



*Training Course:
Solar Energy System Design*

6 - 10 April 2025

Cairo (Egypt)

Holiday Inn & Suites Cairo Maadi, an IHG Hotel

Training Course: Solar Energy System Design

Training Course code: EN234720 From: 6 - 10 April 2025 Venue: Cairo (Egypt) - Holiday Inn & Suites Cairo Maadi, an IHG Hotel Training Course Fees: 4200 € Euro

Introduction

Solar Energy System Design builds upon the introduction to PV systems from Solar Energy Basics course, which included basic system components and functions, as well as some basic system sizing using simplifying assumptions. You should at this point have a basic understanding of electrical power and energy, be able to calculate the energy needs of a site as well as energy production potential for a PV system at a given location under optimal conditions. Much of this course will focus on incorporating on the ground conditions into energy production considerations, and how to account for these conditions in system design and equipment selection. By the end of this course you should be able to incorporate losses in irradiance due to array setups with less than optimal positioning and/or shading, and account for variations in module output due to temperature variations in your system design.

Course objectives

- ▣ World Energy Scenario, Renewable Energy Technologies, Role of Solar PV,
- ▣ Introduction to Solar Radiation, Optimum orientation of Solar PV modules, Solar related measuring devices
- ▣ Solar PV Electricity, Interconnections of PV Modules, Impact of environmental parameters on module performance
- ▣ Introduction to Battery technologies, Charge controller, MPPT, Solar PV inverters
- ▣ Types of Solar PV systems, Introduction to Solar PV system design
- ▣ Grid Solar PV system design with DC load, Grid Solar PV system design with water pump, Example of Solar Power packs for homes/ industrial applications, Example of Solar Power packs for homes/ industrial applications
- ▣ Design of Grid, Connected Solar PV systems
- ▣ Wires and Cable sizing, Junction Boxes, Combiner Boxes, Fuses.
- ▣ Solar PV system Installation, Monitoring and Trouble Shooting, Introduction to Solar lamps, Solar Products available in the market

Target Audience

- Electrical engineers
- Project managers
- Professionals who wants to expands their knowledge in PV technologies.

Course Outline

Day1

Following solar energy from source to panel

- The Sun and the Solar Spectrum
- The Sun-Earth Relationship
- The Sun and Atmosphere
- Solar Irradiance
- Finding Solar Insolation
- Using Insolation Data
- Insolation to PV Energy

Day 2

PV module and array circuits

- Electricity and Circuits
- The PV Circuit
- Measuring power in a PV circuit
- PV and Electrical Interactions- Efficiencies from cell to array
- Electrical characteristics in PV arrays- Variations in productivity

Day 3

PV sizing and output under different conditions

- PV Sizing and Output
- Orientation and Tilt
- Temperature Dependent Output
- Temperature Dependent Output as a Percent
- Measuring Shading at a Site
- Analyzing Shading and Calculating Insolation
- PV Output Reduction Due to Shading

Day 4

Grid-tie PV System design under real world conditions

- Residential Site Survey
- Array Sizing and Module Selection
- Inverter Sizing and Selection
- String sizing for the inverter

Day 5

Faults conditions and maintenance

- What are the faults that occurs in the PV systems?
- Types of faults and fault analysis
- Maintenance of the PV systems

Registration form on the Training Course: Solar Energy System Design

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