

Grid Integration of Renewable Energy Systems (Solar, Wind & Hydro)

COURSE OVERVIEW

The course provides extensive knowledge of the technical, regulatory and operational aspects of integrating renewable energy sources into modern power grids. It explores grid codes, system stability, energy storage solutions, power quality challenges and advanced control strategies required to manage variable renewable energy generation. Through case studies and real-world applications, delegates will gain practical insights into designing, operating and optimizing renewable energy systems for reliable and efficient grid performance.

WHO SHOULD ATTEND?

This course is intended for energy professionals, grid operators, utility managers, renewable project developers, power engineers, regulators and policymakers involved in the planning, operation and management of renewable energy integration into national or regional grids. It is also beneficial for researchers, consultants and technical staff seeking to deepen their expertise in renewable energy grid integration.

COURSE OUTCOMES

Delegates will gain the skills and knowledge to:

- Understand the principles and challenges of integrating solar, wind, and hydro systems into the power grid.
- Analyze the impact of variable renewable energy on grid stability, reliability, and power quality.
- Apply grid codes, standards, and regulatory frameworks for renewable energy integration.
- Evaluate storage and hybrid solutions for balancing intermittent energy supply.
- Develop strategies to optimize grid performance with high penetration of renewables.
- Design smart grid solutions for efficient renewable integration and demand management.

KEY COURSE HIGHLIGHTS

At the end of the course, you will understand;

- Fundamental principles of connecting solar, wind, and hydro power to the electrical grid.
- Technologies enabling safe and efficient interconnection, including inverters and transformers.
- Modernizing grid infrastructure to manage bidirectional flows and variability of renewable resources.
- Operational strategies such as forecasting, energy storage, and demand response to balance supply and demand.
- Regulatory frameworks and standards that govern renewable energy integration.
- Advanced control systems and smart grid technologies to maintain grid stability and reliability with high renewable penetration.

All our courses are dual-certificate courses. At the end of the training, the delegates will receive two certificates.

1. A GTC end-of-course certificate
2. Continuing Professional Development (CPD) Certificate of completion with earned credits awarded