7) Dr. H. P. Rani, Department of Mathematics, NITW.

Registration Fee Particulars:

Research Scholars	Rs.1000/-
Faculty	Rs.2000/-
Industry Participants	Rs.3000/-

The entire registration fee is to be collected in the form of DDs/online transfer using the following details:

DD Details	Online Transfer Details
Demand Draft in favor of "The Head, Dept. of Mech. Engg, UCE, OU " payable at SBI, Hyderabad	Account No: 62102171639 IFSC: SBIN0020071

FACULTY DEVELOPMENT PROGRAMME (FDP)

on

High Accuracy, High Performance Computing of Fluid Flows

30 December 2019 – 03 January 2020

Sponsored by

TEQIP-III, University College of
Engineering (UCE),
Osmania University (OU)

Jointly Organized by



Departments of Mathematics and
Mechanical Engineering, UCE, OU,
Hyderabad, Telangana

In Association with



Department of Mathematics,
VSSUT, Burla, Odisha

About Osmania University:

Osmania University, established in 1918, is the seventh oldest in India, the third oldest in south India and the first to be established in the erstwhile princely state of Hyderabad. The University has a vision of developing, enhancing, and improving the quality of human resources to meet the challenges of regional, national and global socio-economic changes. Its mission is to achieve excellence in teaching and research and to create opportunities for the students to contribute to the national and regional development.

Osmania University is re-accredited by the National Assessment and Accreditation Council (an Autonomous Institution of the University Grants Commission) as 'A+' Grade University.

About the Course:

This is a specialized course aimed at introducing a methodology to solve complex linear/nonlinear problems numerically using HPC. This is a unique course on HPC which not only trains participants how to write parallel programming codes on a multi-CPU framework but also provides information about high accuracy schemes which requires significantly lesser computational resources and helps in achieving HPC. This course is a blend of parallel computing along with the numerical methods which requires at least 1000 times less computing resources than any traditional numerical methods. For example, at the end of the course the participants will appreciate the difference between computational cost associated with 10^9 grid points in traditional discretization method calculation vs 10^6 grid points in efficiently designed methods.

Course Contents:

Module 1: **Introduction to CFD**

Need of high accuracy and high performance computing

Module 2: **Waves and disturbances in fluid flow**

Physical dispersion relation; Dispersive and non-dispersive waves; Spatial and temporal spectra in fluid flow; Spectral analysis of numerical methods.

Module 3: **High accuracy schemes for Large Eddy Simulations**

Dispersion relation preservation property (DRP); Explicit and implicit spatial discretization schemes; Compact schemes; Optimization of error in the spectral resolution of high accuracy compact schemes.

Module 4: **Numerical filters: Applications in LES**

Construction, analysis and use of numerical filters for LES; Aliasing error and de-aliasing using filters.

Module 5: **Grid generation**

Generalized coordinate transformation; Construction of Elliptic and Hyperbolic grids; Grid metrics and their role in simulation

Module 6: **High performance computing**

Introduction to parallel computing; Message Passing Interface; Domain decomposition technique; Computation of complex transitional and turbulent flows.

Module 7: **Lab sessions**

Hands on training will be provided to solve some of the basic as well as tutorial problems. Additionally, participants will get opportunity to write simple parallel computing codes to solve model problems in lab sessions.

Theme of FDP:

Faculty development programs provide opportunities for faculty to advance in their professional development. Research is one of the primary job functions of faculty members in institutions of higher education. To implement effective policies and practices that promote research productivity, faculties and administrators of institutions of higher education need to be aware of the relationship between research self-efficacy beliefs and research productivity. In this regard we have chosen to conduct the FDP on HPC in order to solve large problems in science, engineering with high accuracy results.

Eligibility:

The program is open to the faculty of science, engineering colleges, and researchers/scientists working in R&D organizations and practicing engineers from industries.

Accommodation:

Accommodation will be provided in the university Guest House on payment basis.

How to Apply:

A filled in form of application in the prescribed format duly signed (along with demand draft) should reach the coordinators by post or by E. mail.

rameshwar@osmania.ac.in / prbmechou@yahoo.com

Selection Criteria:

Selection will be done based on first-come-first-serve basis to a maximum number of 40.

Important Dates:

Last date (Application & DD)	20/12/2019
Selection List by E- mail	25/12/2019
Duration	30/12/2019 to 03/01/2020

Coordinators:

Prof. P. Ramesh Babu,
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Mobile No.: 8121846858

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Mobile No. : 8977241872

FDP on “**High accuracy, High performance computing of fluid flows**”
30 December 2019 – 3 January 2020, UCE, OU

APPLICATION FORM

1. Name :
2. Designation :
3. Institution :
4. E. Mail :
5. DD. No.: Bank : Date:
Amount :
6. Address for correspondence :
7. Educational Qualifications :

Declaration:

The information provided is true to the best of my knowledge. If selected, I agree to abide by the rules and regulations of the FDP and shall attend the course for the entire duration. I also undertake the responsibility to inform the Coordinator in case, I am unable to attend the course.

Certificate

Dr. /Mr. /Ms. is an employee of our Institute/Organization and is hereby sponsored to participate in the FDP on “**High accuracy, High performance computing of fluid flows**”, sponsored by TEQUIP-III during 30th Dec. 2019 – 3rd Jan. 2020 at UCE, OU, Hyderabad, in association with VSSUT, Burla, Odisha.

Signature of Head of Institution (with seal)

Address for Correspondence:

- Dr. Y. Rameshwar, Department of Mathematics, UCE, OU, Hyderabad-07, Mobile No.: 8977241972, Email.: rameshwar@osmania.ac.in
- Prof. P. Ramesh Babu, Department of Mechanical Engineering, UCE, OU, Hyderabad-07, Mobile No.: 8121846858, Email.: pbmechou@yahoo.com

Program Venue: Department of Mechanical Engineering, UCE, OU, Hyderabad-07, Telangana.