



About the Course

With the ever-increasing demand for electric power and imminent exhaustion of fossil fuels, tapping the renewable energy sources for power generation seems the most obvious solution to bridge the demand and supply gap. This course on Renewable Energy and Power Evacuation discusses the available Renewable Energy options and the challenges faced in harnessing the power from these sources. The course further elaborates on how to generate power from solar and wind power plants commercially and technologically viable. The learner is taken through the various energy-storage technologies available with specific detailing on battery technology and its advancements. Case Studies on large scale implementation of solar plants and wind power plants are deliberated using software tools like PVSyst and SAM. Do it yourself problem statements from industry on Solar PV design using MATLAB/PVSyst/SAM is also provided to the learners to get hands on experience on the subject.



Key Topics

Need for Sustainability | Various forms of Renewable Energy | Solar Power Generation | Solar Power Sizing | Solar Power Case Study | Wind Power Generation | Wind Power Sizing | New Developments in Solar & Wind Energy | Storage of Reliable Renewable Power | Type of Batteries & Super Capacitors, Battery & Storage Sizing | Hydrogen as an energy storage medium | Impact of Renewable Power on Grid | Renewable Economy & need for Flexible AC Transmission (FACTS)



Course Objectives

Main aim of this course is to

- ▶ Create an awareness and understanding of the Fossil fuel dependency in current power generation scenario and the need to migrate to cleaner and renewable energy sources
- ▶ Explain various forms of renewable energy
- ▶ Illustrate the design aspects involved in renewable power generation, especially from Solar and wind energy Sources
- ▶ Illustrate the energy storage strategies including Battery and Hydrogen storage
- ▶ Illustrate how grid Integration is done for the energy generated from Renewable Energy Sources
- ▶ Demonstrate the evolution in Smart systems leading way to power consumers becoming producers.

Learning Outcomes

At the end of this course, learners will be able to

- ▶ Outline the need for renewable energy resources for sustainable future
- ▶ Explain the evolution of renewable energy generation and new developments
- ▶ Design and model the complete photovoltaic system including selection of PV panels, inverter sizing, battery sizing for a specific requirement by using manual method as well as software
- ▶ Design and model of wind power generation for a specific requirement including component selection and explore various wind technologies
- ▶ Demonstrate the integration of renewable energy sources with the power grid, analyse the impact of renewable power in grid and also the mitigation measures
- ▶ Illustrate the storage technologies of electrochemical, mechanical, thermal etc.,
- ▶ Design and model lead acid battery sizing for a substation using IEEE standards
- ▶ Analyse the solar and wind power generation using software MATLAB, PVSyst and SAM