



Consulting and Training | Reach New Heights

Course Name

Electrical Utility Communications, Applications & Smart Grid Technologies

Sector Name

Electrical Engineering

Document Type

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Electrical Utility Communications, Applications & Smart Grid Technologies

Course Introduction

The modernization of the Electric Power Grid, often called "Smart Grid" by its proponents, is an important goal. Efforts such as the Advanced Metering Infrastructure (AMI), Automated Meter Reading (AMR), and other phases of intelligent grid management are all part of the smart grid. Having better control of the power grid will improve its Reliability and Efficiency, and, as applications are developed for end users, point-of-use monitoring and control of power usage will benefit utilities by reducing peak loads and benefit consumers.

In grid-automation applications, the control system forms the core of the design, with the communications media being a secondary consideration that can be implemented in a number of ways. Each Technology has advantages and disadvantages, and each is "best" for some circumstances. Because of the complex layout of the Power Grid and the various equipment connected to it.

Many of the Techniques used to send information to and from the Power Grid have been shown to avoid widespread Interference Problems. If an Electric Utility is implementing Grid Automation, this does not necessarily mean that there will be interference. If a utility uses a technology that does not cause interference, or if operating a

BPL system runs it at the correct power levels with notching in the Amateur bands, grid automation hardware can operate without widespread interference problems. BPL can and does play a role in grid automation, especially for the in-premise part of these systems. Other media will also be used.

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Target Audience

- ✓ Electrical Design Engineer
- ✓ Electrical Engineer
- ✓ Electrical Project Engineer

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Learning Objectives

- ✓ Understanding of the emerging Smart Grid “Intelligent Power System”.
- ✓ Also, it will review all aspects of the Smart Grid, including definition, major components, important features, and practical examples of this new technology.
- ✓ Instructor of the course led demonstrations will be performed by the Instructor following Selected Sections (where applicable).

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Course Outline

✓ DAY 01

Module (01) Introduction

- ✓ Defining a Smart Grid
- ✓ Characteristics of a Smart Grid
- ✓ Value of a Smart Grid
- ✓ The Economic Case
- ✓ The Environmental Case
- ✓ Benefits to Utilities
- ✓ Benefits to Consumers

Module (02) The “SMART” Power Grid

- ✓ Power System Overview
- ✓ Power System Components
- ✓ Key Infrastructure Issues
- ✓ Power System Protection – Traditional vs ‘Smart’
- ✓ Network Blackout – An example

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Course Outline

✓ Day 02

Module (03) Consideration of Smart Grid

- ✓ Challenges and Opportunities
- ✓ Regulatory Challenges
- ✓ Utility Business Model
- ✓ Consumer Impacts
- ✓ Cost of a Smart Grid
- ✓ Government Smart Grid Stimulus

Module (04) Power Generation

- ✓ Generation Fundamentals
- ✓ Traditional Generation
- ✓ Distributed Generation
- ✓ Micro-Grid Generation
- ✓ Generator Protection

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Course Outline

✓ Day 03

Module (05) Power Grid Interconnection

- ✓ Transmission Lines
- ✓ Grid Interconnection – Systems
- ✓ Grid Interconnection – DGT
- ✓ Transmission Line Protection
- ✓ Wide Area Protection
- ✓ Communication Networks
- ✓ Line Current Differential Protection
- ✓ Instructor-led Lab Exercises

Module (06) Smart Power Consumers

- ✓ Saving Power/Saving Money
- ✓ Smart Meters
- ✓ Off-Peak Demand
- ✓ Load Shedding
- ✓ Alternate/Green Energy Systems



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Course Outline

✓ Day 04

Module (07) Power Distribution System

- ✓ Distribution Systems
- ✓ Smart Substation
- ✓ Feeders
- ✓ Transformers
- ✓ Micro-Grids
- ✓ Smart Grid Key Points
- ✓ Commercial / Residential

Module (08) Communication Key to Smart Grid

- ✓ Wide Area Networks
- ✓ Information to/from Substations
- ✓ Wireless Networks
- ✓ Distribution Automation
- ✓ AMI Networks

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Course Outline

✓ Day 05

Module (09) Network Security

- ✓ Potential Threats
- ✓ Government Regulations
- ✓ Network Protection
- ✓ IEC 61850 Considerations

Module (10) Smart Grid Monitoring & Control

- ✓ Utility Monitoring & Control
- ✓ Inter-System Coordination
- ✓ Industrial Systems
- ✓ Consumer/Residential
- ✓ Bringing it All Together
- ✓ Working with The Government

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
July 5, 2027	July 9, 2027	5 days	4250.00 \$	UAE , Abu Dhabi
Sept. 7, 2026	Sept. 11, 2026	5 days	4250.00 \$	UAE , Abu Dhabi
Sept. 13, 2026	Sept. 17, 2026	5 days	4250.00 \$	Oman , Muscat
Dec. 28, 2026	Jan. 1, 2027	5 days	4250.00 \$	UAE , Dubai
Jan. 24, 2027	Jan. 28, 2027	5 days	4250.00 \$	KSA , Riyadh

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