Course Content

1 Industry 4.0
Introduction to Industry 4.0: AI and Machine Learning, Industrial IoT network, Big data, Robotics & Mechatronics.

2 Additive Manufacturing
Rapid prototyping, Rapid tooling & 3D printing, Polymer, metal and composite AM, Microstructure & property characterisation, Aspects of postprocessing.
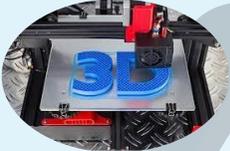
3 Advanced Manufacturing
Microwave material processing such as drilling, curing, melting, etc, UAFM, ECDM, LBM, etc.

4 COMSOL Multiphysics
Geometry, mesh, physics setup, solver setting, post-processing, example of manufacturing.

Key focus areas

3D Printing

Artificial Intelligence

COMSOL MULTIPHYSICS®

Microwave Material Processing

COMSOL Multiphysics

Scan/Click to register

[QR code]   or   **Registration Link**

Organizing Committee

Patron

Prof. K. Umamaheshwar Rao
Director, NIT Rourkela

Chairman

Prof. Saroj Kumar Patel
Professor & HoD
Department of Mechanical Engineering, NIT Rourkela

Coordinator

Dr. Gaurav Kumar
Assistant Professor
Department of Mechanical Engineering, NIT Rourkela

&

Dr. Saurav Datta
Associate Professor
Department of Mechanical Engineering, NIT Rourkela

Contact Details

Dr. Gaurav Kumar
Department of Mechanical Engineering
National Institute of Technology,
Rourkela, Odisha, India
Ph. No.: +91 8791675692
Email: kumarg@nitrkl.ac.in

G20 भारत 2023 INDIA

75 आज़ादी का अमृत महोत्सव

Five-Days National Workshop

on

Sustainable Manufacturing & Industry 4.0:
Special emphasis on 3D printing & microwave material processing
(SMI 4.0)

during
01ˢᵗ July – 05ᵗʰ July 2024
(Virtual Mode)

Organized by

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

NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

About NIT Rourkela

The erstwhile Regional Engineering College (REC) Rourkela converted into National Institute of Technology, Rourkela in 2002, becoming a beacon of technical education in India. It was declared as "An Institution of National Importance" through the parliament act on 15th August 2007. NIT Rourkela offers education in 21 branches of Engineering, spanning undergraduate, postgraduate, and PhD programs with a focus on undergraduate and postgraduate excellence, industry collaboration, and robust research endeavors. Renowned for its excellence, NIT Rourkela ranked 601-800 globally in the Times Higher Education World University Rankings 2024 and secured the 67th position in Southern Asia. Nationally, it stood 16th among engineering colleges as per NIRF 2023. Committed to industry needs, it fosters a multicultural environment, nurturing talent and promoting technology transfer. With a mission to become an internationally acclaimed center of learning, NIT Rourkela aims to serve society as a knowledge hub and preferred destination for students and researchers alike.

About ME Department

The Mechanical Engineering Department of NIT, Rourkela is known for research in diverse fields. The main foci of research are mechanical vibration, robotics, CAD/CAM, precision engineering, metal forming, Machining, CFD, Industrial refrigeration and Cryogenics. The academic programme of the department reflects 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 projects in diverse fields. The faculty is organized into three divisions i.e., thermal, design and production engineering and six groups. 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. Some of the major sponsors are BRNS, DST, DAE, CSIR, DRDO, BARC, ISRO and private industries.

About the Workshop

The era of Industry 4.0 heralds a transformative shift in manufacturing, driven by technological innovations, automation, and the integration of cyber-physical systems. At the heart of this revolution lies the convergence of Artificial Intelligence (AI) and Machine Learning (ML), empowering manufacturers with predictive analytics, adaptive control, and autonomous decision-making capabilities. Additive Manufacturing (AM) stands as a cornerstone of Industry 4.0, revolutionizing production paradigms through layer-by-layer fabrication techniques. Recent advancements in AM technologies coupled with sophisticated software solutions for part generation and slicers have accelerated its adoption across diverse industries.

In parallel, Advanced Manufacturing techniques such as Microwave Material Processing have emerged as frontrunners in sustainable and energy-efficient production methodologies. Manufacturing methods like Ultrasonic Assisted Abrasive Flow Machining (UAFM), Electrochemical Discharge Machining (ECDM), Laser Beam Melting (LBM), microwave curing, microwave drilling, microwave melting, etc. have showcased remarkable potential in enhancing product quality and process efficiency.

The workshop intends to address aspects of various additive manufacturing processes and advanced manufacturing techniques, focusing on research endeavours conducted in these domains to address associated opportunities and challenges. The workshop will also offer hands-on experience with practical manufacturing examples using COMSOL Multiphysics. This software provides a unified platform for simulating multiphysics phenomena, showcasing its ability to optimize designs, enhance efficiency, and drive innovation within the Industry 4.0 landscape.

Academicians from premier institutions like IITs, NITs, State/ Centrally Funded Universities, experts from Industries as well as R&D Organizations having expertise and experience in relevant domain knowledge are to be invited as Resource Person for this workshop.

Eligibility

The workshop is open for faculty members, research scholars, UG/ PG students, technical staff members of educational institutions, personnel from R&D sectors/ research laboratories & Industry.

Important details

Course Fee (Including GST)
Faculties/ Research Scholars/ Students/ Technical Staff Members from academic institute: **Rs. 300/-**
Personnel from Industry and R&D units: **Rs. 1000/-**

Online Payment Details
Account Name: CONTINUING EDUCATION NIT ROURKELA
Payable Bank/ Branch: SBI, NIT Campus, Rourkela-769008
Account No.: **10138951784**
IFSC Code: SBIN0002109
MCIR No.: 769002007
SWIFT Code: SBININBB137

Certificate
E-Certificate will be issued upon participation in all the sessions.

Last date of registration: 26/06/2024