Smart Charging 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

Smart Charging Systems Training Course provides a practical and future-focused foundation in electric vehicle (EV) charging infrastructure, intelligent energy management, grid integration, and connected charging technologies. As EV adoption accelerates, smart charging is becoming an important mechanism for managing charging demand, reducing peak loads, integrating renewable energy, and improving the flexibility of electricity systems. Modern charging ecosystems increasingly combine EVSE, charging station management systems (CSMS), OCPP, ISO 15118, Plug & Charge, dynamic load management, demand response, distributed energy resources (DER), and data-driven energy optimization. OCPP 2.1 adds capabilities for ISO 15118-20 bidirectional charging, DER control, and enhanced smart charging, while ISO 15118-20 provides a foundation for bidirectional power transfer.

The course also explores the rapidly developing Vehicle-to-Grid (V2G), Vehicle-to-Home (V2H), Vehicle-to-Everything (V2X), AI-enabled charging optimization, renewable-energy integration, cybersecurity, interoperability, and battery-aware charging strategies. Current industry analysis highlights smart charging and bidirectional charging as tools for load shifting, grid flexibility, and potentially new revenue opportunities, while interoperability and implementation consistency remain important challenges. Through technical demonstrations, scenario-based exercises, and case studies, participants learn how to design, evaluate, operate, and optimize scalable, secure, interoperable, and grid-responsive charging ecosystems.

Programme Curriculum

Smart Charging Systems Training Course

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Course Duration

5 days

Course Objectives

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

1. Understand smart EV charging architecture, EVSE components, and connected charging ecosystems.
2. Evaluate AC, DC, fast, ultra-fast, wireless, and bidirectional charging technologies.
3. Apply OCPP 2.0.1/2.1 concepts to charging-station and CSMS communication.
4. Explain ISO 15118, Plug & Charge, and V2G communication principles.
5. Design dynamic load management strategies for charging networks.
6. Apply AI and machine learning concepts to charging-demand forecasting and optimization.
7. Integrate solar PV, battery energy storage, and distributed energy resources (DER) with EV charging.
8. Develop V1G smart charging and V2X/V2G operational strategies.
9. Assess grid impact, peak-demand management, demand response, and flexibility services.
10. Identify cybersecurity, data protection, authentication, and PKI considerations.
11. Evaluate interoperability, standards compliance, testing, and conformance requirements.
12. Analyze energy costs, charging economics, battery degradation, and techno-economic performance.
13. Develop future-ready smart charging deployment and digitalization strategies.

Target Audience

1. EV charging infrastructure engineers
2. Electrical and power systems engineers
3. Energy managers and sustainability professionals
4. EV fleet and mobility managers
5. Utility and grid-planning professionals
6. Renewable-energy and energy-storage specialists
7. Charging-network operators and technology providers
8. Project managers, consultants, policymakers, and clean-energy entrepreneurs

Course Modules

Module 1: Smart Charging Fundamentals & EV Charging Ecosystems

- Smart charging architecture
- AC/DC charging
- Connected charging
- Intelligent load management.
- **Case study:** Designing a smart charging strategy for a commercial EV fleet depot.

Module 2: EVSE, Charging Infrastructure & Grid Integration

- EVSE design
- Grid integration
- Dynamic power allocation
- Site energy management
- **Case study:** Optimizing a workplace charging hub with limited electrical capacity.

Module 3: OCPP, ISO 15118 & Interoperability

- OCPP 2.0.1/2.1
- ISO 15118
- Plug & Charge.
- Interoperability.
- **Case study:** Diagnosing an interoperability problem between EVs, chargers, and a CSMS.

Module 4: Smart Charging Optimization, AI & Data Analytics

- Charging forecasting
- AI/ML optimization.
- Dynamic tariffs.
- Peak shaving.
- **Case study:** Developing an AI-assisted charging schedule for a multi-vehicle fleet.

Module 5: V1G, V2G, V2H & V2X Bidirectional Charging

- V1G smart charging.
- V2G.
- V2H/V2B.
- V2X energy management
- **Case study:** Evaluating a V2G fleet for peak-demand reduction and grid services.

Module 6: Renewable Energy, Battery Storage & Energy Management

- Solar-powered charging.
- Battery energy storage systems (BESS)
- Renewable-energy forecasting
- Microgrids.
- **Case study:** Designing a solar-plus-storage EV charging microgrid.

Module 7: Cybersecurity, Safety, Standards & Compliance

- EV charging cybersecurity
- PKI and digital certificates.
- Secure protocols
- Standards and conformity.

- **Case study:** Building a cybersecurity and compliance framework for a connected charging network.

Module 8: Business Models, Deployment Strategy & Future Smart Charging

- Charging economics.
- Demand-response business models.
- Fleet electrification
- Scalable deployment
- **Case study:** Creating a business and implementation roadmap for a regional smart charging network.

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
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:

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