AMERICAN GLOBAL INSTITUTE
FOR PRIVATE TRAINING

External Training Course

Next-Gen Electrical Power Distribution: Smart Grids & Energy Flow

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From 23 Mar. 2026 To 27 Mar. 2026
From 27 Apr. 2026 To 01 May 2026
From 25 May 2026 To 29 May 2026

Radisson Blu Hotel Madrid Prado
Madrid, Spain

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External Training Course:

Next-Gen Electrical Power Distribution: Smart Grids & Energy Flow

From 23 Mar. 2026 To 27 Mar. 2026 **Fees: 1950 KD**
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Course Overview

The Next-Gen Electrical Power Distribution: Smart Grids & Energy Flow course is a comprehensive 5-day program designed for electrical engineers, energy professionals, and technical leaders who want to excel in modern power distribution systems. This course focuses on the principles, technologies, and strategies that underpin efficient, reliable, and sustainable electrical networks.

Participants will gain a deep understanding of power distribution architecture, smart grid integration, energy flow optimization, and system monitoring. Through a combination of theoretical lessons, real-world case studies, and practical exercises, attendees will develop the skills necessary to design, operate, and troubleshoot advanced electrical distribution systems.

By the end of this course, participants will be equipped with the knowledge and tools to:

- Enhance the reliability and efficiency of electrical distribution networks.
- Implement smart grid technologies and automation solutions.
- Optimize energy flow for cost-effectiveness and sustainability.
- Analyze system performance and apply corrective strategies.
- Understand regulatory standards and best practices in modern power distribution.

This course blends hands-on practical experience with strategic insights, enabling participants to immediately apply what they learn in professional environments, ensuring both technical proficiency and operational excellence.

Course Objectives

By the end of this 5-day course, participants will be able to:

- Fundamentals of Electrical Power Distribution.
- Smart Grid Insights.
- Energy Flow Optimization.
- System Troubleshooting & Problem-Solving.
- Reliability & Safety Enhancement.
- Integration of Renewable Energy.
- Compliance with Industry Standards.
- Application Across Job Levels.

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Training Methodology

Interactive Lectures.
Case Studies.
Hands-On Exercises.
Group Discussions.
Quizzes & Assessments.
Visual Aids & Demonstrations.
Practical Simulations.
Collaborative Problem-Solving

Organizational Impact

Enhanced Operational Efficiency.
Increased System Reliability.
Better Decision-Making.
Sustainable Energy Integration.
Compliance & Safety.
Team Collaboration.
Reduced Downtime & Losses.
Improved Workforce Capability.

Personal Impact

Improved Technical Knowledge.
Enhanced Problem-Solving Skills.
Better Understanding of Smart Grids.
Increased Efficiency in Daily Tasks.
Stronger Decision-Making Abilities.
Practical Application of Energy Optimization.
Confidence in Handling Electrical Systems.
Career Growth & Professional Development.

Course Content & Outline

Day 1 – Fundamentals of Electrical Power Distribution

- Introduction to Electrical Power Systems.
- Power Flow Principles.
- Voltage Levels and Regulation.
- Distribution Transformers.
- Basic Power Quality Concepts.
- Components of Distribution Networks.
- Load Types and Characteristics.
- Protective Devices & Circuit Breakers.
- Substation Overview.
- Safety Practices in Distribution.

Day 2 – Smart Grid Technologies

- Introduction to Smart Grids.
- Communication Networks in Distribution.
- SCADA Systems Overview.
- Grid Monitoring Tools.
- Energy Storage Integration.
- Advanced Metering Infrastructure (AMI).
- Automation & Control Systems.
- Intelligent Electronic Devices (IEDs).
- Demand Response Techniques.
- Cybersecurity in Power Distribution.

