

# A FIVE-DAY COMPREHENSIVE WORKSHOP ON FLUID FLOW AND HEAT TRANSFER RESEARCH

During  
16-20 July 2025  
(Online Mode)



To be organized by

Department of Mechanical Engineering  
National Institute of Technology  
Rourkela-769008, Odisha  
[www.nitrkl.ac.in](http://www.nitrkl.ac.in)

## ELIGIBILITY

Participation in this workshop is open to faculty members, early career faculty members, post-doctoral fellows, research scholars, PG/UG students, researchers from the research laboratory, personnel from R&D sectors, Industrial personnel/engineers, and any other interested personnel. The successful participants will be given a participation certificate.

## COURSE FEE

- Personnel from Industry and R&D units: **Rs. 1500/-**
- Faculties/ Research Scholars/ Students/ Technical staff members of academic institutions/ researchers from research laboratories: **Rs. 800/-**

## PAYMENT & REGISTRATION PROCESS

Please transfer the course fee amount to the bank account mentioned below.

Account name: CONTINUING EDUCATION NIT ROURKELA

Account No.: 10138951784

Bank name: State Bank of India

Branch name: NIT Campus Rourkela

IFS Code: SBIN0002109

UPI ID: 01389517841@sbi

Merchant Name:

CONTINUING EDUCATION NIT RKL



For the registration process, participants are required to opt for any of the two options mentioned below.

**Option 1:** Participants are required to fill out a Google form (<https://forms.gle/3wZXNPfgm59A3CCT6>), and a copy of the payment receipt is to be attached to the Google form.

**Option 2:** Participants are required to send a scanned copy of the filled Registration form (attached at the end of the brochure) along with a copy of the payment receipt to [ghoshsuman20003@gmail.com](mailto:ghoshsuman20003@gmail.com)

## Please note

- Registration is mandatory. Only registered members will be allowed to attend the Workshop.
- An incomplete registration form (without proof/online transaction details) will not be considered.
- The last date for registration is **15 July 2025**.
- The registration fee is non-refundable.
- There is no registration fee for the participants from the host institute (NIT Rourkela).
- E-Certificate will be provided for the candidates attending all the sessions.
- Online joining link(s) through **Google Meet/MS Team** will be shared in due course.

## PATRON

PROF. K. UMAMAHESHWAR RAO  
DIRECTOR, NIT ROURKELA

## CO-PATRON

PROF. SWADESH KUMAR PRATI HAR  
DEAN (SRICCE), NIT ROURKELA

## CHAIRMAN

PROF. SAROJ KUMAR PATEL  
HEAD, MECHANICAL ENGG. DEPT.

## COORDINATOR

DR. SUMAN GHOSH  
ASSOCIATE PROFESSOR  
DEPT OF MECHANICAL ENGG.

## CO-COORDINATOR

DR. JNANA RANJAN SENAPATI  
ASSISTANT PROFESSOR  
DEPT OF MECHANICAL ENGG.

## ADDRESS FOR CORRESPONDENCE

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NIT ROURKELA



NIT ROURKELA



## ABOUT NIT ROURKELA

National Institute of Technology Rourkela is one of the country's premier national-level institutions for technical education. The erstwhile Regional Engineering College (REC) Rourkela was converted to a deemed university and renamed as National Institute of Technology Rourkela on 26 June 2002. It was declared as an Institute of national importance through the Parliament Act on 15 August 2007. During the last decade, the Institute has made a rapid stride in earning a reputation as a place of higher learning in engineering and technology. NIT Rourkela provides quality education in a diverse and multicultural environment.



The mission of the Institute is to meet the needs of industry and commerce by providing human resources with the required knowledge and skills and also by promoting, disseminating, developing, and transferring technology. The Institute strives hard to become an internationally acclaimed institution of higher learning that will serve as a source of knowledge and expertise for society and be a preferred destination for undergraduate and postgraduate students along with advanced research. The vision of the Institute is to advance and spread knowledge in the area of science and technology, leading to the creation of wealth and welfare of humanity. The Institute offers undergraduate, postgraduate, and PhD programs in twenty-one branches of Engineering. The Institute's research centers are engaged in consultancy and research activities of several government bodies such as DST, DAE, CSIR, DRDO, BARC, ISRO, and private industries.

