Demand Response Program Design 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

Demand Response Program Design Training Course provides a practical, strategic, and technology-focused understanding of how utilities, energy retailers, aggregators, grid operators, and large energy consumers can design, implement, and optimize demand response (DR) programs. The course explores grid flexibility, load management, peak demand reduction, distributed energy resources (DERs), smart grids, advanced metering infrastructure (AMI), demand-side management (DSM), dynamic pricing, time-of-use tariffs, automated demand response (ADR), energy storage, electric vehicles (EVs), and flexible loads. Participants learn how to develop customer-centric DR strategies that improve grid reliability, reduce system costs, manage peak loads, integrate renewable energy, and support the transition toward decarbonized, resilient, and digitally enabled energy systems.

Through real-world case studies, program design exercises, market examples, and implementation frameworks, participants will learn how to move from DR opportunity assessment to program architecture, customer segmentation, incentive design, measurement and verification (M&V), technology deployment, performance analytics, and continuous optimization. The course emphasizes emerging AI-enabled demand forecasting, machine learning, IoT-connected devices, virtual power plants (VPPs), flexibility markets, prosumer engagement, grid-interactive efficient buildings (GEBs), battery energy storage systems (BESS), EV managed charging, and distributed flexibility. It equips professionals with the tools required to create scalable Demand Response programs that deliver measurable economic, operational, reliability, sustainability, and grid modernization outcomes.

Programme Curriculum

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Course Duration

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Course Objectives

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

1. Design end-to-end Demand Response programs aligned with utility, market, and grid objectives.
2. Analyze peak demand, load profiles, flexibility potential, and customer consumption patterns.
3. Develop effective demand-side management and load flexibility strategies.
4. Segment customers using data analytics, behavioral insights, and energy-use characteristics.
5. Design dynamic pricing, time-of-use, critical peak pricing, and incentive-based DR mechanisms.
6. Evaluate DERs, battery storage, EVs, smart appliances, and flexible loads as demand response resources.
7. Apply automated demand response, AMI, IoT, smart meters, and advanced control technologies.
8. Establish robust measurement, verification, baseline, and performance assessment frameworks.
9. Develop customer engagement strategies that improve DR participation, retention, and response performance.
10. Evaluate the financial, operational, environmental, and reliability benefits of DR programs.
11. Integrate renewable energy, VPPs, and distributed flexibility into modern DR portfolios.
12. Apply AI, machine learning, forecasting, and advanced analytics to DR optimization.
13. Develop an actionable Demand Response program roadmap, business case, and implementation strategy.

Target Audience

1. Utility and electricity distribution professionals
2. Energy managers and facility managers
3. Grid operators and system planners.
4. Energy retailers, aggregators, and demand response service providers.

5. Renewable energy, battery storage, and distributed energy resource professionals.
6. Smart grid, AMI, IoT, and energy technology specialists.
7. Energy consultants, regulators, policymakers, and sustainability professionals.
8. Engineers, project managers, analysts, and executives

Course Modules

Module 1: Demand Response Fundamentals and Energy Market Evolution

- Demand Response concepts, principles, terminology, and market drivers
- Demand-side management versus energy efficiency and load shifting
- Peak shaving, load shifting, load shedding, and load modulation
- Reliability, resilience, affordability, and grid flexibility
- Global Demand Response market trends and emerging business models
- Case Study: Utility Peak-Demand Management

Module 2: Demand Response Program Planning and Opportunity Assessment

- DR potential assessment and flexible-load identification
- Customer load profiling and peak demand analytics
- Technical, economic, and operational feasibility assessment
- Identification of high-value flexible loads
- Developing DR program objectives, KPIs, and implementation roadmaps
- Case Study: Commercial Load Flexibility Assessment

Module 3: Customer Segmentation, Engagement, and Participation Strategy

- Residential, commercial, industrial, and C&I customer segmentation
- Customer behavioral analytics and prosumer engagement
- Participation barriers, customer incentives, and retention strategies
- Digital engagement through mobile platforms, smart meters, and customer portals
- Designing customer-centric DR propositions and communication campaigns
- Case Study: Residential Smart Thermostat Program

Module 4: DR Program Architecture, Tariffs, and Incentive Design

- Time-of-use (TOU), critical peak pricing (CPP), and real-time pricing (RTP)
- Incentive-based Demand Response and capacity payment mechanisms
- Direct load control and interruptible-load programs
- Program eligibility, enrollment, dispatch, and settlement structures
- Designing cost-effective and scalable DR incentives
- Case Study: Critical Peak Pricing Program

Module 5: Smart Grid, DERs, Automation, and Enabling Technologies

- Advanced Metering Infrastructure (AMI) and smart-meter data
- Automated Demand Response (ADR) and distributed controls
- IoT, smart buildings, connected devices, and digital energy platforms
- Battery Energy Storage Systems (BESS) and flexible generation
- Electric vehicle managed charging and vehicle-to-grid (V2G) applications
- Case Study: EV Managed Charging

Module 6: Measurement, Verification, Data Analytics, and Performance Management

- Developing Demand Response baselines and counterfactual consumption models
- Measurement and Verification (M&V) principles and methodologies
- Load forecasting and event-performance analytics
- AI and machine learning for demand prediction and flexibility optimization
- DR performance KPIs, reporting, settlement, and continuous improvement
- Case Study: Industrial DR Verification

Module 7: Renewable Integration, VPPs, Flexibility Markets, and Grid Services

- Integrating solar PV, wind, storage, EVs, and flexible demand
- Virtual Power Plants (VPPs) and distributed flexibility aggregation
- Renewable intermittency and demand flexibility management
- Ancillary services, capacity markets, and balancing services
- Emerging flexibility markets and transactive energy models
- Case Study: Virtual Power Plant Portfolio

Module 8: Business Case, Implementation, Regulation, and Future DR Strategies

- DR program economics, ROI, cost-benefit analysis, and avoided-cost valuation
- Regulatory, market, cybersecurity, privacy, and interoperability considerations
- Program implementation, governance, procurement, and stakeholder management
- Scaling DR through AI, digital twins, automation, and advanced analytics
- Developing a long-term grid flexibility and energy-transition roadmap
- Case Study: Utility-Wide DR Transformation

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

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