Renewable Modelling and Analysis Training Course

Professional Development Training Course Outline

Category	Project Management	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The global transition toward clean energy has created a growing demand for professionals with skills in renewable modelling and analysis. Renewable Modelling and Analysis Training Course is designed to equip participants with cutting-edge techniques and tools necessary to model, simulate, and analyze renewable energy systems. The course emphasizes solar, wind, and hybrid energy systems while integrating predictive analytics, machine learning applications, and sustainability forecasting to develop scalable and efficient renewable solutions.

With a focus on both theoretical concepts and practical implementations, this course empowers participants to handle real-world projects and optimize energy outputs through smart grid integration, policy-driven modeling, and financial viability assessments. Professionals in the renewable energy sector will gain the competence needed to support green transitions using data-driven decision-making and advanced modelling platforms.

Programme Curriculum

Renewable Modelling and Analysis Training Course

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Course Objectives

1. Understand the fundamentals of renewable energy modelling and simulation.
2. Apply data-driven forecasting techniques in renewable energy analysis.
3. Utilize tools like HOMER, PVsyst, MATLAB, and RETScreen for system design and analysis.
4. Perform economic feasibility studies for solar and wind energy systems.
5. Analyze grid integration challenges of renewable energy systems.
6. Integrate AI and machine learning in energy consumption prediction models.
7. Evaluate energy storage systems using performance-based modelling.
8. Develop hybrid renewable systems for off-grid and grid-connected setups.
9. Assess the environmental and carbon impact of renewable technologies.
10. Interpret geospatial and meteorological data for site-specific energy planning.
11. Perform policy and regulatory compliance modelling in project design.
12. Build and present simulation models and dashboards for reporting.
13. Implement scenario analysis for risk management in energy planning.

Target Audiences

1. Renewable Energy Engineers
2. Environmental Scientists and Analysts
3. Utility and Energy Managers
4. Urban Planners and Infrastructure Developers
5. Policy Makers and Regulatory Authorities
6. Energy Consultants and Sustainability Experts
7. Graduate Students in Energy Studies
8. Project Developers and Investors in Clean Energy

Course Duration: 5 days

Course Modules

Module 1: Fundamentals of Renewable Energy Modelling

- Introduction to energy systems and modelling needs
- Overview of renewable resources and variability
- Understanding load profiles and energy balance
- Key metrics and modelling indicators
- Tools and software overview
- **Case Study:** Baseline modelling for a rural solar PV project

Module 2: Solar Energy System Simulation

- Introduction to PV system design
- PVsyst software walkthrough
- Solar radiation data interpretation
- PV performance ratio analysis
- Panel orientation and tilt modelling
- **Case Study:** PV system design for a university campus

Module 3: Wind Energy Modelling and Analysis

- Wind resource assessment tools
- Turbine selection and site evaluation
- Wind speed data and Weibull distribution
- Wind farm layout modelling
- Software: WindPRO/WAsP

- **Case Study:** Community wind farm feasibility

Module 4: Hybrid Renewable Systems Design

- Concept of hybrid energy systems
- System sizing and component selection
- HOMER Pro modelling workflow
- Load prioritization in hybrid systems
- Economic optimization and LCOE analysis
- **Case Study:** Off-grid hybrid system for an island village

Module 5: Energy Storage and Grid Integration

- Types and roles of energy storage systems
- Battery modelling and simulation
- Grid stability and synchronization
- Smart grid integration tools
- Demand-side management modelling
- **Case Study:** Storage-integrated solar project in an urban grid

Module 6: Machine Learning in Renewable Forecasting

- Introduction to AI in energy
- Data preprocessing and model selection
- Time-series forecasting models (ARIMA, LSTM)
- Python for predictive modelling
- Accuracy metrics and model tuning
- **Case Study:** ML-based solar output prediction for a smart city

Module 7: Environmental Impact and Policy Modelling

- Carbon emissions modelling
- Lifecycle assessment (LCA)
- Policy frameworks and compliance standards
- RETScreen policy analysis tool
- Impact of incentives and tariffs
- **Case Study:** Carbon impact modelling for wind farms under new tax laws

Module 8: Project Development and Simulation Reporting

- Project planning and scheduling
- Financial modelling for renewable projects
- Report automation and dashboards
- Stakeholder presentation skills
- Scenario and risk analysis techniques
- **Case Study:** Full-scale simulation and investment pitch for a solar farm

Training Methodology

- Instructor-led online & in-person sessions
- Hands-on workshops using software tools (PVsyst, HOMER, RETScreen)
- Real-world datasets and modelling assignments
- Group projects and peer reviews
- Simulation-based performance evaluations
- Access to a cloud-based lab environment

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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