

## 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, BRFSST and HBL Power Systems.

### ABOUT THE COURSE

With the rapid advancement of electric vehicles and energy storage systems, the importance of battery thermal management has grown significantly. This program aims to provide a deeper understanding of thermal, structural, and safety aspects of batteries using advanced simulation tools like ANSYS Fluent, Fluent Meshing, and LS-DYNA. The focus is on modeling and analyzing battery cells and packs (prismatic and cylindrical), cooling techniques, thermal abuse scenarios, and reduced-order modeling approaches. The course also highlights cutting-edge research in battery safety, heat transfer, and real-time simulation methods relevant to modern energy systems.

### Coordinators

**Dr. Jnana Ranjan Senapati**  
**Dr. Sushil Kumar Rathore**

**Department of Mechanical Engineering**  
National Institute of Technology, Rourkela  
Rourkela -769008, Odisha

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## ABOUT NIT ROURKELA

National Institute of Technology Rourkela is an institute of national importance created under the act of parliament. NIT Rourkela provides quality education in a diverse and multi-cultural 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 both UG and PG studies. The vision of the institute is to advance and spread knowledge in the area of science and technology leading to creation of wealth and welfare of humanity.

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.

### NIT ROURKELA RANKINGS

Source: <https://nitrrkl.ac.in/About/Rankings>

2024	Ranked 19 in NIRF Engineering
2024	Ranked 34 in NIRF Overall
2024	Times Higher Education World University Ranking 2023 has placed NIT Rourkela at 801-
2023	Ranked 59 in QS Southern Asia University Rankings
2023	Times Higher Education World University Ranking 2023 has placed NIT Rourkela at 1000-1200
2022	Ranked between 801-1000 in THE World University

**A  
FIVE DAYS  
SKILL DEVELOPMENT WORKSHOP  
on**

**LEARNING  
BATTERY THERMAL MAN-  
AGEMENT SYSTEMS  
(BTMS) USING  
ANSYS FLUENT**

**May 12-16, 2025  
(Online Mode)**

**Patron**

**Prof. K. Umamaheshwar Rao,  
Director, NIT Rourkela**

**Chairman**

**Prof. S. K. Patel, HOD-ME**

**Principal Coordinator**

**Dr. Jnana R. Senapati, ME**

**Convener**

**Dr. Sushil K. Rathore, ME**



**Department of Mechanical Engineering  
National Institute of Technology  
Rourkela-769008**



**NIT RKL**



**NIT RKL**



## COURSE CONTENT & TRAINING SESSION

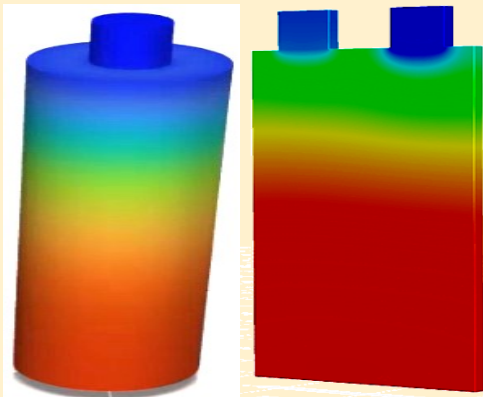
The course will cover the following major topics;

- **Battery Thermal Management** – Basics & Importance
- **Modeling & Meshing** – Single Cell (Prismatic & Cylindrical) & Battery Pack
- **Cooling Techniques & CHT Analysis** – Single Cell & Battery Pack
- **Structural & Thermal Abuse Analysis** – FEA, Indentation Test, LS-DYNA
- **Thermal Runaway & Propagation** – Single Cell & Battery Module
- **ECM & MSMD Battery Analysis**
- **Reduced Order Modeling (ROM)** – LTI & SVD ROM for Battery Cells & Modules

## HANDS-ON SESSION BY EXPERT

### FROM INDUSTRY

Special training session will be going to delivered by expert from ARK Infosolutions Pvt. Ltd.



## ELIGIBILITY

Participation in this workshop is open to Post Doctoral Fellows, Research Scholars/ PG/ UG students and Faculty of recognized technical institutes, Researchers from the research laboratory, Industrial Person/Engineers and any other interested personnel. The successful participants will be given a participation certificate.

## IMPORTANT DATES

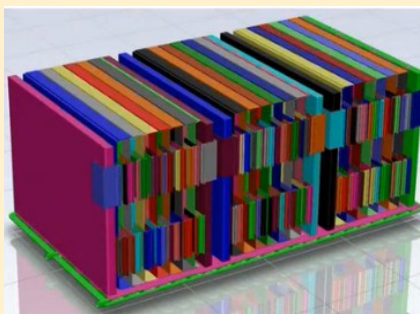
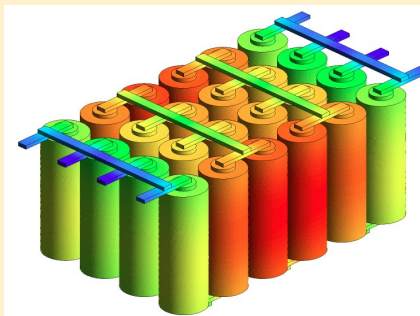
The last date for the registration is 11/05/25.

## TARGET AUDIENCE

The applicants will be provided a secured meeting code of the web platform before the commencement of course.

## ADDRESS FOR CORRESPONDENCE:

Dr. JNANA RANJAN SENAPATI  
Department of Mechanical Engineering  
National Institute of Technology, Rourkela  
Rourkela-769008, Odisha, India  
Contact No. +91-9547147576  
Email-id: [senapatijr@nitrkl.ac.in](mailto:senapatijr@nitrkl.ac.in)



## COURSE FEE

- Students: 1000/-
- Academic faculties: 1500/-
- Industry professionals: 2000/-

\* **INCLUSIVE OF GST**

## REGISTRATION FORM

For registration use the following link:  
<https://forms.gle/UPcAdrucSKyjs3QbA>

## MODE OF PAYMENT: (ONLINE ONLY)

Please transfer the Fee amount to the following bank account (details given below). Attach the payment receipt along with the google form for registration ([link mentioned above](#)).

Name: CONTINUING EDUCATION NIT  
ROURKELA

Acct. No.: 10138951784

Bank: State Bank of India

Branch: NIT Campus Rourkela

IFS Code: SBIN0002109



UPI ID: 01389517841@sbi

Merchant Name : Continuing Education NIT

Online certificates will be given to the participants who attend all sessions of the course.

## FOR FURTHER ASSISTANCE

Student coordinators:

Prateek (+91-9337839747)

Durgaprasad (+91-8517015088)