Cloud Computing in Energy Systems Training Course

Professional Development Training Course Outline

Category	Renewable Energy	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Cloud Computing in Energy Systems Training Course provides a practical and future-focused understanding of how cloud computing, artificial intelligence (AI), Internet of Things (IoT), big data analytics, edge computing, digital twins, smart grids, and advanced energy management are transforming the global energy sector. The course explores how cloud platforms can support renewable energy integration, energy forecasting, grid optimization, asset performance management, predictive maintenance, demand response, energy trading, distributed energy resources (DERs), and real-time monitoring. Participants will learn how cloud-based infrastructure enables energy organizations to securely collect, process, visualize, and analyze massive volumes of operational data while improving scalability, agility, resilience, and cost efficiency.

Designed for the rapidly evolving Energy 4.0 and digital energy ecosystem, this course connects cloud technologies with practical energy-system applications across power generation, transmission, distribution, utilities, oil and gas, renewable energy, battery storage, electric vehicles, microgrids, and smart buildings. Through practical exercises and industry case studies, participants will examine cloud architecture, cybersecurity, data governance, machine learning, API integration, cloud-native applications, digital transformation, and sustainability analytics. The program equips professionals with the knowledge to develop and evaluate cloud-enabled energy solutions that enhance operational efficiency, grid reliability, decarbonization, energy resilience, and data-driven decision-making.

Programme Curriculum

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5 days

Course Objectives

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

1. Explain cloud computing architectures and cloud-native technologies for modern energy systems.
2. Evaluate IaaS, PaaS, SaaS, hybrid cloud, multi-cloud, and edge-cloud solutions for energy applications.
3. Design cloud-enabled architectures for smart grids and digital energy platforms.
4. Apply IoT and real-time data analytics to energy monitoring and asset management.
5. Use AI and machine learning concepts for energy forecasting and optimization.
6. Develop strategies for predictive maintenance and intelligent asset performance management.
7. Analyze cloud applications for renewable energy integration and distributed energy resources.
8. Explore digital twins and advanced analytics for energy infrastructure optimization.
9. Implement concepts of cloud cybersecurity, zero-trust security, identity management, and data protection.
10. Assess cloud solutions for battery energy storage systems and electric vehicle infrastructure.
11. Apply cloud technologies to demand response, energy management, and smart-meter analytics.
12. Evaluate cloud migration, scalability, interoperability, cost optimization, and sustainability strategies.
13. Develop a roadmap for digital transformation and Energy 4.0 adoption using cloud technologies.

Target Audience

1. Energy and utility executives and managers
2. Power generation and transmission professionals
3. Renewable energy and clean-energy specialists
4. Smart-grid and energy-management professionals
5. IT, cloud, and digital-transformation teams
6. Data scientists, AI/ML and IoT professionals
7. Electrical, control, automation, and systems engineers
8. Energy consultants, project managers, researchers, and policymakers

Training Modules

Module 1: Cloud Computing Foundations for Energy Systems

- Cloud computing concepts, architectures, and **cloud service models**
- IaaS, PaaS, SaaS and **hybrid/multi-cloud strategies**
- Cloud-native technologies and scalable energy applications
- Energy-sector **digital transformation and Energy 4.0**
- Business value, scalability, agility, and operational efficiency
- **Case Study:** Migration of a traditional utility data platform to a scalable cloud environment.

Module 2: Cloud Architecture for Smart Grids

- Cloud architectures for **smart-grid operations**
- IoT-enabled substations and intelligent grid infrastructure
- Real-time monitoring and distributed data processing
- **Edge computing and cloud-edge integration**
- Grid reliability, resilience, and operational optimization
- **Case Study:** Cloud-enabled monitoring and analytics for a smart distribution network.

Module 3: IoT, Big Data and Energy Analytics

- **Industrial IoT (IIoT)** and connected energy assets
- Smart meters, sensors, SCADA and operational data
- Big-data ingestion, storage, processing, and visualization
- Real-time energy dashboards and performance analytics
- Data-driven decision-making for utilities and energy companies
- **Case Study:** Smart-meter analytics platform for identifying consumption patterns and operational anomalies.

Module 4: AI, Machine Learning and Cloud-Based Energy Forecasting

- Cloud-based **AI and machine learning** architectures
- Load forecasting and renewable-energy forecasting
- Predictive analytics for energy demand and generation
- Anomaly detection and intelligent decision support
- Automated optimization using data-driven models
- **Case Study:** Cloud-based solar and wind forecasting system for improving renewable-energy scheduling.

Module 5: Renewable Energy, Storage and Distributed Energy Resources

- Cloud management of **solar, wind, and hybrid renewable systems**
- Distributed energy resources and virtual power plants
- Battery Energy Storage System (BESS) analytics
- Electric vehicle charging and **vehicle-to-grid (V2G)**
- Renewable integration, flexibility, and grid balancing
- **Case Study:** Cloud platform coordinating solar PV, battery storage, and EV charging within a microgrid.

Module 6: Digital Twins and Predictive Asset Management

- **Digital twin technology** for energy infrastructure
- Predictive maintenance using cloud analytics
- Equipment health monitoring and failure prediction

- Asset performance management and lifecycle optimization
- Combining IoT, AI, simulation, and cloud platforms
- **Case Study:** Digital twin application for predictive maintenance of critical power-generation equipment.

Module 7: Cloud Cybersecurity, Governance and Risk Management

- **Cloud cybersecurity** for critical energy infrastructure
- Zero-trust architecture and identity/access management
- Data privacy, encryption, and secure APIs
- Cyber-risk management and incident response
- Energy-sector data governance, compliance, and resilience
- **Case Study:** Cybersecurity framework for protecting a cloud-connected smart-grid environment.

Module 8: Cloud Strategy, Sustainability and Future Energy Systems

- Cloud migration strategies and **digital transformation roadmaps**
- Cloud cost optimization and FinOps principles
- **Green cloud computing and sustainable IT**
- Interoperability, APIs, automation, and cloud-native platforms
- Future trends: AI, edge computing, digital twins, autonomous grids, and Energy 5.0
- **Case Study:** Developing a cloud transformation roadmap for a utility pursuing net-zero and digital-grid objectives.

Training Methodology

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
21 Sep 2026	25 Sep 2026	Online	$1,000
21 Sep 2026	25 Sep 2026	Physical	$1,500
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0
21 Sep 2026	25 Sep 2026	Physical	$0

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