The DC/DC converter design workshop aims to provide participants with a comprehensive understanding of the principles, methodologies, and practical aspects of designing efficient and reliable DC/DC converters. This workshop is tailored for engineers, researchers, and enthusiasts looking to deepen their knowledge of power electronics and advance their skills in converter design. This workshop focuses also on the integration of microcontrollers for advanced closed-loop control in DC/DC converters. Participants will gain hands-on experience in implementing control algorithms to optimize performance, stability, and efficiency in power electronics applications.

Highlights of the Event

- Introduction to DC/DC Converters
- Design Considerations and Component Selection
- Simulation and Verification
- Microcontroller Overview and Programming Basics
- Integration of Microcontroller in DC/DC Converter Design
- PCB Layout
- Hands-on Labs and Case Studies
- Testing and Validation
- Case Studies and Practical Examples

Workshop Outcome:

By the end of the workshop, participants will gain a solid understanding of both theoretical concepts and practical skills necessary to design, implement, and optimize DC/DC converters using microcontrollers effectively. This knowledge is crucial for engineers and professionals involved in power electronics, embedded systems, and related fields seeking to enhance their expertise in power management and control technologies.

Workshop Topics:

- ✓ **Machine learning (ML) based State of Charge Estimation for Lithium- ion Battery Pack**
- ✓ **Designing of Switching Converters for Microgrid Application**
- ✓ **Real-time implementation of intelligent control methods for grid forming inverters**
- ✓ **Demonstration on Design and Implementation of Intelligent controller for Efficient Power Management in Hybrid Microgrids**
- ✓ **Demonstration of Various Intelligent MPPT Techniques of Solar and Wind Energy System**
- ✓ **Active Power Management In A Hybrid AC/DC Microgrid Integrated With Composite Energy Storage Devices**
- ✓ **Analysis of Different Phase Shifting Techniques for DAB Converter in EV Application**
- ✓ **Advance Power Management Techniques of a DC Microgrid**
- ✓ **Interfacing of C2000 Launch pad with MATLAB and PWM Signal Generation**
- ✓ **Inverter Control of Bidirectional Converter with PV System in Islanded and Grid Connected Mode**
- ✓ **Interfacing of PV Module and Battery through SEPIC and DAB Converter**
- ✓ **Applications of Convolutional Neural networks in Electric Vehicle**
- ✓ **Forecasting of Solar Energy using ML Approaches**
- ✓ **Some Analytical Perspectives on Modeling, Small-Signal Stability Analysis and Chaos Control of Power Electronic Converters**
- ✓ **Real-Time Application of Smith Predictor for systems with dead time**

Laboratory Sessions:

- ✓ **Real-time Integration of Solar and Pico-hydro with energy storage systems for stand-alone microgrid**
- ✓ **Real-time Implementation of Intelligent and Optimized MPPT Algorithm techniques for MPP tracking of PV Module with Arduino AT Mega Board**
- ✓ **Battery Charging and Discharging with DAB Converter**
- ✓ **Fabrications of Driver Circuits and Sensors for Converter Applications**
- ✓ **PCB Layout design for DC-DC Converters, and Testing with Arduino Board interface**

NATIONAL INSTITUTE OF TECHNOLOGY ROURKELA

Five Days Virtual FDP/ Workshop/ Webinar on "AI/ML-Based Controller Design and Deployment on Real-Time Platforms" (AMCDDRP-2025)

5th November to 9th November 2025
(Online Mode)

Principal Coordinator

Dr. Arnab Ghosh

Organized By

Dept. of Electrical Engineering
National Institute of Technology
Rourkela, Odisha - 769008

Technically Co-sponsored by:

IEEE Kolkata Section IA & PE Joint Societies Chapter-Rourkela

IEEE ROURKELA SUBSECTION

IEEE Kolkata Section IA & PE Joint Societies Chapter-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/

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About the Departments:

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 programmed with the mission to develop a platform for forging students as technocrats in line with cutting-edge academic, research and modern industrial practices.

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

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International Participants	90 USD
No registration fee for students/ staff of NIT Rourkela	

Important Dates:

Registration Deadline: 3rd November 2025

Workshop Date: 5th – 9th November 2025

Contact:

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