Postgraduate Certificate

Off-Grid Photovoltaic Installation Design

tech global university

tech global university

Postgraduate Certificate
Off-Grid Photovoltaic Installation Design

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Accreditation: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

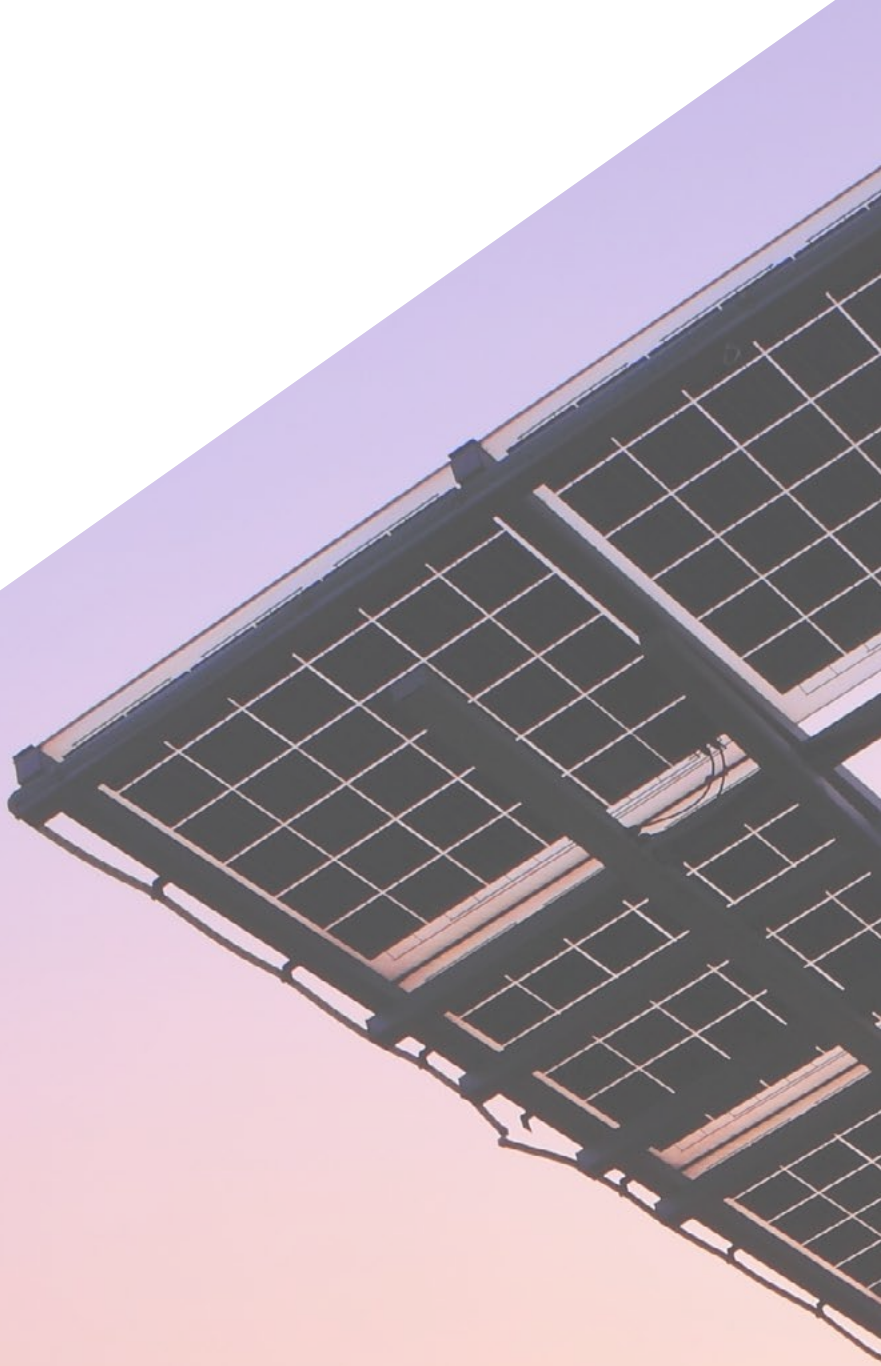
Website: **www.techtitute.com/us/engineering/postgraduate-certificate/off-grid-photovoltaic-installation-design**

