



This short-term course is specially designed and framed taking into account the recent trends of hybrid microgrid infrastructure, its energy management along with inclusion of different renewable energy sources and storage systems into the electric grid. The key challenges in microgrid are supply and demand side management considering the uncertainties in generations and loads. Particularly the course describes general concepts and application, control strategies and power management of hybrid microgrid. In addition, it discusses the power quality issues, voltage and frequency control. Emphasis is also given for improving reliability and economic performance of microgrid, focusing on different MPPT and power sharing control algorithms. Moreover, major emphasis is given to experimental or test bed design and validations of hybrid microgrid performance having various distributed energy sources (DERs) and storage systems. The course is applicable for students and researchers from power system, power electronics and control system area who want to do research in fast growing and emerging renewable energy technology. Also, it will be suitable for engineering professionals from academia, R&D organizations as well as industries.

### Course Coverage:

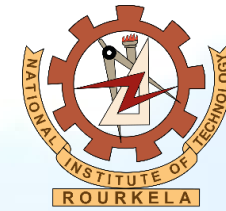
- Design, Development and Coordinated Control of a Wind Energy Assisted LVDC Microgrid.
- Adaptive Control of Microgrid
- Optimised Operation of a Solar, Battery, Diesel Engine and Grid Connected Microgrid with Energy Sales to the Utility: A Case Study for the Microgrid at Sumanadasa Building, University of Moratuwa, Sri Lanka.
- Power Management Scheme in a PV Integrated DC Microgrid.
- Design of Switching Converters and Power Management for Microgrid Application.
- Renewable Energy and Energy Storage towards Sustainable Living.
- Novel Protection Scheme for AC/DC Microgrid
- Sizing of Energy Storage in Electric Vehicles
- MPPT Algorithms
- Design of Switching Converters and Power Management for Microgrid

### Lab Sessions:

- Development of Wind Turbine Emulator for Wind Energy Conversion System (WECS).
- Power Management Scheme in a PV Integrated Hybrid AC/DC Microgrid.
- Design, Implementation and MPPT Control of PMSG based WECS.

### Key Speakers:

- Prof. Bidyadhar Subudhi, Director, NIT Warangal
- Prof. WDAS Waypala, University of Moratuwa, Sri Lanka
- Prof. Biswajit Ghosh, Vice Chancellor, The Neotia University, Kolkata
- Prof. Premalata Jena, IIT Roorkee
- Prof. Munmun Khanra, NIT Silchar
- Prof. B. Chitti Babu, IIITD&M Kancheepuram
- Prof. Pravat Kumar Ray, NIT Rourkela
- Prof. Monalisa Pattnaik, NIT Rourkela
- Prof. Arnab Ghosh, NIT Rourkela
- Prof. Susovon Samanta, NIT Rourkela
- Prof. S. Gopalakrishna, NIT Rourkela
- Prof. Indrajit Sarkar, NIT Rourkela



## National Institute of Technology Rourkela

### Hybrid Mode Short Term Course & Faculty Development Programme On

### SUSTAINABLE TECHNOLOGIES & ENERGY MANAGEMENT OF HYBRID MICROGRID (STEMM-2023)

12<sup>th</sup> - 16<sup>th</sup> July 2023  
(Hybrid Mode)

#### *Coordinators*

Prof. Monalisa Pattnaik  
Prof. Pravat Kumar Ray  
Prof. Arnab Ghosh

#### *Organized By*

Centre of Excellence on  
Renewable Energy Systems  
Dept. of Electrical Engineering  
National Institute of Technology  
Rourkela, Odisha - 769008

#### Technically Co-sponsored by:





## Introduction:

The global ratification regarding the usage of sustainable energy resources such as solar, wind, biomass and fuel cell etc. is propelled by the intent to substantially diminish carbon footprint, curtail dependence on fossil fuels and fulfil the escalating energy demand. The level of commitment towards sustainability and energy transition varies from region to region. To achieve these ambitious goals the development of smart and cost-effective microgrid technologies for power generation is necessary. Microgrid offers a decentralized approach to power generation, allowing for the integration of DERs and energy storage systems (ESS) to feed the load through suitable power electronic converters. With its ability to operate independently, microgrid can provide localized energy solutions and increase power resilience, particularly in remote areas not served by the central grid. Government is providing incentives and subsidies to encourage the adoption of sustainable technologies. Hence, the deployment of microgrid is being accelerated by technological breakthroughs and decreasing cost of solar panels, batteries, and semiconductor devices.

## Online Registration Form:

[https://docs.google.com/forms/d/e/1FAIpQLSd4FDt3VT4k3yfnjiaPiGyE69Rm9aP9Z86AO98YJpOEi\\_3PQ/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSd4FDt3VT4k3yfnjiaPiGyE69Rm9aP9Z86AO98YJpOEi_3PQ/viewform?usp=sf_link)

## Online Account Details:

**Account No:** 10138951784  
**Account Name:** CONTINUING EDUCATION  
 NIT ROURKELA  
**IFSC No:** SBIN0002109  
**Branch:** State Bank of India, NIT Campus  
 Rourkela

## About the Institute:

The course will be organized by the Centre of Excellence on Renewable Energy Systems at the National Institute of Technology (NIT), Rourkela. It is one of the premier national level institutions for technical education in the country and is funded by the Government of India.

Please visit <https://www.nitrkl.ac.in/>

37 NIRF Overall	16 NIRF Engg.	29 NIRF Research	281-290 QS Asia
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## About the Department:

The department of Electrical Engineering is established with the vision to design technologies and nurture technologists for diverse and sustainable growth in electrical engineering, leading to wealth and welfare of humanity. The department offers various UG and PG programmes with the mission to develop a platform for forging students as technocrats in line with cutting-edge academic, research and modern industrial practices, and enhancing their aptness in any technical sectors across the globe.

Please visit <https://website.nitrkl.ac.in/EE/>

## Registration Details:

Category	Online Registration Fee in INR	Offline Registration Fee in INR
Research Scholars/ PG / UG Student	500/-	5000/- (Accommodation Extra)
Faculty from Engineering Institutes	600/-	
Engineers from Industry and R&D Organizations	700/-	
Foreign Delegates	250 USD	
<b>No registration fee for students / staffs of NIT Rourkela</b>		

## Important Dates:

**Registration Deadline: Extended till 10<sup>th</sup> July 2023**

**Short-term Course Date: 12<sup>th</sup>-16<sup>th</sup> July 2023**

## Contact us:

**Dr. Monalisa Pattnaik**  
**Associate Professor**

Ph: 0661-2462423(O), 8895381976

Email: pattnaikm@nitrkl.ac.in ,  
 monalisa.pattnaik@gmail.com

**Dr. Pravat Kumar Ray**  
**Professor**

Ph: 0661-2462412(O), 9337031556

Email: rayp@nitrkl.ac.in,  
 pravatkumar.ray@gmail.com

**Dr. Arnab Ghosh**  
**Assistant Professor**

Ph: 0661-2462417(O), 9433379717 (M)

Email: ghosha@nitrkl.ac.in,  
 aghosh.ee@gmail.com

**Dept. of Electrical Engineering**  
**National Institute of Technology**  
**Rourkela – 769008, Orissa.**