

Workshop on

**Numerical and Computational Methods  
for Fluid – Solid Interaction Problems  
(September 27 - 28, 2018)**

*Jointly Organized by  
Department of Applied Mathematics  
Indian Institute of Technology (ISM), Dhanbad  
& Department of Mathematics  
BIT Sindri, Dhanbad*

**REGISTRATION FORM**

Name : .....

Designation : .....

Qualification : .....

Organization : .....

Address for Correspondence :  
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Tel. (O) .....(M) .....

E-mail: .....

DD Particulars/online transfer:

Amount .....No.....

Date .....Bank .....

Accommodation Required: Yes / No

Date:

Place:

Signature of the Applicant

Forwarded through Head of the Dept/ Institution

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Deptt. of Maths, BIT Sindri

**Dr S C Dutta**

HOD – CSE, BIT Sindri

**LIST OF SPEAKERS**

**Prof. Sanjay Mittal, IIT Kanpur**  
**Prof. B.V. Rathish Kumar, IIT Kanpur**  
**Prof. P.V.S.N Murthy, IIT Kharagpur**  
**Prof. G N Singh, IIT (ISM) Dhanbad**  
**Prof. M K Singh, IIT (ISM) Dhanbad**  
**Dr P S Rao, IIT (ISM) Dhanbad**

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**Dr. P S RAO, IIT (ISM)**

**Dr. Rabindra Sharma, BIT, Sindri.**



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**DEPARTMENT OF APPLIED MATHEMATICS  
INDIAN INSTITUTE OF TECHNOLOGY (ISM)  
DHANBAD**  
&



**Deptt. of Mathematics  
BIT, Sindri, Dhanbad, Jharkhand**

**Sponsored by  
TEQIP – III, Govt. of India.**

## INTRODUCTION

Scientific Computing involves numerical modelling and simulation of real life problems like computational fluids flows; porous media heat transfer, numerical weather prediction, image processing and so on. All these models require high precision numerical algorithms with huge computational recourses and demands high accuracy. Since the real life models are highly nonlinear due to its multi dimensional properties and abrupt variations due to external forces and solving these problems is the need of current research.

## ABOUT THE PROGRAM

The aim of the present program is to introduce the multi dimensional variables which influence the system for numerical simulations of real life applications that arise in petroleum industry, mine industry, Mechanical Seals, Machine Tool Ways, Piston Rings and so on. These real life problems are highly complex due to enhanced and abrupt variations in machinery that may be due to high heat or high friction etc. With the advent of data analysis numerical methods like finite difference numerical technique, finite element, finite volume, domain decomposition and so on. The course contents include:

- Numerical Modeling of Real Life Systems
- Data Analysis of Numerical Simulations
- Statistical simulations of real life systems
- Coupling Schemes for heat transfer models
- Efficient fluid –solid interaction simulations
- Shape optimization in particle analysis
- Open problems in fluid-structure interactions
- Enhanced oil recovery in Porous media
- Computational Fluid Dynamics
- Insulation Technology Data Analysis

- Load enhanced Modules of Machines.
- Super Computing Applications in industry

## ELIGIBILITY CRITERIA

The programme is aimed at Industry Scientists, Managers, Software Professionals, faculties of all disciplines of mathematics; science and engineering and Research scholars who wish to gain a basic and advanced understanding of the concepts involved and tools for numerics especially in fluid-solid interaction problems.

## REGISTRATION FEE

The following registration fee includes course kit, Breakfast, lunch & dinner tea & snacks for two days (with accommodation on twin sharing basis including 18% GST).

For Faculties:	Rs. 5000/-
Research Scholars and PG Students	Rs. 3000/-
Software and R&D Organizations	Rs. 6000/-

## Registration fee for IIT (ISM) faculty, JRF & M.Tech students .

For Faculties:	Rs. 1000/-
Research Scholars and PG Students	Rs. 500/-

The registration fee may be paid through Demand Draft (DD) drawn in favour of “Registrar, IIT (ISM) Dhanbad, payable at **Canara Bank, Saraidhela Branch, and Dhanbad**. Also on line transfer can be made to the Registrar (Project Account ),**CANARA Bank, Saraidhela Branch, Dhanbad, Jharkhand State**, A/C No: **0986101009746, IFSC Code: CNRB0000986, MICR Code: 826015003**. The filled in registration form along with the DD/online transfer receipt should be sent to.

