



NATIONAL POWER



**POST GRADUATE DIPLOMA COURSE
IN
POWER DISTRIBUTION & EMERGING
TECHNOLOGIES**



Power Distribution & Emerging Technologies

The distribution networks have evolved significantly over the past hundred years. The users' varying demands are the primary driving force for the advancement of distribution networks. With the development of modern societies, attention to power supply reliability was raised, motivating the adoption of new topologies such as redundant backup lines and multi-segment interconnected networks for critical load areas. Distribution networks constitute an essential sector in electric power systems. A distribution network is designed to receive the power transmitted via long-distance high-voltage transmission lines, and then distribute the power to thousands of local users. Therefore, the distribution network usually has the closest connection with the end-users and exhibits the most direct impacts on users' experience. One of the most significant changes to power systems around the world has been the rapid installation of renewable energy resources. These include wind farms, photovoltaics, energy storage systems, fuel cells, electric vehicles, and controllable loads. The modern needs of users, such as high reliability and quality power supply, integration and utilization of distributed energy resources (DERs), flexible service to electric vehicles (EVs), and energy transactions among multiple stakeholders, are all accomplished by distribution networks. The distribution network has become the most fundamental, crucial, and animated section in the evolution of modern power systems. In recent years, flexible and customized power for direct current (DC) loads such as EV and IT equipment are emerging, facilitating the application of advanced power electronic devices.

The large penetration of renewable energy resources into power transmission and distribution networks causes several operational considerations and technical interconnection issues. control and operation of modern power systems have been complicated by the penetration of the various energy resources and technologies.

In modern power systems, the digitalization, decentralization, and electrification of the power systems have become challenging issues. New emerging technologies, such as advanced metering and monitoring, active network operation, digital grids, multi-energy hubs, smart grids, and micro grids, are being developed and introduced to meet these technical challenges. The various design and control schemes are applied to these emerging technologies to enhance the operational flexibility of the modern power system. The 52 Weeks PGDC in Power Distribution & Emerging Technologies will cater the changing technological needs of the sector by imparting the training to students. This course will increase the skills set of students and their employment opportunity



will increase in the Power Sector. The broad outlines of the course are as below:

Term-1: Class Room Module: 26 Weeks

- **General introduction & Basic Electrical Engineering: 1.0 week**
- **Power Generation -Thermal, Hydro, Nuclear and Gas: 1.0 week**
- **Distribution System Engineering: 2.0 weeks**
- **Distribution Substations: 1.0 week**
- **O & M of Distribution Substation: 1.0 week**
- **Transformers: 1.0 week**
- **Distribution Metering: 1.0 week**
- **Advanced Metering Infrastructure: 2.0 weeks**
- **Power Cables and Jointing Techniques: 02 Days**
- **Communication in Power Systems: 03 Days**
- **Cyber Security & Emerging Technologies: 01 Week**
- **Renewable Energy Sources: 2.0 weeks**
- **Power Transmission: 1.0 week**
- **Power System Protection: 1.0 week**
- **Power system Operation - Active Power Control, Reactive power Management, SCADA, Automatic Generation Control and Economic Despatch: 3.0 weeks**
- **Electrical Safety and Statutory Regulations: 1.0 week**
- **Contract Management: 1.0 week**
- **Soft Skills: 1.0 week**
- **LAB/ Simulator Training: 2.0 weeks**
- **Mid-term assessment (after 3 Months): 1.0 week**
- **End term assessment: 1.0 week**
- **Total Classroom Training: 26 weeks**

Term-2: Internship Training (26 Weeks)

Internship Training at BSES (Paid)	24 weeks
Mid-term assessment (after 3 Months)	1.0 week
End Term & Final term assessment	1.0 week
Total	26 weeks