



ACCELERATE  
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Azadi Ka  
Amrit Mahotsav

**One Week KARYASHALA**

**on**

**High-End Workshop on Modelling  
& Analysis of Communication  
Assisted Resilient Smart Microgrid**

**17<sup>th</sup> – 23<sup>rd</sup> March, 2024**

**Organised by**



Department of Electrical and Electronics Engineering  
NATIONAL INSTITUTE OF TECHNOLOGY  
TIRUCHIRAPPALLI  
Website: [www.nitt.edu](http://www.nitt.edu)

## ABOUT NIT TRICHY



National Institute of Technology Tiruchirappalli (NIT-T), formerly known as Regional Engineering College, Tiruchirappalli (REC-T) is one of the technical institutes started by the Government of India. REC-T was imparting quality education since its inception. In 2003, the institute has been granted “Deemed to be University” status with the approval of UGC/ AICTE. The college has been conferred with autonomy in financial and administrative matters to achieve rapid development. NIT-T was registered under Societies Registration Act XXVII of 1975. The College has a total campus area of 800 acres. With the cream of engineering and management talent, encompassing exuberant students and inspiring faculty, integrated with state-of-the-art infrastructure facilities, NIT-T today has emerged as one of the premier institutions in the country. NIT Tiruchirappalli retained its No. 1 position among all NITs, 7<sup>th</sup> year in a row in the “India Rankings 2022” released by NIRF.

## ABOUT EEE DEPARTMENT

The department of Electrical and Electronics Engineering, National Institute of Technology Tiruchirappalli offers an undergraduate program,

post-graduate programs (power systems and power electronics) and research degrees (M.S and Ph.D.) in various fields of Electrical Engineering. The department is recognized for excellence in teaching, research and service to the profession. The department has very well-established laboratories with sophisticated equipment supplementing the academic and research needs of students and research scholars.

## ABOUT KARYASHALA SCHEME

KARYASHALA is a program offered by the Science and Engineering Research Board (SERB), Government of India, via Accelerate Vigyan scheme to boost Research & Development in the country by enabling and grooming potential PG and Ph.D. level students by developing dedicated research skills in selected areas/disciplines through high-end workshops. This program aims to provide opportunities to acquire specialized research skills.

## PATRON

**Dr. G Aghila**  
Director, NIT Tiruchirappalli

## CONVENER

**Dr. M P Selvan**  
HoD/EEE, NIT Tiruchirappalli

## PROGRAM COORDINATOR

**Dr. Ankur Singh Rana**, Assistant Professor/EEE  
**Dr. Aneesa Farhan M A**, Assistant Professor/EEE  
**Dr. S Kayalvizhi**, Assistant Professor/EEE  
NIT Tiruchirappalli-620015, INDIA

## COURSE MOTIVATION

Power system is undergoing ground breaking changes, like conventional one way power flow is becoming two way with the involvement of renewable energy resources (RER). Electric power penetration and the intermittency due to RER started posing lot of challenges in front of the protection engineers to maintain the resiliency and sustainability of power system specifically from distribution power system side. Also the introduction of RER require more liberalized markets which needs more competitive operation with the existing assets. The proper coordination of RERs and load will be called as smart microgrid (S $\mu$ G). S $\mu$ G system has increased the reliability of power system, it contributes the reduction of system losses, will provide the improved power quality at the same time the necessary conditions for increasing the connection capacities for different distributed generation technologies.

S $\mu$ G will provide various benefits over conventional grids:

- ❖ S $\mu$ G will improves electric reliability
- ❖ S $\mu$ G will enhances resilience/recovery
- ❖ S $\mu$ G will improves the environment and promotes clean energy
- ❖ S $\mu$ G will strengthens the central grid
- ❖ S $\mu$ G will bolsters cybersecurity
- ❖ S $\mu$ G will brings economic value to society
- ❖ S $\mu$ G will improves community well-being

## COURSE SCOPE & OBJECTIVE

Microgrid ( $\mu$ G) is defined as a group of interconnected loads and distributed energy resources (DERs) within clearly defined electrical boundaries that act as a single

controllable entity with respect to grid. For maintaining the proper boundaries, continuous monitoring of  $\mu$ G is required. For continuous monitoring a proper communication infrastructure is required, which will enhance the spacing for maintaining the resiliency of the  $\mu$ G. This communication assisted  $\mu$ G is broadly called as Smart Micro Grid (S $\mu$ G) where control signals can be provided as and whenever required. The program is focused to discuss various aspects of smart micro grid. Following are the topics to be covered in this program:

- ❖ Electricity Regulatory and Policy Matters for S $\mu$ G.
- ❖ Modelling, Analysis and Optimization of S $\mu$ G.
- ❖ Communication grandness in S $\mu$ G.
- ❖ Protection challenges and Control of S $\mu$ G.
- ❖ Cyber Security issues in S $\mu$ G.
- ❖ Hands-on sessions for the Designing of Communication assisted S $\mu$ G System.
- ❖ Demand Response in S $\mu$ G

## RESOURCE PERSONS:

Subject experts from prestigious academic institutions (like IITs, NITs, etc.), R&D organizations, and industries will deliver the workshop content. The coordinators and student volunteers will mentor the hands-on sessions.

## WHO CAN ATTEND

- ❖ Only UG (Final Year), regular PG and Ph.D. students pursuing their degree from AICTE-approved institutions within India are eligible to apply.
- ❖ The applicants should produce an Application Form and a "No Objection Certificate (NOC)" from the Supervisor/Head of the Department/ Institute, allowing their student to undergo training in the workshop if selected.
- ❖ NoC format can be found in registration link

## ABOUT REGISTRATION

Maximum attendees: 25 (selection based on merit and first come, first serve basis)

Link for registration:  
<https://forms.gle/szATMCijDrcih5JG7>



- ❖ Last date of registration: 2<sup>nd</sup> March 2024
- ❖ Confirmation of participants through e-mail: 2<sup>nd</sup> March 2024
- ❖ No Registration Fee
- ❖ Only selected candidates will be informed by email/phone, therefore the candidates must provide valid email Id and contact number while doing online registration.
- ❖ The selected candidates will be informed on first come first serve basis. Candidates must acknowledge the acceptance for participation through return email, failing which the wait-listed candidates may be called for the workshop.
- ❖ Certificates will be provided to the participants after the successful completion of the workshop.
- ❖ Selected participants will be accommodated in Institute guest house/hostel rooms (if available) with catering facilities under the funds approved by SERB (as per norms).
- ❖ The participating students will be eligible for TA reimbursement for their journey to the host institute from their hometown/home institute, both ways for the train or bus's lowest fare, as per the GoI norms.

## CONTACT PERSON

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