

Solar Energy System – Installation and Storage

Course: **00181**

Filter: **Beginner**

Duration: **3 days**

Category: **Electrical Safety**

Price: **606,00 €**

About Course

This intensive and practical training program equips participants with a solid foundation in solar photovoltaic (PV) technologies and the skills needed to design, install, and maintain solar energy systems for residential, commercial, and industrial applications. By combining technical depth with real-world application, this course covers the entire solar energy value chain — from understanding solar radiation and PV system components to advanced design techniques, grid integration, cost optimization, safety standards, and environmental impact assessment. Participants will gain the capability to manage renewable energy projects, reduce operational costs, and contribute meaningfully to the clean energy transition

What you'll learn

- Core principles of solar energy and photovoltaic conversion
- Differences between on-grid and off-grid solar systems
- How to evaluate solar resources based on geographic and atmospheric conditions
- Load analysis and matching for optimal energy efficiency
- System design principles including component sizing, energy storage, and wiring
- Regulatory standards, safety protocols, and electrical codes (e.g., NEC)
- Solar technology innovations, environmental considerations, and future trends
- Maintenance strategies to maximize system performance and lifespan
- Maintenance strategies to maximize system performance and lifespan

Targeted audience

- Engineers (Electrical, Mechanical, Energy, Civil)
- Renewable energy professionals and consultants
- Entrepreneurs and solar system integrators
- Project managers overseeing energy transitions
- Maintenance teams and technical staff
- Anyone seeking to enter the solar energy industry or deepen their expertise

Pre-requisites

None

Curriculum

Module 1: Solar Energy Foundations

- History and global evolution of solar power
- Basics of solar radiation and earth-sun geometry

Module 2: Solar PV System Types

- Off-grid, on-grid, and hybrid systems
- Applications in various sectors

Module 3: Solar Resource Assessment

- Solar mapping, irradiance, and atmospheric effects
- Software tools for solar site evaluation

Module 4: Load and Energy Analysis

- Estimating energy consumption and peak loads
- Matching supply with demand

Module 5: Photovoltaic Technology

- PV cell types, characteristics, and efficiency
- Module selection and performance evaluation

Module 6: Electrical Design for PV Systems

- Circuit design, wiring, inverters, meters
- Voltage drop calculations and NEC compliance

Module 7: Mechanical Design and Installation

- Mounting options, structural loads, roof integration
- Weatherproofing and safety systems

Module 8: Battery Storage and Power Backup

- Types of batteries, sizing, and charge control
- Integration with PV systems

Module 9: System Maintenance and Diagnostics

- Troubleshooting faults and improving performance
- Maintenance schedules and end-user guides

Module 10: Safety, Codes, and Compliance

- Electrical safety, PPE, OSHA standards
- Fire protection and installation regulations

Module 11: Economics of Solar Energy

- ROI analysis, payback period, and system financing
- Cost comparison with traditional energy sources

Module 12: Emerging Trends and Future Outlook

- Technological innovations (e.g., thin-film, bifacial, BIPV)
- The evolving global solar market and Policy land scape