

DEPARTMENT OF MECHANICAL ENGINEERING



A Five-Day Karyashala High-End Workshop on

Biomass and Waste Based-CCHP Applications

19-23 December 2022

National Institute of Technology, Rourkela
Odisha, India

Sponsored By



PATRON



Prof. K. Umamaheswar Rao

Director
NIT Rourkela

CHAIRMAN



Prof. S. K. Sahoo

Head
Department of Mechanical Engineering
NIT Rourkela

CONVENER



Prof. S. Murugan

Professor
Department of Mechanical Engineering
NIT Rourkela



ABOUT NIT ROURKELA

National Institute of Technology Rourkela is an institute of national importance created under the act of parliament. QS-World University-Asia Rankings has figured NIT Rourkela in the list of 271-280 in 2022. NIT Rourkela is the only NIT to appear in the top 980 universities in the world. THE (The Higher Education) World University Rankings has listed NIT Rourkela in 801-1000 in the year 2022. 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 society and be a preferred destination for undergraduate and graduate studies. The institute is offering Ph.D. and M.Tech by Research programme in 21 branches of Engineering. The institute's research centers are engaged in consultancy and research activities of several bodies such as DST, DAE, CSIR, DRDO, BARC, ISRO, and private industries.

RANKINGS

2022

- Ranked between 271-280 in QS-World University ASIA Rankings
- Ranked between 801-1000 in THE World University

2021

- Ranked between 201-250 in THE Emerging Economies
- Ranked between 601-800 in THE World University Ranking by Subject (Engineering)
- Ranked between 601-800 in THE World University Ranking by Subject (Physical Sciences)
- Ranked 250 in QS Asian University
- Ranked between 401-600 in THE IMPACT Ranking
- Ranked 41 in NIRF Overall

DEPARTMENT OF MECHANICAL ENGINEERING

The Mechanical Engineering Department of NIT, Rourkela is known for research in most of these fields. The main foci of research are on mechanical vibration, robotics, CAD/CAM, precision engineering, Metal forming, manufacturing, CFD, Industrial refrigeration and Cryogenics. The academic program of the department reflects not only the core areas of Mechanical Engineer 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 under three divisions and six groups. All the groups are working in close co-operation while retaining individual identities.

Many Research and Development projects are being pursued by the faculty are sponsored by Government agencies and private industries. Among the major sponsors are ARDB, CSIR, BRNS, DBT, DST, HBL Power Systems, and Lechier India Private Limited.



ABOUT THE COURSE

Sustainable development is a major focus of the world today to meet human development goals and sustain natural resources and ecosystem services on which the economy and society depend. According to the United Nations (UN) Sustainable Development Goals (SDGs) adopted by all UN Member States in 2015, affordable and clean energy and climate actions are important for achieving a cleaner environment. For obtaining cleaner energy, utilization of renewable energy sources as much as possible for different applications is encouraged. Although solar, wind, and hydropower are cleaner sources, biomass is also important for sustainable development. Biomass is an inevitable renewable substance largely available in various forms such as agricultural residues, forest residues, wood residues, industrial wastes, domestic wastes, and municipal wastes in the world. It can be used as a carbon-neutral or low carbon pollutant fuel for producing cooling, heat, and power.

Biomass can be converted into fuels or energy and used for generating heat, cooling, and power by adopting different methods. In recent years, the application of biomass in cooling, heating, and power has been very much visible in industries and communities in the world. The utilization of biomass for cooling, heating, and power applications is expected to increase soon and has huge potential in research and development. On the other hand, municipal wastes and industrial wastes can also be used for producing cooling, heating, and power applications. In this context, this International workshop aims at creating awareness in the research community and users by providing a lecture series in which experts from India and abroad will share their expertise in the area of biomass utilization in cooling, heating, and power applications.