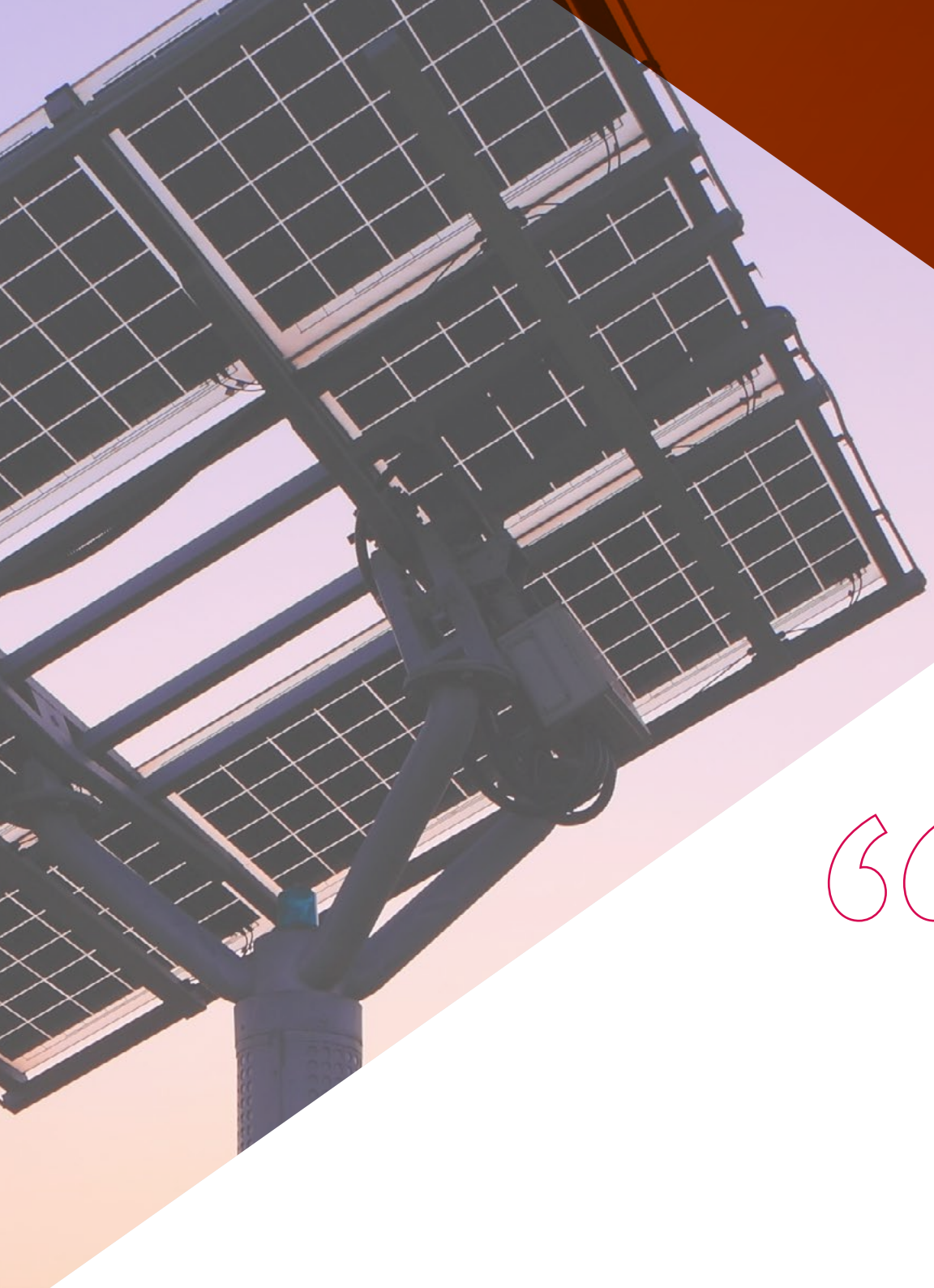
Index

01

Introduction

Off-Grid Photovoltaic System Design represents a highly efficient solution to meet energy needs in remote locations or where grid access is limited or costly. This approach involves not only the integration of advanced photovoltaic technologies, but also careful planning that considers technical, economic and environmental aspects. Given this, engineering professionals need to examine in depth the most innovative methodologies involved in the design of stand-alone PV systems, from the initial assessment of the energy demand to its implementation. For this reason, TECH presents a revolutionary 100% online university program focused on the most sophisticated strategies for the effective implementation of stand-alone Photovoltaic Installations.





