Small Hydropower Development 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

Small Hydropower Development Training Course is designed to equip professionals with the knowledge and skills required to identify, assess, design, finance, develop, operate, and manage small hydropower projects. The course addresses the complete project lifecycle from hydrological assessment, site identification and feasibility studies through hydraulic engineering, turbine selection, electrical systems, grid integration, environmental and social safeguards, permitting, project finance, construction, commissioning, and asset management. Current industry training increasingly emphasizes integrated “water-to-wires” understanding, equipment and engineering, environmental considerations, licensing, water management, markets, dam safety, and reliability/asset management.

With growing interest in renewable energy, energy access, climate-resilient infrastructure, decentralized generation, mini-grids, rural electrification, energy security, and low-carbon development, small hydropower can provide dependable electricity while supporting productive economic activity in underserved communities. Contemporary development initiatives are also placing greater emphasis on environmental impact assessment, environmental flows, cumulative impacts, improved hydrological data, water-energy-agriculture nexus planning, innovation, and post-commissioning monitoring. Through interactive lectures, technical exercises, feasibility case studies, group projects, simulations, field-oriented assignments, and expert discussions, participants will develop the confidence to translate hydropower potential into technically sound, financially viable, environmentally responsible, and bankable projects.

Programme Curriculum

Small Hydropower Development Training Course

Introduction

Small Hydropower Development Training Course is designed to equip professionals with the knowledge and skills required to identify, assess, design, finance, develop, operate, and manage small hydropower projects.

The course addresses the complete project lifecycle from hydrological assessment, site identification and feasibility studies through hydraulic engineering, turbine selection, electrical systems, grid integration, environmental and social safeguards, permitting, project finance, construction, commissioning, and asset management. Current industry training increasingly emphasizes integrated “water-to-wires” understanding, equipment and engineering, environmental considerations, licensing, water management, markets, dam safety, and reliability/asset management.

With growing interest in renewable energy, energy access, climate-resilient infrastructure, decentralized generation, mini-grids, rural electrification, energy security, and low-carbon development, small hydropower can provide dependable electricity while supporting productive economic activity in underserved communities. Contemporary development initiatives are also placing greater emphasis on environmental impact assessment, environmental flows, cumulative impacts, improved hydrological data, water-energy-agriculture nexus planning, innovation, and post-commissioning monitoring. Through interactive lectures, technical exercises, feasibility case studies, group projects, simulations, field-oriented assignments, and expert discussions, participants will develop the confidence to translate hydropower potential into technically sound, financially viable, environmentally responsible, and bankable projects.

Course Duration

5 days

Course Objectives

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

1. Assess small hydropower potential using hydrological, topographical, geological, and energy-resource data.
2. Conduct site identification, screening, and prefeasibility assessment for SHP projects.
3. Apply hydrological modelling and flow-duration analysis to estimate dependable water resources.
4. Develop preliminary hydraulic designs, including intake, waterways, penstocks, powerhouse, and tailrace systems.
5. Select appropriate turbine, generator, control, protection, and balance-of-plant technologies.
6. Evaluate grid-connected, isolated-grid, mini-grid, and hybrid renewable-energy configurations.
7. Prepare technical, economic, financial, and bankability assessments for SHP investments.
8. Understand environmental and social safeguards, environmental flows, stakeholder engagement, and climate resilience.
9. Navigate licensing, permitting, regulatory compliance, land, water, and grid-connection requirements.
10. Develop CAPEX, OPEX, tariff, revenue, risk, and financial-model assumptions for project appraisal.
11. Plan procurement, construction, commissioning, quality assurance, and project delivery.
12. Apply modern asset management, predictive maintenance, reliability engineering, digital monitoring, and performance optimization.
13. Develop an integrated SHP project development roadmap capable of supporting investment decisions and sustainable implementation.

Target Audience

1. Hydropower and renewable-energy engineers
2. Civil, electrical, mechanical, hydraulic, and environmental engineers
3. Energy project developers and independent power producers
4. Government ministries, regulators, utilities, and energy agencies
5. Project managers, consultants, EPC contractors, and technical advisors

6. Banks, investors, development-finance institutions, and infrastructure financiers
7. NGOs, development organizations, researchers, and academic institutions
8. Entrepreneurs and professionals working in rural electrification, mini-grids, and sustainable energy

Course Modules

Module 1: Small Hydropower Fundamentals and Project Development

- SHP fundamentals
- Project lifecycle
- Water-to-wire concept
- Site screening
- **Case Study: Rural electrification SHP project**

Module 2: Hydrology, Site Assessment and Resource Evaluation

- Hydrological assessment
- Flow-duration curves
- Topographical and geological investigations
- Climate resilience
- **Case Study: Data-limited African river basin**

Module 3: Hydraulic and Civil Engineering Design

- Hydraulic structures
- Hydraulic calculations
- Powerhouse design
- Sediment management
- **Case Study: Run-of-river project**.

Module 4: Turbines, Generators, Controls and Grid Integration

- Turbine selection
- Electromechanical systems
- Digital controls
- Grid integration
- **Case Study: Variable-flow SHP plant**

Module 5: Feasibility Studies, Economics and Project Finance

- Technical feasibility
- Economic analysis.
- Financial modelling
- Risk and bankability
- **Case Study: Investor appraisal of an SHP project**

Module 6: Environmental, Social, Regulatory and Climate Considerations

- Environmental impact assessment
- Environmental flows
- Social safeguards
- Licensing and permitting.

- **Case Study: Cascade SHP development**.

Module 7: Construction, Procurement, Commissioning and Operations

- EPC/project delivery
- Construction management
- Commissioning
- Operations and maintenance
- **Case Study: Aging small hydropower asset**

Module 8: Asset Management, Digitalization and Sustainable SHP Development

- Asset management
- Digital hydropower
- Performance optimization
- Sustainable development.
- **Case Study: Integrated SHP investment project**.

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:

Register Online Now

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