

Electric Power System Modelling and Simulation Tools

COURSE OVERVIEW

This course offers a comprehensive study of the principles, challenges, and modern practices in ensuring the stability, protection, and control of power systems. Participants will explore the dynamic behavior of power systems, causes of instability, and various methods to enhance system resilience. The curriculum delves into protection strategies, control schemes, relay coordination, fault analysis, and advanced automation tools used in modern grids. Through case studies, simulations, and industry-based scenarios, participants will gain hands-on experience in diagnosing instability problems, designing robust protection systems, and implementing control strategies that ensure safe, efficient, and stable operation of electrical networks.

WHO SHOULD ATTEND?

This course is designed for electrical engineers, system analysts, power system planners, utility engineers, renewable energy specialists, researchers, and postgraduate students who are involved in design, operation, or performance assessment of power systems. It is equally valuable for consultants, project developers, and technical trainers seeking gain proficiency in simulation-based decision-making and advanced grid analysis.

COURSE OUTCOMES

Delegates will gain the skills and knowledge to:

- Develop mathematical models for generators, transformers, and transmission systems.
- Perform steady-state and dynamic simulations using industry-standard tools.
- Evaluate system stability under different operating and contingency scenarios.
- Simulate control schemes for voltage and frequency regulation.
- Model renewable energy sources and their interaction with the conventional grid.
- Validate system models against actual performance data.

KEY COURSE HIGHLIGHTS

At the end of the course, you will understand;

- The structure and architecture of modern electric power systems and their modelling requirements.
- The process of performing load flow and contingency analyses for system planning.
- How to simulate transient, voltage, and frequency stability using time-domain approaches.
- Integration and simulation of distributed generation and renewable systems.
- The use of control models for grid automation and system reliability enhancement.
- Comparative analysis of various power system simulation tools and their applications.
- The importance of data validation, parameter tuning, and model accuracy in power system studies.

All our courses are dual-certificate courses. At the end of the training, the delegates will receive two certificates.

1. A GTC end-of-course certificate.
2. Continuing Professional Development (CPD) Certificate of completion with earned credits awarded.