With this Postgraduate Certificate based on Relearning, you will design efficient and safe configurations of photovoltaic systems adapted to different environments"

In the current context of energy transition towards renewable sources, Off-Grid Photovoltaic Installations play a crucial role in the provision of energy in remote and decentralized areas. According to recent data from the International Renewable Energy Agency, it is estimated that the installed capacity of off-grid PV systems could reach 60 gigawatts worldwide within the next few years. In view of this, photovoltaic engineers need to equip themselves with the skills required to overcome the challenges associated with the design of these systems.

Against this backdrop, TECH is launching a cutting-edge Postgraduate Certificate on Off-Grid Photovoltaic System Design. The academic itinerary will delve into the functionalities of the components of photovoltaic systems, taking into account factors such as conversion, monitoring and consumption. Thanks to this, graduates will design projects that effectively optimize the generation, storage and distribution of solar energy. In line with this, the syllabus will analyze in detail the coverage of the demand, which will enable professionals to calculate the necessary capacity of the photovoltaic system to meet the energy demand in an efficient manner.

It should be noted that this program is based on a 100% online methodology, which allows students to learn at their own pace. To do so, the only thing they will need to access the resources is a device with an Internet connection. In addition, this program stands out for relying on TECH's innovative Relearning method. This is a teaching model supported by the repetition of the most important content, in order to make the knowledge last in the students' minds. To enrich learning, the materials are complemented by a wide variety of multimedia resources (such as interactive summaries, supplementary readings or infographics) to reinforce knowledge and skills.

This **Postgraduate Certificate in Off-Grid Photovoltaic Installation Design** contains the most complete and up-to-date scientific program on the market. The most important features include:

- The development of case studies presented by experts in Photovoltaic Energy
- The graphic, schematic, and practical contents with which they are created, provide practical information on the disciplines that are essential for professional practice
- Practical exercises where the self-assessment process can be carried out to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

If you have set yourself the goal of updating your knowledge, TECH gives you the opportunity to achieve it while also making it compatible with your professional responsibilities"

You will delve into battery sizing, which will allow you to guarantee a constant and reliable energy supply"

Are you looking for the most innovative strategies to properly calculate solar generators? Achieve it through this very complete program.

You will position yourself in the labor market through this 100% online program, which allows for immersive and solid learning.

