

MODULE SYNOPSIS

Modules under PDC 1:

ET1655 Electricity Acts and Regulations

This module introduces the electricity market, electricity acts and regulations. An overall view of how electrical power is generated, transmitted and distributed technologies and system, components and basic workings of electric transmission and distribution network.

ET1600 Dynamics & Control

This module aims to provide a thorough understanding of the fundamentals of control engineering and applications. Topics include mathematical modelling, transient analysis, error analysis and introduction to system optimization, stability analysis, s-plane analysis, frequency response analysis and compensation techniques. Basic control actions and industrial automatic controllers as well as advanced control techniques.

Modules under PDC 2:

ET1613 High Voltage Operation

This module introduces high voltage equipment and accessories like high voltage switchgears, circuit breakers, transformers, metering and protection relays. Understanding of high voltage single line and control drawings will be emphasised so that the student can understand the control, instrumentation and protection functions of high voltage switchgears. The course will also cover different protection schemes, application of on-load tap changers, and high voltage testing, commissioning and maintenance.

ET1611 Power System Protection

This module teaches the fundamental principles of relay operation and shows how they are applied to the protection of specific system elements. Over-current, directional, differential, pilot and distance protective relays will be described. Calculation of relay settings for the different types of relays will be explained. Also included are the fundamental application principles, special requirements of the various system elements, application practices, and methods of testing and commissioning protective schemes.

Modules under PDC 3:

ET1610 Computer Methods for Power System Analysis

This module provides students to learn techniques and algorithms for the formulation of network matrices for power system analysis such as power system fault studies for symmetrical and unsymmetrical faults, load flow studies and transient stability analysis. Emphasis is on the application of computer methods for solution of these problems. Interpretation and use of results to specify circuit breaker ratings and relaying systems, methods of reinforcing and improving system security and stability will be included.

ET1522 Power Quality and Energy System

This module furnishes participants on the causes of power quality issues, voltage dips and their effects on sensitive process and facilities, harmonics distortion and its effects on power system equipment, mitigation methods and power quality monitoring. Participants will learn the principles of different energy resources, including stand-alone and grid connected system, how to implement fuel cell technology in a variety of applications. The module also covers lighting technology principles and efficient lighting practices. The working principles/configurations of DC, AC and Chopper drives and various application areas of electrical drives will be covered.

Modules under PDC 4:

ET1614 Power System Planning and Control with Security

This module introduces to the engineering and economic factors involved in planning, operating and controlling power systems. Topics include planning procedures for large utilities and industrial power systems, reliability and contingency analysis, economic studies and financial analysis and computerised Supervisory Control and Data Acquisition (SCADA) systems. Developing trends and the use of Artificial Intelligence in a computerised power system, and electricity market will also be discussed. This module will also cover security of SCADA which includes Vulnerability and Risk Assessments, Threats to SCADA and Industrial Control Systems (ICS), ICS Security Tools and ICS Security Architecture and Best Practices to enhanced ICS cyber defence.

ET1612 Power Transmission and Distribution

This module provides students with an insight into the areas of designs and roles of electricity transmission and distribution. Also enables them to understand the principles of operation of various types of busbar arrangements, network configurations and high voltage equipment including cables, reactive power and voltage compensation devices. Overvoltages and voltage transients in power systems and the concept of insulation co-ordination for high voltage equipment are introduced. The application of computer and CAD software packages to carry out electrical design and drafting will also be included. Smart metering and smart grid will also be discussed.