ABOUT NIT ROURKELA

National Institute of Technology Rourkela is an Institute of national importance created under the act of parliament. NIT Rourkela has been ranked as 225 and 29th position in QS Asia University and QS Indian University Ranking 2020, respectively. It has also been ranked in 121st position in QS BRICS category, 2020. Times Higher Education has figured NIT Rourkela in the group of 601-800 in World University Ranking 2020. The institute provides quality education in a diverse and multicultural environment. The mission of the institute is to become an internationally acclaimed institution of higher learning that will serve as a source of knowledge and expertise for the society and be a preferred destination for undergraduate and post graduate studies. The institute is offering undergraduate, post graduate and PhD programme in 21 branches of Engineering. The institute research centres are engaged in consultancy and research activities of several government bodies such as DST, DAE, CSIR, DRDO, BARC, ISRO and private industries.

DEPARTMENT OF MECHANICAL ENGINEERING

The Mechanical Engineering of NIT Rourkela comprises three divisions namely design, manufacturing and thermal engineering. The department is known for research in variety of fields that include mechanical vibration, robotics, heat transfer, CAD/CAM, precision engineering, metal forming, manufacturing, CFD, industrial refrigeration and cryogenics. The academic programmes of the department reflect not only the core areas of Mechanical Engineering; but also the research specialization of the faculty. The department at present has over one hundred research scholars pursuing the research on diverse fields. All the groups are working in close co-operation while retaining individual identities. Many Research and Development projects being pursued by the faculty are sponsored by Government agencies and private industries. The major sponsors among these projects are BRNS, DST, ARDB, BRFST and HBL Power Systems.

AICTE Training and Learning (ATAL) Academy
(Online Faculty Development Program)
on
Cutting-edge multidisciplinary research in the field of fluids

October 11 - 15, 2021
(Through Virtual Mode)
Patron
Prof. Simanchala Panigrahi, Director, NIT Rourkela
Chairman
Prof. S. K. Sahoo, HOD-ME Dept.
Conveners
Dr. Kishore Singh Patel, Prof S. Murugan
ME Dept.

Sponsored by

Organized by
Dr. Kishore Singh Patel (Convener)
Dr. B. Kiran Naik (Co-Convener)
Prof. S. Murugan (Co-Convener)
Department of Mechanical Engineering
National Institute of Technology, Rourkela
Rourkela -769 008, Odhisa

Contact Nos. 9945676486 (Kishore) 9435686059 (Kiran)
Emails: atalfdp2021fluids@gmail.com
          kishpatel.mech@gmail.com
          naikbk@nitrkl.ac.in

SPONSORSHIP / NOMINATION CERTIFICATE

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

is an employee of our institute and his / her application is hereby sponsored / nominated. The applicant will be permitted to attend the short-term course “Cutting-edge multidisciplinary research in the field of fluids” in Mechanical Engineering Department at NIT Rourkela during 11th-15th October 2021 if selected.

Our institute is (tick one):

☐ CFTI
☐ State Govt. Funded Institution
☐ Other Institutions

Date. ........................................ Signature of Authority
Designation

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

Organized by
Dr. Kishore Singh Patel (Convener)
Dr. B. Kiran Naik (Co-Convener)
Prof. S. Murugan (Co-Convener)
Department of Mechanical Engineering
National Institute of Technology, Rourkela
Rourkela -769 008, Odhisa

Contact Nos. 9945676486 (Kishore) 9435686059 (Kiran)

Emails: atalfdp2021fluids@gmail.com
          kishpatel.mech@gmail.com
          naikbk@nitrkl.ac.in
ABOUT THE COURSE

The fundamental shape of research in the field of classical fluid mechanics has changed a lot over a decade and has become truly multidisciplinary. The major focus of most of this work is to unravel complex flow physics involved in different multidisciplinary areas, such as biomedical, energy security, agriculture, soil engineering, climate change, etc. The focus of this program is to get a broader understanding of various cutting-edge research going on in the field of fluids.

COURSE CONTENT

The course will cover the following major topics:

- Introduction of fluid dynamical research in various multidisciplinary fields.
- Fluid dynamics in a biological system.
- Fluid dynamics inside a small confined channels (microfluidics).
- Fluid dynamics of clouds
- High speed flows
- Wall bounded turbulent flows
- Computational multiphase flows
- Meshless techniques in computations

TRAINING SESSION

The training session will cover the following topics:

- Machine learning tools, statistical techniques in the field of fluid flows and heat transfer
- CFD simulations using commercial software.
- Remote sensing applications to weather forecast
- Communicating Scientific Information to Public

ELIGIBILITY

The course is open to faculty members, research scholars and students from universities and educational institutions, and scientists and engineers from research organizations and industries, respectively. No course fee is charged for PhD and PG students.