The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

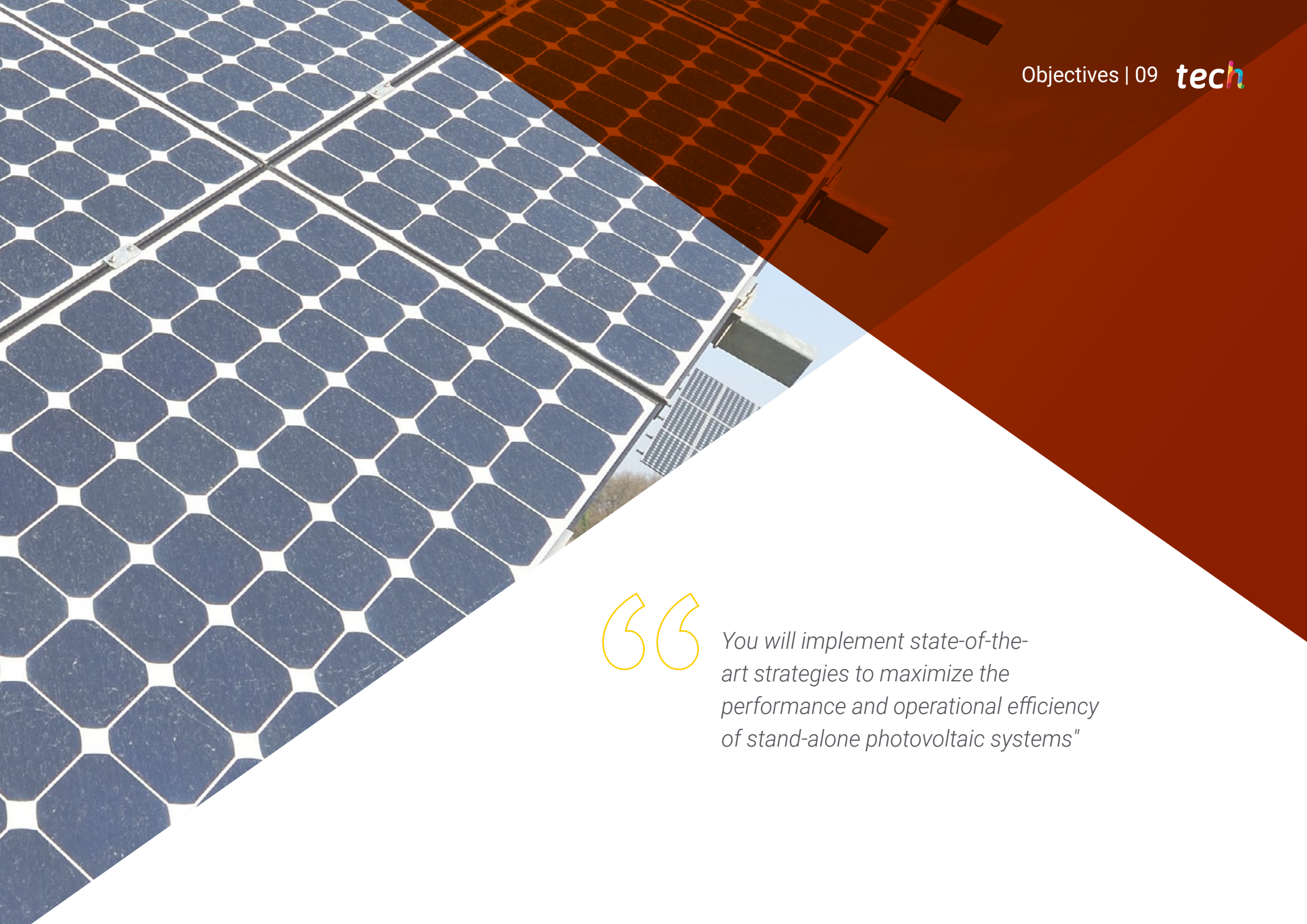
The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to prepare for real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the course. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

Objectives

Through this Postgraduate Certificate, engineers will gain a solid understanding of the various power supply alternatives available, including photovoltaic technologies. In this sense, professionals will acquire advanced skills in both analyzing and forecasting electrical energy consumption patterns that influence the sizing of photovoltaic systems. Along the same lines, graduates will be able to select optimal locations for the installation of systems based on technical, economic and environmental criteria.



You will implement state-of-the-art strategies to maximize the performance and operational efficiency of stand-alone photovoltaic systems"

General Objectives

- Develop a specialized vision of the photovoltaic market and its lines of innovation
- Analyze the typology, components and advantages and disadvantages of all configurations and schemes of large photovoltaic plants
- Specify the typology, components and the advantages and disadvantages of all the configurations and schemes of self-consumption photovoltaic installations
- Examine the typology, components and advantages and disadvantages of all off-grid PV plant configurations and schemes
- Establish the typology, components and the advantages and disadvantages of hybridization of photovoltaic technology with other conventional and renewable generation technologies
- Establish the fundamentals of the operation of the components of the direct current part of the photovoltaic installations
- Understand all the properties of the components
- Establish the fundamentals of the operation of the components of the direct current part of the photovoltaic installations
- Understand all the properties of the components
- Characterize the solar resource on any site in the world
- Handle terrestrial and satellite databases
- Select optimal sites for photovoltaic systems
- Identify other factors and their influence on the photovoltaic installation
- Assess the profitability of investments, operation and maintenance activities and financing of photovoltaic projects
- Identify risks that may affect the viability of investments
- Manage PV projects
- Design and dimensioning of photovoltaic plants, including site selection, sizing of components and their coupling
- Estimate energy yields
- Monitor photovoltaic plants
- Manage health and safety
- Design and dimensioning of self-consumption photovoltaic installations, including site selection, sizing of components and their coupling
- Estimate energy yields
- Monitor photovoltaic installations
- Design and dimensioning of off-grid photovoltaic systems, including site selection, sizing of components and their coupling
- Estimate energy yields
- Monitor photovoltaic installations
- Analyze the potential of PVGIS, PVSYST and SAM software in the design and simulation of photovoltaic installations.
- Simulate, dimension and design photovoltaic installations using the following software: PVGIS, PVSYST and SAM
- Acquire skills in the assembly and commissioning of installations
- Develop specialized knowledge in the operation and preventive and corrective maintenance of the facilities