COURSE CONTENT

The workshop will focus to share the knowledge of the experts in the following major areas;

- **Biomass conversion processes, characterization of feedstock and products**
- **Current and next-generation biofuel production**
- **Biomass for cooling applications**
- **Biomass for heating applications**
- **Biomass for power applications**
- **Biomass materials for CO₂ capture in power plants**
- **Waste to energy for CCHP applications**

TRAINING SESSION

Training will be given to participants on production of various biofuels. Demonstration and training will be provided on different sophisticated instruments such as FTIR, TGA-DTA, SEM, EDS etc.

Training on ASPEN software will also be provided to participants.

SPEAKERS



Prof. Sai Gu
University of Warwick



Prof. Jacek Hunicz, Lublin
University of Technology Poland



Prof. Maciej Mikulski
University of Vaasa
Finland



Prof. Rameshprabu Ramaraj
Maejo University
Thailand



Prof. A. Ramesh
IIT Madras



Prof. A.K. Agarwal
IIT Kanpur



Prof. V. S. Moholkar
IIT Guwahati



Prof. Pankaj Kalita, IIT
Guwahati



Prof. Thallada Bhaskar,
CSIR-IIP Dehradun



Prof. G. Nagarajan
Anna University, Chennai



Prof. R. Saravanan
Anna University,
Chennai



Prof. P. C. Shukla
IIT Bhilai
Bhilai



Prof. Abanti Sahoo
NIT Rourkela



Prof. P. Balasubramanian
NIT Rourkela



Prof. Sachin Kumar
Central University of
Jharkhand



Prof. S. Murugan
NIT Rourkela



ELIGIBILITY FOR PARTICIPATION

Karyashala is open to postgraduate and PhD students from Institutes, Colleges, and Universities in India. Applicants pursuing PG/PhD programs in any discipline of Biotechnology, Chemical Engineering, Energy Engineering, Mechanical Engineering, Metallurgy Engineering and related departments are eligible. Students who have recently completed their PG programs are also eligible. Candidates who have completed PhD will not be considered. Total numbers of seats are limited to 25. There is no registration fee. As External Participants are limited to 25, participants will be shortlisted by First cum-First Serve Basis and TA will be provided as per GOI norms. The Registration Form is given at the last page of the Brochure. Applicants are required to send the scanned filled-in-Registration Form which is duly signed by the applicant's competent authority to murugans@nitrkl.ac.in / recmurugan@gmail.com.

ACCOMMODATION AND TA

All the shortlisted participants will be provided free accommodation in the institute. The details of accommodation will be communicated to all the shortlisted participants. TA will be provided as per GOI norms.

PARTICIPATION CERTIFICATE

Certificates will be issued to only those participants who will have a minimum of 90% attendance in the workshop.

IMPORTANT DATES

The last date for submission of application by email	: 02-12-2022
Intimation of selection by email	: 09-12-2022
Workshop	: 19-23 December 2022

ADDRESS FOR CORRESPONDANCE

Prof. S. Murugan

Department of Mechanical Engineering

National Institute of Technology, Rourkela

Odisha State, India, Pin code: 769008

Email ID: murugans@nitrkl.ac.in ; Mobile : 9437140949

FOR ANY QUERIES CONTACT

Mr. Thota Bhaskara Rao (WhatsApp : 8106664005)

Mr. R. Maniarasu (WhatsApp: 7667518012)

Mr. Y. Nandakishora (WhatsApp:8762793589)





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on**



**Biomass and Waste Based-CCHP Applications
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Registration Form

Name of the applicant : **Dr./Mr./Ms./**

Designation :

Department :

Category : PG Student/Research
Scholar/Faculty/Scientist/Others

Organization :

Type of Organization : CFTI /Central Government/State Government/Others

Address for Communication :

Email :

Mobile and WhatsApp Number :

Tentative Date and Time of Arrival :
at Rourkela

Tentative Date and Time of Return :
from Rourkela

Signature of Applicant with Date :

Signature of Head of the :
Department with Date

Signature of Head of the :
Institution with Seal