IMPORTANT DATES

The last date for the receipt of applications by email: scanned copy is 06/10/21. Intimation of selection: 09/10/21

TARGET AUDIENCE

Maximum number of applicants is limited to 200. The selected applicants will be provided a secured meeting code of the web platform one day before the commencement of course.

ADDRESS FOR CORRESPONDENCE:

Dr. Kishore Singh Patel
Department of Mechanical Engineering
National Institute of Technology, Rourkela
Rourkela-769 008, Odhisa, India

Contact Nos. 9945676486 (Kishore)

Emails: patelks@nitrkl.ac.in; kishpatel.mech@gmail.com

REGISTRATION FORM

Registration for this program is free. However, the registration can only be done through AICTE Training And Learning (ATAL) portal. The steps to create an ATAL portal and registration for the course are as follows:

Step-1 If you are new to the ATAL Academy FDP portal, kindly sign it up as a participant using this link:- https://atalacademy.aicte-india.org/signup. The existing user can directly login to the portal to register for this FDP.

Step-2 After creating a participant portal on ATAL Academy, the login to the portal can be done using this link: - https://atalacademy.aicte-india.org/login

Step-3 The participants can see the list of upcoming online FDP by clicking to "Workshop" option in the left side column.

Step-4 As per interest, the participants can register for one or more FDP programs.

Step-5 To register for this FDP program, one can search by 1. State:- ODISHA, 2. Month:- October, 3. Thrust area:- All, and 4. Mode:- Online".

Step-6 After this one can see our FDP program in 3rd position, under the title "Cutting-edge multidisciplinary research in the field of fluids". By clicking the add (+) sign, one can register for this FDP.

If you need any other help, kindly contact us through the email:- atalfdp2021fluids@gmail.com Or k.bukke@gmail.com
# AICTE Training and Learning (ATAL) Academy

(Online Faculty Development Program)

on

Cutting-edge multidisciplinary research in the field of fluids

October 11\textsuperscript{th} to 15\textsuperscript{th}, 2021

<table>
<thead>
<tr>
<th>Day</th>
<th>Technical Session Theme</th>
<th>9:15 AM - 10:00 AM</th>
<th>10:15 AM - 12:15 AM</th>
<th>2:00 PM - 4:00 PM</th>
<th>4:15 PM - 6:15 PM</th>
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<td>Day 1</td>
<td>Microfluidics, Biofluid Mechanics</td>
<td>Inaugural Function</td>
<td>Lecture 1</td>
<td>Lecture 2</td>
<td>Lecture 3</td>
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<td></td>
<td>(11-10-2021) Monday</td>
<td></td>
<td>Prof. Suman Chakraborty Professor, (FRSC, ASME, FNASc, FNA Fellow) IIT Kharagpur</td>
<td>Prof. Rajesh Ranjan Assistant Professor, IIT Kanpur</td>
<td>Dr. Earu Banoth Assistant Professor, NIT Rourkela</td>
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<td>Day 2</td>
<td>Earth and atmospheric flows</td>
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<td>Lecture 4</td>
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<td>(12-10-2021) Tuesday</td>
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<td>Prof. Narsing Jha Assistant Professor, IIT Delhi</td>
<td>Dr. Samrat Rao Assistant Professor, IIT Jammu</td>
<td>Prof. S. Murugan Professor, NIT Rourkela</td>
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<td>Day 3</td>
<td>Miscellaneous (Bubble dynamics; LBM; Nanofluids)</td>
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<td>Lecture 7</td>
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<td>(13-10-2021) Wednesday</td>
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<td>Prof. Kirti Chandra Sahu Professor, IIT Hyderabad</td>
<td>Dr. N. H. Maruthi Senior software manager, Sankhya Sutra lab</td>
<td>Dr. B. Kiran Naik Assistant Professor, NIT Rourkela</td>
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<tr>
<td></td>
<td>Day 4</td>
<td>High Performance Computing</td>
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<td>Lecture 10</td>
<td>Lecture 11</td>
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<td>(14-10-2021) Thursday</td>
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<td>Prof. Ratnesh Shukla Associate Professor, IISc Bangalore</td>
<td>Prof. S. M. Deshpande DST Chair Professor (Rtd.), IISc Bangalore</td>
<td>Dr. K. S. Patel Assistant Professor, NIT Rourkela</td>
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<tr>
<td></td>
<td>Day 5</td>
<td>Biofluid Mechanics</td>
<td>Lecture 13</td>
<td>Lecture 14</td>
<td>Test, feedback, Vote of thanks, and formal closer of program</td>
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<td></td>
<td>(15-10-2021) Saturday</td>
<td></td>
<td>Prof. Amresh Dalal Professor, IIT Guwahati</td>
<td>Mr. Varun Upadhyay Institutional Collaborator, Art-of-living, Bangalore</td>
<td></td>
</tr>
</tbody>
</table>
Inaugural Function (11-10-2021)
09:20AM – 10:00AM