## NIT ROURKELA RANKINGS

- 2024:** Ranked 19 in NIRF Engineering, 30 in NIRF Research, and 34 in NIRF Overall category
- 2025:** Ranked 78 in QS Southern East-Asia University Rankings and 317 in QS Asia University Ranking
- 2025:** QS World University Sustainability Ranking - 2025 has placed NIT Rourkela at 664 in Overall category, 167 within Asia region, and 19 within India
- 2025:** Times Higher Education Ranking 2025 has placed NIT Rourkela at 801-1000 in World University Ranking, 601-800 in World University Ranking (Engineering), and 191 in Asia University Ranking

## ABOUT THE DEPARTMENT

The Mechanical Engineering Department of NIT Rourkela comprises three divisions, namely Design, Manufacturing, and Thermal Engineering. The department is known for research in a variety of fields, including fluid flow, heat

transfer, mechanical vibration, robotics, CAD/CAM, precision engineering, metal forming, manufacturing, CFD, industrial refrigeration, and cryogenics. The department's academic programs reflect not only the core areas of Mechanical Engineering but also the research specialization of the faculties. At present, the department has over one hundred research scholars pursuing research in diverse fields. All the academic groups work in close cooperation 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 of these projects are BRNS, DST, ARDB, BRFSST, and HBL Power Systems.

## ABOUT THE COURSE

The world is filled with engineering applications that use the principles of fluid mechanics and thermal systems — industrial and building energy efficiency, environmental turbulence and ecosystem dynamics, and climate change, to name a few. Thermo-fluid science and engineering is a critical discipline that underpins a wide range of modern technologies and systems, encompassing the study of heat transfer, fluid mechanics, and thermodynamics. It plays a vital role in designing and optimizing energy systems, including engines, HVAC systems, power plants, and renewable energy technologies such as wind turbines and solar collectors. By understanding how heat and fluids behave and interact, engineers can improve efficiency, reduce environmental impact, and develop innovative solutions to global challenges like climate change and energy scarcity. The principles of thermo-fluid science are also essential in aerospace, automotive, biomedical, and manufacturing industries, making it a foundational field for advancing technology and improving quality of life. In recent years, the development of numerical and analytic methods and various advanced experimental techniques for solving thermo-fluid problems have rapidly grown among the scientific community. Indeed, the wide variety of methods and techniques and their applications had a crucial impact on engineering, industry, chemistry, medicine, and many other fields. The workshop aims

- To gather experts to discuss building advanced numerical/ analytical/ experimental methods in the context of fluid mechanics & thermal systems research and to illustrate their use with concrete and real-life applications
- To serve as a platform for engineers/ scholars/ researchers working in thermo-fluid science and engineering to share opinions, experiences, best practices, and lessons gained



- To bring together experts and share the state-of-the-art experimental, numerical, and analytical methods in industrial R&D and fundamental research
- To provide practical experience and hands-on training on various flow and temperature visualization techniques
- To train the engineering students, young faculty members, research scholars, and industrial personnel on various advanced numerical and analytical schemes as well as experimental techniques
- To provide a systematic approach to developing an understanding of fluid mechanics and heat transfer research
- To offer a methodical approach to build insight into developing various in-house experimental facilities and instrumentation, as well as numerical and analytical methodologies for thermo-fluids research.

## WORKSHOP TRACKS

The workshop will cover but not be limited to the following topics

- **Drop dynamics:** Macro-meso-micro-hybrid techniques
- Supercritical fluids and their use as heat transport media
- **Supercritical natural circulation Loop:** A technology for the future
- Numerical modeling of mixing and slug flow heat transfer in micro-mixers
- **Electroosmotic flow in microchannels**
- Turbulent flow field reconstruction using physics-based neural network
- **Application of heat transfer in cryotherapy**
- Thermal management of lithium-Ion batteries: Cooling technique, design strategies, and performance optimization
- **Enhancement techniques of pool and flow boiling heat transfer**
- Enhancement techniques of flow condensation heat transfer

**Special attraction: Hands-on practice sessions on trending Thermo-fluid problems using Ansys Fluent by experts from Industry (Special training sessions will be delivered by experts from ARK Infosolutions Pvt. Ltd.)**

## STUDENT COORDINATOR

Prateek Debadarsi Roul (+91 9337839747)



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# REGISTRATION FORM

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## REGISTRATION FORM USING OPTION 2

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1. Honorific/Title: \_\_\_\_\_ (Prof./Dr./Mr./Ms./Mrs.)
2. Name: \_\_\_\_\_
3. Designation: \_\_\_\_\_ (Faculty/Student/Industry Professional /Other)
4. Name of the Institution/Organization/Industry : \_\_\_\_\_
5. Email ID (Provide the email ID that you will use to log in to MS Teams when joining the program) : \_\_\_\_\_
6. Mobile Number (WhatsApp): \_\_\_\_\_
7. Payment ID (Transaction ID): \_\_\_\_\_
8. Bank/Branch/UPI ID Details: \_\_\_\_\_
9. Date of payment : \_\_\_\_\_
10. Signature of the Applicant with Date: \_\_\_\_\_

(The scanned copy of the filled registration form along with the payment receipt should be emailed to [ghoshsuman20003@gmail.com](mailto:ghoshsuman20003@gmail.com))