

Course No. 1267

AI in Energy & Utilities Training Course

AI FOR INDUSTRY
ARTIFICIAL INTELLIGENCE & APPLICATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The AI in Energy & Utilities Training Course is an advanced professional program designed to equip executives, managers, engineers, technical specialists, and decision-makers with the knowledge and practical capabilities required to apply Artificial Intelligence (AI) across the energy and utilities sector. As energy organizations face increasing demands for operational efficiency, asset reliability, predictive maintenance, resource optimization, grid modernization, and sustainability, AI has become an important enabler for improving how energy systems are planned, operated, monitored, and maintained. This course provides a structured framework for understanding and applying AI technologies to real-world energy and utility challenges.

The program explores the application of Artificial Intelligence, Machine Learning, Predictive Analytics, Generative AI, Computer Vision, Natural Language Processing, Internet of Things (IoT), and intelligent automation across electricity generation, transmission, distribution, renewable energy, water utilities, gas networks, and other critical infrastructure environments. Participants will examine how AI can support demand forecasting, asset performance management, predictive maintenance, energy optimization, anomaly detection, grid management, outage prediction, operational planning, and customer service.

The course also addresses the strategic, technical, and governance considerations required for responsible AI adoption in critical energy and utility environments. Topics include data management, data quality, AI governance, cybersecurity, privacy, operational technology security, model risk, regulatory considerations, human oversight, and responsible AI. These areas are essential for organizations where technology decisions can directly influence reliability, safety, service continuity, and infrastructure resilience.

Combining strategic concepts with practical applications, the AI in Energy & Utilities Training Course enables participants to identify high-value AI use cases, assess organizational readiness, develop AI implementation strategies, and establish measurable performance frameworks. Through practical workshops, sector-based case studies, analytical exercises, and implementation planning, participants will develop the capability to use AI to improve operational performance, optimize resources, strengthen asset management, support renewable energy integration, enhance service delivery, and accelerate digital transformation across energy and utility organizations.

Objectives

- Analyze energy and utility operations to identify high-value opportunities for Artificial Intelligence implementation.
- Develop a comprehensive understanding of AI technologies and their applications across energy generation, transmission, distribution, and utility services.
- Evaluate operational, asset, customer, and environmental data for AI-powered analytics and decision support.
- Apply Machine Learning and Predictive Analytics to forecasting, asset management, maintenance, and operational planning.
- Design AI-enabled solutions for energy optimization, demand forecasting, anomaly detection, and infrastructure monitoring.
- Improve asset reliability and maintenance planning through predictive and condition-based analytics.
- Strengthen the use of AI and IoT technologies for real-time monitoring and operational decision-making.
- Implement best practices in AI governance, data governance, cybersecurity, privacy, operational technology security, and responsible AI.
- Assess organizational and technological readiness for implementing AI initiatives across energy and utility environments.
- Align AI initiatives with operational excellence, digital transformation, sustainability, reliability, resilience, and long-term energy sector objectives.

Who Should Attend

The AI in Energy & Utilities Training Course is designed for executives, energy and utility managers, operations managers, asset managers, maintenance managers, engineering managers, digital transformation leaders, IT managers, OT professionals, data analysts, data engineers, AI specialists, reliability engineers, electrical engineers, mechanical engineers, control and instrumentation professionals, energy analysts, and decision-makers responsible for technology adoption and operational performance.

The course is particularly relevant for professionals working in electricity generation, transmission and distribution, renewable energy, water and wastewater utilities, gas networks, energy management, power systems, industrial utilities, infrastructure organizations, and government

energy authorities. It is also suitable for professionals involved in smart grids, energy efficiency, asset management, predictive maintenance, operational technology, and digital transformation programs.

The program is valuable for senior specialists and technical professionals who need to understand how AI can be integrated with existing operational systems, enterprise data platforms, IoT environments, and industrial technologies while maintaining appropriate standards for cybersecurity, reliability, governance, and operational continuity.

Learning Outcomes

- By the end of the AI in Energy & Utilities Training Course, participants will be able to:
- Explain the strategic role of Artificial Intelligence in modern energy and utility operations.
- Identify and prioritize AI use cases across generation, transmission, distribution, utilities, and energy management.
- Analyze energy and utility data to identify patterns, anomalies, risks, and operational opportunities.
- Apply Predictive Analytics and Machine Learning concepts to demand forecasting, asset performance, and maintenance planning.
- Design AI-enabled approaches for predictive maintenance and asset reliability improvement.
- Evaluate the use of IoT, real-time analytics, and AI for monitoring critical infrastructure.
- Develop AI-supported approaches for energy optimization, resource management, and operational planning.
- Apply data governance, AI governance, cybersecurity, operational technology security, and responsible AI principles.
- Develop KPIs and performance frameworks for measuring AI-enabled energy and utility initiatives.
- Prepare an implementation roadmap for AI adoption that aligns technology investments with operational, sustainability, reliability, and business objectives.

Course Outline

DAY 01

Foundations of AI in Energy and Utilities

- Introduction to Artificial Intelligence in the energy and utilities sector
- AI, Machine Learning, Predictive Analytics, and Generative AI fundamentals
- Energy and utility data ecosystems
- Digital transformation and intelligent infrastructure

PRACTICAL WORKSHOP

Assessing AI opportunities across energy and utility operations

DAY 02

AI for Asset Management and Predictive Maintenance

- Asset performance management and AI applications
- Predictive maintenance and condition-based monitoring
- Failure prediction and anomaly detection
- IoT-enabled asset monitoring and intelligent diagnostics

PRACTICAL WORKSHOP

Developing an AI use case for predictive maintenance and asset reliability

DAY 03

AI for Energy Optimization and Operational Performance

- Energy demand forecasting and load prediction
- AI applications for generation and operational planning
- Renewable energy forecasting and integration
- Energy efficiency, resource optimization, and intelligent control

DAY 03 — CONTINUED

PRACTICAL WORKSHOP

Developing an AI-supported energy forecasting and optimization model

DAY 04**AI Governance, Cybersecurity, and Risk Management**

- Data governance and data quality in energy and utility environments
- AI governance, model risk, and responsible AI
- Cybersecurity and Operational Technology security considerations
- Privacy, regulatory compliance, resilience, and human oversight

PRACTICAL WORKSHOP

Designing an AI governance and risk framework for a critical energy or utility application

DAY 05**AI Strategy and Implementation for Energy & Utilities**

- Developing an enterprise AI strategy for energy and utility organizations
- Prioritizing AI use cases based on business value, feasibility, risk, and operational impact
- Measuring AI value through KPIs, operational metrics, reliability indicators, and efficiency measures
- Future trends in AI, smart grids, renewable energy, digital utilities, and intelligent infrastructure

FINAL WORKSHOP

Developing a comprehensive AI in Energy & Utilities implementation roadmap, including AI use-case prioritization, data strategy, governance framework, cybersecurity requirements, technology architecture considerations, KPI framework, implementation phases, stakeholder engagement strategy, risk management approach, and organizational action plan to improve operational efficiency, asset reliability, energy optimization, service continuity, sustainability, and digital transformation.



Register or Request More Information

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