Welcome Address
Dr. Kishore Singh Patel
Assistant Professor, Mechanical Engineering Department
NIT Rourkela

Inaugural Address
Prof. S. K. Sahoo
HOD, Mechanical Engineering Department
NIT Rourkela

Address by the Director
Prof. Simanchala Panigrahi
Director, NIT Rourkela

Address by the Chief Guest
Prof. Suman Chakraborty
Professor (FRSC, ASME, FNASC, FNA Fellow)
IIT Kharagpur

Vote of Thanks
Dr. B. Kiran Naik
Assistant Professor, Mechanical Engineering Department
NIT Rourkela

LECTURE SERIES
DAY 1 (11-10-2021)

Lecture 1
10:15 AM

Topic: Fluid Dynamics and Human Health.

Speaker: Prof. Suman Chakraborty,
Professor (FRSC, ASME, FNASC, FNA Fellow)
IIT Kharagpur

Lecture 2
2:15 PM


Speaker: Dr. Rajesh Ranjan
Assistant Professor, IIT Kanpur

Lecture 3
4:00 PM

Topic: Development of microfluidic device using soft lithography

Speaker: Dr. Earu Banoth
Assistant Professor, NIT ROURKELA
**DAY 2 (12-01-2021)**

**Lecture 4**
*Topic:* Environmental fluid dynamics.
*Speakers:* Prof. Narsing Jha
Assistant Professor, Applied Mechanics Department, IIT Delhi.

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**Lecture 5**
*Topic:* Cloud dynamics.
*Speaker:* Prof. Samrat Rao
Assistant Professor, IIT Jammu

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**Lecture 6**
*Topic:* 
*Speaker:* Prof. S. Murugan
Professor, NIT Rourkela

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**DAY 3 (13-01-2021)**

**Lecture 7**
*Topic:* Bubbles and droplets.
*Speaker:* Prof. Kirti Chandra Sahu
Professor, Chemical Engineering Dept., IIT Hyderabad

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**Lecture 8**
*Topic:* DNS of flow past LPT cascade using a higher-order Lattice Boltzmann Model.
*Speaker:* Dr. Maruthi N.H.
Technical Lead, SankhyaSutra Labs Ltd., Bangalore

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**Lecture 9**
*Topic:* Assessment of heat transfer enhancement in evacuated U-tube solar collector employing nanofluids
*Speaker:* Prof. B. Kiran Naik
Assistant Professor, NIT Rourkela
DAY 4 (14-01-2021)

10:15 AM

Lecture 10
Topic: Simulations of multicomponent compressible flows.
Speakers: Prof. Ratnesh K. Shukla
Associate Professor, Mechanical Engineering, IISc Bangalore

03:15 PM

Lecture 11
Topic: Kinetic grid free method from research to applications and future directions of aerospace CFD in India.
Speaker: Prof. S. M. Deshpande
Redt Satish Dhawan Chair Professor, IISc, Bangalore
Was Senior Research Associate and Consultant, EMU, JNCASR, Bangalore, India
FASc, FNAE, FAeSI, Fellow Maharshtra Academy of Sciences.

4:00 PM

Lecture 12
Topic: High-fidelity simulation over an HPT blade and multiphase flow dynamics on a moving domain.
Speakers: Dr. Kishore Singh Patel
Assistant Professor, Mechanical Engineering, NIT Rourkela.

DAY 5 (15-01-2021)

10:15 AM

Lecture 13
Topic: Migration of Hydrogel Drug Carriers Through Narrow Passages and Flow Dynamics of Cancer Cells Through Constricted Microchannels
Speakers: Prof. Amaresh Dalal
Professor, Department of Mechanical Engg, IIT Guwahati,

02:15 PM

Lecture 14
Topic: Value addition and time management
Speaker: Mr. Varun Upadhyay
Institutional Collaborator, Art-of-living, Bangalore

04:15 PM

Brainstorming and Valedictory Function
ADDRESS OF CORRESPONDENCE

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National Institute of Technology, Rourkela
Odisha, India - 769008
Contact No. 9945676486 (Kishore)
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MS Teams Joining Link
https://teams.microsoft.com/l/team/19%3a3a23VZJrPjprofTLBSHlnAjeiJLQLXD-OGdrKesrswDw1%40thread.tacv2/conversations?groupId=44a75cea-d3f4-4ead-99cc-3bcafcfd91e4c&tenantId=bad12864-913e-4b99-87d6-b8d2ad459e27

Whatsapp Group link
https://chat.whatsapp.com/KYDePjXSnlE8sNUOVg5QT1

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Email: B.RAGHURAM202@gmail.com (B Raghu Ram), vinitmalik873@gmail.com (Vinit Malik)