AI for Battery Health Monitoring 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

The rapid evolution of Artificial Intelligence (AI), Machine Learning (ML), and Predictive Analytics is transforming the energy sector, particularly in Battery Health Monitoring (BHM). With the global surge in Electric Vehicles (EVs), Renewable Energy Storage Systems, and Smart Grids, ensuring battery reliability, safety, and longevity has become mission-critical. AI-driven battery analytics enables real-time diagnostics, predictive maintenance, anomaly detection, and lifecycle optimization, significantly reducing operational risks and costs while improving performance efficiency.

AI for Battery Health Monitoring Training Course provides a comprehensive, industry-focused approach to leveraging Deep Learning, IoT-enabled sensors, Digital Twins, and Data-Driven Modeling for advanced battery health monitoring. Participants will gain hands-on expertise in state-of-charge (SOC) estimation, state-of-health (SOH) prediction, fault detection, and predictive failure modeling, equipping them with cutting-edge skills aligned with Industry 4.0, Smart Energy Systems, and Sustainable Technology Innovations.

Programme Curriculum

AI for Battery Health Monitoring Training Course

Introduction

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Course Duration

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Course Objectives

1. Understand AI-driven battery diagnostics and predictive analytics
2. Apply machine learning algorithms for battery degradation prediction
3. Develop real-time battery monitoring systems using IoT and edge AI
4. Master state-of-charge (SOC) and state-of-health (SOH) estimation techniques
5. Implement deep learning models for anomaly detection in batteries
6. Analyze big data from battery management systems (BMS)
7. Design predictive maintenance strategies for energy storage systems
8. Utilize digital twin technology for battery lifecycle simulation
9. Explore cloud-based AI platforms for scalable battery monitoring
10. Integrate AI with electric vehicle (EV) battery systems
11. Enhance battery safety using intelligent fault detection models
12. Optimize battery performance using data-driven insights
13. Understand future trends in AI-powered energy storage solutions

Target Audience

1. Data Scientists and AI Engineers
2. Electrical and Electronics Engineers
3. Energy Storage Professionals
4. EV Industry Specialists
5. IoT and Embedded Systems Developers
6. Researchers and Academics in Energy Systems
7. Battery Management System (BMS) Engineers
8. Sustainability and Renewable Energy Professionals

Course Modules

Module 1: Fundamentals of Battery Technology

- Types of batteries
- Battery chemistry and working principles
- Charging/discharging cycles
- Degradation mechanisms
- **Case Study:** Lithium-ion battery lifecycle in EVs

Module 2: Introduction to AI in Energy Systems

- AI applications in energy
- Machine learning basics
- Data-driven modeling

- AI tools and frameworks
- **Case Study:** AI adoption in smart grids

Module 3: Battery Data Acquisition & IoT Integration

- Sensor technologies
- IoT architecture for BHM
- Data logging techniques
- Edge computing basics
- **Case Study:** IoT-enabled battery monitoring system

Module 4: Data Preprocessing & Feature Engineering

- Data cleaning techniques
- Feature extraction
- Time-series data handling
- Normalization methods
- **Case Study:** Preparing EV battery datasets

Module 5: State of Charge (SOC) Estimation

- SOC fundamentals
- AI-based estimation models
- Kalman filters vs ML models
- Accuracy improvement techniques
- **Case Study:** SOC prediction using neural networks

Module 6: State of Health (SOH) Prediction

- SOH indicators
- Degradation modeling
- ML regression models
- Performance evaluation
- **Case Study:** Predicting battery aging patterns

Module 7: Predictive Maintenance with AI

- Maintenance strategies
- Failure prediction models
- Risk assessment
- Cost optimization
- **Case Study:** AI-based predictive maintenance in EV fleets

Module 8: Deep Learning for Battery Analytics

- Neural networks overview
- CNN & RNN applications
- Time-series forecasting
- Model training and tuning
- **Case Study:** Deep learning for battery fault detection

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
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com