



London TDM

# Mechanical and Electrical Engineering Training Courses

**Course Venue:** United Arab Emirates - Dubai

**Course Date:** From 30 November 2025 To 04 December 2025

**Course Place:** Downtown Dubai

**Course Fees:** 5,000 USD

## Introduction

The "Smart Electrical Grids and Modern Substations" course is designed to provide professionals with a comprehensive understanding of the evolving landscape of electrical power systems. Participants will explore the integration of smart technologies into traditional grids, the transformation of substations, and the role of these innovations in enhancing grid reliability, efficiency, and sustainability.

### Objectives

- Understand the fundamentals of smart grid technology and its components.
- Learn the latest advancements in substation automation and digitalization.
- Analyze the impact of smart grids on energy distribution and management.
- Explore the role of renewable energy sources within smart grids.
- Evaluate the security, policy, and regulatory challenges of implementing smart grids.

## Course Outlines

### Day 1: Introduction to Smart Grids

- Overview of traditional vs. smart grids
- Major components of smart grid technology
- Benefits and challenges of smart grid implementation
- Case studies of successful smart grid projects
- Introduction to smart meters and intelligent devices

### Day 2: Substation Automation and Modernization

- Role and functions of modern substations in smart grids
- Technologies driving substation automation
- Integration of digital and analog systems
- Standards and protocols in substation automation
- Case studies of modern substations

### Day 3: Advanced Metering Infrastructure (AMI)

- Components and architecture of AMI
- Data management and analytics in AMI
- Communication technologies in AMI systems
- Benefits of AMI for utilities and consumers
- Challenges and solutions in AMI deployment

### Day 4: Renewable Energy Integration

- Role of renewable energy in smart grids
- Technologies for integrating solar and wind power
- Energy storage and management solutions
- Grid-tied versus off-grid systems
- Impact of renewable integration on grid stability

### Day 5: Smart Grid Security and Regulations

- Cybersecurity challenges in smart grids
- Regulatory frameworks and compliance requirements
- Privacy concerns and data protection strategies
- International standards and best practices
- Future trends in smart grid policies and regulations