

About the Course:

Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL), and Reinforcement Learning (RL) are transforming the analysis, control, and operation of modern engineering systems. With the increasing penetration of renewable energy resources, smart grids, and electric vehicles, power systems and power electronics are becoming more complex and data-intensive, creating a strong demand for intelligent, adaptive, and data-driven solutions.

This programme is designed to provide participants with advanced knowledge of AI/ML techniques, including optimization methods, deep learning architectures, reinforcement learning, and intelligent decision-making. Hands-on sessions in MATLAB and Python will enable participants to develop, train, and implement modern AI/ML models for real-world applications in power systems and power electronics.

The course will emphasize the application of AI/ML techniques to contemporary challenges in power systems and power electronics. Participants will learn data-driven approaches for load and renewable energy forecasting, smart grid analytics, fault detection and classification, stability assessment, energy management, intelligent converter control, predictive maintenance, and electric vehicle battery management systems. Through lectures, practical laboratory sessions, and case studies, the programme will provide participants with valuable insights into the development of intelligent solutions for next-generation power and energy systems, fostering both research innovation and industrial applications.

Course Coverage:

- **Mathematical foundations** of ML and DL
- Optimization methods for AI/ML
- Advanced ML algorithms and performance evaluation
- Deep neural networks and architectures
- Reinforcement learning and intelligent decision-making
- **AI/ML applications in Power Systems:** Load and renewable energy forecasting, smart grid analytics, fault detection and classification, stability assessment, energy management, optimal operation and control.
- **AI/ML applications in Power Electronics:** Intelligent converter control, fault diagnosis and condition monitoring, predictive maintenance, electric vehicle and battery management systems.
- **Lab Sessions:** Hands-on implementation of ML, DL, and RL algorithms in MATLAB/Python, data preprocessing, feature engineering, and visualization techniques
- End-to-end AI/ML project development and deployment for real world engineering applications

Key Speakers:

- *Prof. Premalata Jena, IIT Roorkee*
- *Prof. Sumit K. Chattopadhyaya, IIT Delhi*
- *Prof. Suman Maiti, IIT Kharagpur*
- *Dr. Rakesh Panguloori, Texas Instruments (TI), Bengaluru, India*
- *Dr. Suvajit Mukherjee, Belectriq Pvt. Ltd., Bengaluru, India*
- *Mr. Sudhir Sarawat, Horizon Fuel Cell India.*
- *Prof. Pravat Kumar Ray, NIT Rourkela*
- *Prof. Monalisa Pattnaik, NIT Rourkela*
- *Prof. Ananyo Sengupta, NIT Rourkela*
- *Mr. Manish Barwar, OPAL RT Technologies India Pvt. Ltd.*
- *Mr. S. Aloka Patro, Director, Apstronics Technologies Pvt. Ltd.*



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Foundation



ANRF-PAIR Outreach Activity

Short Term Course & Faculty Development Programme on

Advanced Machine Learning and Intelligent Applications in Power Systems and Power Electronics

(AMLIA-PSPE-2026)

25th - 29th August 2026

Coordinators

Prof. Pravat Kumar Ray

Prof. Ananyo Sengupta

Prof. Monalisa Pattnaik

Organized By

**IEEE Kolkata Section IA & PE Jt. Societies
Chapter and IES Chapter-Rourkela
in association with**

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



Introduction:

The rapid advancement of Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL), and Reinforcement Learning (RL) is transforming the analysis, control, and optimization of modern engineering systems. The increasing integration of renewable energy resources, smart grids, electric vehicles, and power electronic converters has introduced new operational challenges and generated vast amounts of data, creating a growing demand for intelligent and data-driven solutions.

This FDP focuses on advanced AI/ML techniques and their applications in power systems and power electronics. Participants will gain insights into machine learning, deep learning, reinforcement learning, optimization methods, and practical implementation using MATLAB and Python. The programme will cover applications such as forecasting, smart grid analytics, fault diagnosis, energy management, intelligent converter control, predictive maintenance, and EV battery management through a combination of theory, hands-on laboratory sessions, and real-world case studies.

About the Institute:

The course will be organized by the Dept. of Electrical Engineering at 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>

34 NIRF Overall	13 NIRF Engineering	30 NIRF Research	317 – 78 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://nitrkl.ac.in/EE/>

Contact us:

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Online Account Details:

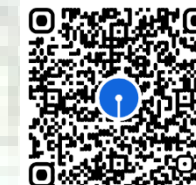
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IFSC No: SBIN0002109

Branch: State Bank of India, NIT Campus Rourkela.

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Important Dates:

Registration Deadline: 20th August 2026

Short-term Course Date: 25th-29th August 2026

Registration Details:

Category	Online Registration Fee (Including 18% GST)	Offline Registration Fee (Including 18% GST)
Research Scholars / PG / UG Students (3 rd year onwards)	₹ 944.00	₹ 1770.00
Faculty from Engineering Institutes	₹ 1770.00	₹ 2950.00
Engineers from Industry and R&D Organizations	₹ 2360.00	₹ 4720.00
Participant from Abroad	\$ 118.00	\$ 236.00

Accommodation & Food Extra for Offline Participants.
**No registration fee for students / staffs of NIT Rourkela and
need to register separately.**