Day 3 – Energy Flow & Optimization

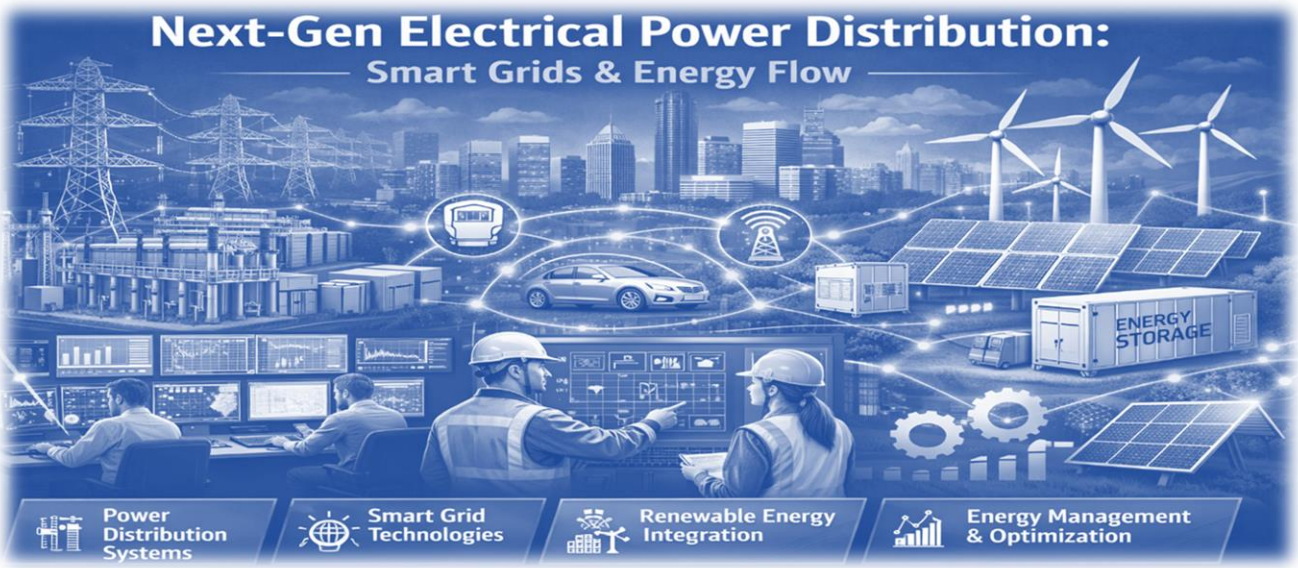
- Load Flow Analysis.
- Voltage and Reactive Power Control.
- Power Factor Improvement.
- Renewable Energy Impact on Distribution.
- Energy Efficiency Measures.
- Energy Loss Reduction Techniques.
- Network Reconfiguration Strategies.
- Distributed Generation Integration.
- Peak Load Management.
- Cost-Effective Energy Management.

Day 4 – System Reliability & Troubleshooting

- Reliability Concepts & Indicators.
- Protection Coordination.
- Maintenance Planning.
- Risk Assessment & Mitigation.
- Case Studies of Real Failures.
- Fault Analysis Techniques.
- Outage Management.
- Troubleshooting Common Issues.
- Performance Monitoring.
- Root Cause Analysis.

Day 5 – Application, Compliance & Professional Development

- Industry Standards & Regulations.
- Strategic Decision-Making.
- Project Planning & Implementation.
- Emerging Technologies in Distribution.
- Operational Excellence Strategies.
- Safety Compliance & Best Practices.
- Team Collaboration & Communication.
- Smart Grid Case Studies.
- Career Skills in Power Engineering.
- Course Review & Action Planning.



Course Agenda:

(1st Day) Agenda

9.00	11.30	Discuss Course Major Points • Fundamentals of Electrical Power Distribution • Smart Grid Technologies • Energy Flow & Optimization • System Reliability & Troubleshooting • Application, Compliance & Professional Development
11.30	12.00	Coffee Break
12.00	14.00	Fundamentals of Electrical Power Distribution • Introduction to Electrical Power Systems. • Components of Distribution Networks. • Power Flow Principles. • Load Types and Characteristics. • Voltage Levels and Regulation. • Protective Devices & Circuit Breakers. • Distribution Transformers. • Substation Overview. • Basic Power Quality Concepts. • Safety Practices in Distribution.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(2nd Day) Agenda

9.00	11.30	Smart Grid Technologies • Introduction to Smart Grids. • Advanced Metering Infrastructure (AMI). • Communication Networks in Distribution. • Automation & Control Systems. • SCADA Systems Overview.
11.30	12.00	Coffee Break
12.00	14.00	Smart Grid Technologies • Intelligent Electronic Devices (IEDs). • Grid Monitoring Tools. • Demand Response Techniques. • Energy Storage Integration. • Cybersecurity in Power Distribution.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(3rd Day) Agenda

9.00	11.30	Energy Flow & Optimization • Load Flow Analysis. • Energy Loss Reduction Techniques. • Voltage and Reactive Power Control. • Network Reconfiguration Strategies. • Power Factor Improvement.
11.30	12.00	Coffee Break
12.00	14.00	Energy Flow & Optimization • Distributed Generation Integration. • Renewable Energy Impact on Distribution. • Peak Load Management. • Energy Efficiency Measures. • Cost-Effective Energy Management.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(4th Day) Agenda

9.00	11.30	System Reliability & Troubleshooting • Reliability Concepts & Indicators. • Fault Analysis Techniques. • Protection Coordination. • Outage Management. • Maintenance Planning.
11.30	12.00	Coffee Break
12.00	14.00	System Reliability & Troubleshooting • Troubleshooting Common Issues. • Risk Assessment & Mitigation. • Performance Monitoring. • Case Studies of Real Failures. • Root Cause Analysis.
14.00	14.30	Questions and Discussion
14.30		Buffet Lunch

(5th Day) Agenda

9.00	11.30	Application, Compliance & Professional Development • Industry Standards & Regulations. • Safety Compliance & Best Practices. • Strategic Decision-Making. • Team Collaboration & Communication. • Project Planning & Implementation.
11.30	12.00	Coffee Break
12.00	14.00	Application, Compliance & Professional Development • Smart Grid Case Studies. • Emerging Technologies in Distribution. • Career Skills in Power Engineering. • Operational Excellence Strategies. • Course Review & Action Planning.
14.00	14.30	Questions, Discussion & Conclusion Training Course.
14.30		Buffet Lunch