

MODULE SYNOPSIS

Certificate in High Voltage Operation & Protection

Module 1 - 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.

Module 2 - 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.

Certificate in Power System Planning, Security, Transmission & Distribution

Module 3 - 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.

Module 4 - 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.