**Dr. P S Rao , Coordinator**, Department of Applied Mathematics, Indian Institute of Technology (Indian School of Mines), Dhanbad – 826 004, Ph: 09471191351

**E-mail: pssrao@iitism.com**

**Last Date for Registration: 17<sup>th</sup> September, 2018**

## ABOUT THE DEPARTMENT

The Department of Applied Mathematics is a highly reputed Department which functions with excellence as its motto. The Department was started in the year 1926 along with other Engineering and Science Departments of the institute and has established itself as a dynamic centre for academic and research activities. In addition to the teaching of courses in Mathematics for B. Tech and M.Tech Programmes, the Department offers two P.G. Programs, M.Sc (Mathematics & Computing) and 5 Yr. Int. M.Tech (Mathematics and Computing). The faculty is actively engaged in research in diverse fields such as Solid Mechanics, Fluid Dynamics, Bio Mechanics, Operations Research, Cryptography and Analysis. At present, there are 21 members on the Teaching Faculty in the Department and more than 100 Research Scholars are working for their Ph.D. The Department has a full-fledged computation laboratory to meet the requirements of the M.Sc. students, research scholars and the faculty.

## ABOUT THE INSTITUTE

### IIT (ISM) Dhanbad

The Indian National Congress at its XVII Session of December 1901 passed a resolution stating that “in view of the fact that the tendency of recent legislation namely, The Indian Mines Act VII of 1901, is that all Indian mines must be kept under the supervision of mining experts, the Congress is of opinion that a Government College of Mining Engineering be established in some suitable place in India on the models of the Royal School of Mines in England, Mining Colleges of Japan and at other places in the continent”. The McPherson Committee formed by Govt. of India, recommended the establishment of an institution for imparting education in the fields of Mining and Geology, whose report, submitted in 1920, formed the main basis for establishment of the Indian School of Mines, Dhanbad. On 10<sup>th</sup> August, 2016 Gazettee of India notified the conversion of ISM into Indian Institute of Technology (ISM) under the Technology act of ministry of Human Resource development, Govt. of India. The institute has undertaken many workshops, short term courses funded by TEQIP. This is one of the events funded by TEQIP – III, Govt. of India.

### BIT Sindri

BIT, Sindri was started as College of Mechanical and Electrical Engineering in 1949. The institute grew and flourished rapidly during the early days under the dynamic leadership of Prof. D.L.Despande, the then Director, who is regarded as the architect of the institute. The institute is located at a distance of 28 kms from Dhanbad railway station linked by rail as well as road. It has a sprawling campus of about 450 acres of land near the eastern bank of river Damodar. The institute is fully residential for students as well as teaching and non-teaching staff.

The institute is controlled administratively by the Department of Higher, Technical Education & Skill Development, Govt. of Jharkhand. The main aim of the institute is to provide valuable human resources for the industry and society through excellence in technical education and research for sustainable development. The college offers B.Tech courses in 10 disciplines of engineering namely Mechanical, Electrical, Metallurgy, Production, Chemical, Electronics & Communications, Civil, Mining, Computer Science, Information Technology besides 10 M.Tech.Specializatn The college possesses modern amenities which include multimedia auditoriums, seminar rooms, class rooms, a state-of-the art well-stocked rich E-library, well-equipped modern laboratories and campus wide network & State of Art Siemens lab which is regarded as Centre of Excellence to meet the industry demand. The wide range of activities on campus, fully residential hostels, good sports facilities and never dying zeal of staffs and students for pursuit of excellence provides a pleasant and intellectually stimulating, proactive, conductive environment to students to feed their curiosities / interest and help them to prepare for the professional, academic and social life.