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MAINTENANCE AND ENGINEERING | ME-007

Future-Ready Electrical Distribution

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Course content

Why Attend

Electrical distribution systems are evolving rapidly with the adoption of smart grids, renewable energy integration, automation, and digital technologies. This course equips participants with the knowledge and practical skills required to plan, design, automate, and modernize electrical distribution networks while improving system reliability, resilience, operational efficiency, and cybersecurity. Participants will also explore emerging technologies that are shaping the future of power distribution.

Course Methodology

The course combines instructor-led presentations, engineering workshops, case studies, software demonstrations, group discussions, practical exercises, and real-world examples to provide participants with both technical knowledge and practical implementation strategies.

Course Objectives

By the end of this course, participants will be able to:

- Understand modern electrical distribution system principles and architectures
- Plan and design reliable and efficient distribution networks
- Apply automation technologies to improve distribution system performance
- Integrate renewable energy and distributed energy resources into distribution networks
- Evaluate digital technologies, cybersecurity, and smart grid applications
- Develop long-term strategies for resilient and future-ready electrical distribution systems
- Apply best practices for sustainable and intelligent power distribution

Target Audience

- Electrical engineers
- Power system engineers

Course content

Target Audience

- Distribution system planners
- Utility engineers and supervisors
- Maintenance engineers
- Operations engineers
- Asset management professionals
- Professionals involved in electrical infrastructure development

Target Competencies

- Electrical distribution systems
- Distribution planning
- Smart grid technologies
- Distribution automation
- Renewable energy integration
- Cybersecurity awareness
- Power system reliability
- Strategic infrastructure planning

Course outline

Day 1: Fundamentals of Modern Electrical Distribution Systems

- Understanding the structure and operation of electrical distribution systems
- Reviewing major components of modern distribution networks
- Comparing radial, loop, and network distribution configurations
- Identifying current industry trends, technological advancements, and operational challenges

Course content

Course outline

• Understanding regulatory frameworks, technical standards, and compliance requirements

• Applying safety principles within electrical distribution environments

• Evaluating future opportunities for modernizing distribution infrastructure

Day 2: Distribution System Planning and Network Design

• Applying principles of electrical distribution planning and system development

• Forecasting electrical demand and evaluating future load growth

• Designing reliable and resilient distribution network configurations

• Selecting appropriate equipment, materials, and system components

• Utilizing engineering software tools to support planning and design activities

• Performing economic evaluations using life-cycle costing and cost-benefit analysis

• Practical workshop: Developing an optimized distribution network design

Day 3: Distribution Automation and Smart Grid Technologies

• Understanding the principles and benefits of distribution automation

• Exploring intelligent electronic devices, communication networks, and automation architectures

• Implementing smart grid technologies to enhance operational efficiency

• Utilizing SCADA systems for monitoring, control, and real-time decision-making

• Improving fault detection, isolation, and service restoration through automation

• Reviewing successful automation projects and implementation best practices

Day 4: Advanced Distribution Technologies and Digital Integration

• Integrating renewable energy resources into electrical distribution systems

• Managing the operational impacts of distributed generation and renewable technologies

• Understanding microgrid design, operation, and control strategies

Course content

Course outline

- Evaluating distributed energy resources and energy storage applications
- Applying cybersecurity principles to protect digital distribution infrastructure
- Developing resilient distribution systems capable of supporting future energy demands

Day 5: Future Distribution Networks and Strategic Development

- Exploring emerging technologies transforming electrical distribution systems
- Understanding digital transformation, artificial intelligence, and predictive analytics in power distribution
- Developing long-term investment and infrastructure modernization strategies
- Improving system resilience, sustainability, and operational flexibility
- Practical workshop: Developing a future-ready electrical distribution roadmap
- Course review, implementation planning, lessons learned, and final Q&A

Seminar dates

Available seminar dates

Live dates and pricing for Future-Ready Electrical Distribution generated from the course details page.

Date	Location	Format	Fee
Dates on request	Venue on request	Classroom	**Contact us**

Live online option	Online delivery is available at €1,850.-.