



**FACULTY DEVELOPMENT PROGRAMME (FDP)**  
**ON**  
**HIGH PERFORMANCE COMPUTING (HPC) OF**  
**COMPUTATIONAL FLUID DYNAMICS PROBLEMS**  
**(24<sup>th</sup> - 29<sup>th</sup> December 2018)**

**Organized by**  
**E & ICT Academy, NIT Warangal**

**(Sponsored by Ministry of Electronics and Information Technology (MeitY), GOI)**

**Preamble:**

"Electronics & ICT Academy" was set up at NIT Warangal with financial assistance from MeitY, Gol. The jurisdiction of this academy is Telangana, Andhra Pradesh, Karnataka, Goa, Puducherry and Andaman & Nicobar Islands. This academy role is to offer faculty development programmes in standardized courses and emerging areas of Electronics, Information Communication Technologies, training & consultancy services for Industry, Curriculum development for Industry, CEP for working professionals, Advice and support for technical incubation and entrepreneurial activities.

This faculty development programme (FDP) is devoted to addressing the need to enhance the knowledge about the latest technologies pertaining to High Performance Computing of Computational Fluid Dynamics Problems.

**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 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.

**Major Course Contents:**

Module 1: Parallel computing fundamentals

- Massively parallel computing using MPI and OpenMP
- MPI - Message passing libraries
- Pthread

Module 2: High Performance Computing

- Historical perspective and introduction to HPC
- Different architectures and parallel programming models
- Domain decomposition method
- Communication between processors
- Solution of hyperbolic and elliptic model problems using MPI

- HPC Benchmarking & Performance analysis.

Module 3: High accuracy schemes and algorithms for HPC

- Spatial discretization schemes, compact schemes, spectrally optimized DRP schemes, two versus multitime level time integration schemes, metrics of scientific computing.
- Large Eddy Simulation (LES) of fluid flows using filters, numerical filters and their band limiting abilities, control of spurious q-waves and aliasing error, multidimensional filters.

**Faculty conducting this programme:**

The programme will be conducted by the faculty members from NIT Warangal; Academicians in the concerned field from IITs/NITs/IIITs are invited to deliver lectures in the programme. Speakers from industries are also expected to deliver as part of the course.

**Registration Fee Particulars:**

<b>Faculty and Research Scholars</b>	<b>Rs.2500/-</b>
<b>Faculty of SC/ST Category</b>	<b>Rs.1875/- (SC/ ST participants should submit the copy of their caste certificate to claim the concession along with application form)</b>
<b>Industry Participants</b>	<b>Rs.7500/-</b>

**SC/ST concession is only for faculty of mentioned states. Research Scholars are not eligible for SC/ST concession.**

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

<b>DD Details</b>	<b>Online Transfer Details</b>
<b>Demand Draft in favor of "Director, NIT Warangal" payable at any bank in Warangal</b>	<b>Account Name: Electronics &amp; ICT Academy NITW Account No: 62423775910 IFSC: SBIN0020149</b>

**Eligibility:**

The program is open to the Faculty of Engineering Colleges, MCA Colleges and other allied disciplines in India. Industry personnel working in the concerned /allied discipline can also attend.

**Accommodation:**

All the selected participants will be provided **FREE boarding & lodging** in the institute guest house. No TA will be paid for the participants

**How to apply:**

A filled in form of application in the prescribed format duly signed and sponsored by appropriate authorities (along with demand draft) should reach the coordinator by speed-post. It is also mandatory to send scanned application form and demand draft through e-mail to [hpcfd2018@gmail.com](mailto:hpcfd2018@gmail.com) in as selection will be intimated only through mail.

**Selection Criteria:**

Selection will be done based on first-come-first-serve basis to a maximum number of 50 (fifty). Additionally 10 participants from industry are allowed to participate. The list of selected participants will be intimated through e-mail. In case a candidate is not selected, the DD will be sent back. Candidates will be issued satisfactory certificates on successful completion of the course. Reservations are followed for selecting candidates as per GOI norms.

**Important dates:**

Last date (Application & DD)	<b>03/12/2018</b>
Selection List by E- mail	<b>05/12/2018</b>
Duration	<b>24/12/2018 to 9/12/2018</b>

**About NIT Warangal:**

**National Institute of Technology, Warangal** is the first among 17 RECs setup as joint venture of the Government of India and the state government. Over the years the college has established itself as a premier Institute imparting technical education of a very high standard leading to the B.Tech degrees in various branches of engineering, M.Tech. and Ph.D programs in various specializations. All B. Tech and M. Tech programmes of NIT Warangal are NBA accredited.



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1. Name :
2. Designation :
3. Institution :
4. Email :
5. DD No:                      Bank:                      Date:
  
- Amount:
6. Address for Correspondence:

**SPONSORSHIP CERTIFICATE**

Dr. /Mr. /Ms. .... is an employee of our Institute/Organization and is hereby sponsored to participate in the FDP on “**High Performance Computing of Computational Fluid Dynamics Problems**”, sponsored by Electronics & ICT Academy during 24<sup>th</sup> -29<sup>th</sup> December, 2018 at NIT Warangal.

Signature of Head of Institution  
(with seal)

7. Educational Qualification:
8. Subjects taught so far:

**Address for correspondence**

*Post your application form with DD to*

**Dr. H. P Rani,**  
**Associate Professor,**  
**Dept. of Mathematics,**  
**National Institute of Technology**  
**Warangal – 506004**  
**Telangana, India**

9. No. of refresher courses/workshops attended:
10. Experience (in years):  
Teaching:                      Research:                      Industry:

*E-mail the scanned copies of filled-in and duly signed application form along with DD to*  
[hpcbfd2018@gmail.com](mailto:hpcbfd2018@gmail.com)

11. Accommodation required:    YES / NO
  12. Do you belong to SC/ST :    YES / NO
- (If yes, please specify and attach a copy of caste certificate to claim the concession)

*For more details about Electronics & ICT Academy, NIT, Warangal, please visit: <https://nitw.ac.in/eict>*

**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.

*For more enquiries please contact:*

*Dr. H.P. Rani (or) Dr. Ch. Sudhakar*  
*Mobile: 9908143247      Mobile: 9440647945*

Signature of the Applicant

**Coordinators**

**Prof. Y.N. Reddy, Dr. H.P. Rani**  
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NIT Warangal—506 004  
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