Battery Performance Testing and Diagnostics 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

In today’s rapidly evolving energy landscape, battery performance testing, energy storage optimization, and advanced diagnostics have become mission-critical for industries ranging from electric vehicles (EVs) to renewable energy systems. Battery Performance Testing and Diagnostics Training Course is designed to equip professionals with cutting-edge knowledge in battery health analysis, state-of-charge (SOC) estimation, and predictive maintenance techniques. With the global shift toward sustainable energy solutions, mastering battery diagnostics is essential for ensuring safety, efficiency, and long-term reliability in lithium-ion and emerging battery technologies.

Participants will gain hands-on expertise in battery management systems (BMS), fault detection algorithms, and data-driven performance evaluation. The course integrates real-world applications, including EV battery testing, grid-scale storage systems, and industrial power solutions. By leveraging AI-powered diagnostics, IoT-enabled monitoring, and advanced analytics, this program prepares learners to tackle modern energy challenges and drive innovation in battery technology.

Programme Curriculum

Battery Performance Testing and Diagnostics Training Course

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Course Duration

5 days

Course Objectives

1. Understand battery chemistry fundamentals and performance metrics
2. Analyze state-of-health (SOH) and state-of-charge (SOC) using modern tools
3. Implement advanced battery diagnostics techniques
4. Apply predictive maintenance strategies using AI and machine learning
5. Evaluate thermal management systems for battery safety
6. Conduct real-time battery monitoring using IoT technologies
7. Perform fault detection and failure analysis in battery systems
8. Optimize battery lifecycle management for sustainability
9. Use data analytics and visualization tools for performance insights
10. Understand EV battery testing standards and protocols
11. Design and evaluate battery management systems (BMS)
12. Conduct high-voltage safety and risk assessments
13. Develop energy storage optimization strategies for renewable integration

Target Audience

1. Electrical and Electronics Engineers
2. Renewable Energy Professionals
3. EV Technicians and Automotive Engineers
4. Maintenance and Reliability Engineers
5. Energy Storage System Designers
6. Research Scientists and Academics
7. Quality Assurance and Testing Engineers
8. Technical Managers and Project Leaders

Course Modules

Module 1: Battery Fundamentals

- Battery types and chemistries
- Electrochemical principles
- Performance parameters
- Charging/discharging cycles
- Case Study: Lithium-ion vs Lead-acid comparison

Module 2: Battery Performance Metrics

- Capacity measurement

- Energy density analysis
- Efficiency calculations
- Degradation patterns
- Case Study: EV battery performance benchmarking

Module 3: State Estimation Techniques

- SOC estimation methods
- SOH evaluation models
- Kalman filtering
- Data-driven estimation
- Case Study: SOC accuracy in EV systems

Module 4: Battery Management Systems (BMS)

- BMS architecture
- Cell balancing techniques
- Communication protocols
- Safety controls
- Case Study: Smart BMS in electric vehicles

Module 5: Diagnostics and Fault Detection

- Fault identification methods
- Signal analysis
- Pattern recognition
- Root cause analysis
- Case Study: Battery failure investigation

Module 6: Thermal Management

- Heat generation mechanisms
- Cooling techniques
- Thermal modeling
- Safety implications
- Case Study: Thermal runaway prevention

Module 7: Testing Standards and Protocols

- International standards
- Test procedures
- Compliance requirements
- Certification processes
- Case Study: IEC battery testing standards

Module 8: Data Acquisition and Monitoring

- Sensor technologies
- Data logging systems
- IoT integration
- Real-time monitoring
- Case Study: Smart battery monitoring systems

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