Specific Objectives

- Selection of the optimal installation components
- Component Sizing
- Control the monitoring of the PV installation
- Ensure that electricity demand is met in quantity and quality

Specialized readings will enable you to further extend the rigorous information provided in this university program"

03

Course Management

TECH strives to offer the most up-to-date university programs, which is why it carefully selects the members of its teaching staff. For the delivery of this Postgraduate Certificate, TECH has enlisted the services of distinguished experts in the field of Off-Grid Photovoltaic Installation Design. These specialists have extensive work experience in internationally renowned institutions. Their experience is reflected in the teaching contents of this course, which are characterized by their high quality. In this way, engineers will have access to an experience that will significantly improve their professional opportunities.

You will have access to a syllabus designed by a recognized teaching team specialized in the Design of Off-Grid Photovoltaic Installations"

Management

Dr. Chicano, Rodrigo

- Academic in Renewable Energy, Madrid
- Energy Consultant at JCM Bluenergy, Madrid
- PhD in Electronics from the University of Alcalá
- Specialist in Renewable Energy from the Complutense University of Madrid
- Master's Degree in Energy from the Complutense University of Madrid
- Degree in Physics from the Complutense University of Madrid

Professors

Ms. Katz Perales, Raquel

- Academic in Renewable Energies, Spain
- Green Infrastructure Project Development at Faktor Gruen, Germany
- Freelance Professional in Green Area Design in the Landscaping, Agriculture and Environment Sector, Valencia
- Agricultural Engineer at Floramedia Spain
- Agricultural Engineer by the Polytechnic University of Valencia
- Degree in Environmental Sciences from the Polytechnic University of Valencia
- BDLA-Green Area Design, Hochschule Weihenstephan-Triesdorf University, Germany

04

Structure and Content

With this program, graduates will master the technological fundamentals of photovoltaic systems generation. The syllabus will focus on the applications of off-grid photovoltaic systems. In this line, the syllabus will analyze the characterization of the demand, taking into account the requirements of quality of service and continuity of supply. In this way, graduates will design systems that maximize efficiency and minimize operating costs. In addition, the teaching contents will go in depth into the Particularization of Direct Current Pumping Installations and will provide examples of Off-Grid Photovoltaic Installations Design.

You will be able to plan the optimal site location to maximize solar energy production"

Module 1. Off-Grid Photovoltaic Installation Design

1.1. Context and Applications of On-Grid Photovoltaic Installations
- 1.1.1. Energy Supply Alternatives
- 1.1.2. Social Aspects
- 1.1.3. Applications

1.2. Characterization of the Demand of On-Grid Photovoltaic Installations
- 1.2.1. Demand Profiles
- 1.2.2. Service Quality Requirements
- 1.2.3. Continuity of Supply

1.3. Settings and Layout of Off-Grid Photovoltaic Installations
- 1.3.1. Location
- 1.3.2. Settings
- 1.3.3. Detailed Schemes

1.4. Component Functionalities of Off-Grid Photovoltaic Installations
- 1.4.1. Generation, Storage, Control
- 1.4.2. Conversion, Monitoring
- 1.4.3. Management and Consumption

1.5. Component Sizing of Off-Grid Photovoltaic Installations
- 1.5.1. Solar Generator-Accumulator-Inverter Sizing
- 1.5.2. Battery Sizing
- 1.5.3. Sizing of Other Components

1.6. Energy Yield Estimation
- 1.6.1. Solar Generator Production
- 1.6.2. Storage
- 1.6.3. Production End Use

1.7. Coverage of Demand
- 1.7.1. Solar Photovoltaic Coverage
- 1.7.2. Auxiliary Generator Coverage
- 1.7.3. Energy Losses

1.8. Demand Management
- 1.8.1. Demand Characterization
- 1.8.2. Demand Modification. Variable Loads
- 1.8.3. Demand Substitution

1.9. Particularization for DC and AC Pumping Installations
- 1.9.1. Storage Alternatives
- 1.9.2. Coupling of Motor- Pump- photovoltaic Generator Group
- 1.9.3. Water Pumping Market

1.10. Design Examples Stand-Alone Photovoltaic Installations
- 1.10.1. Photovoltaic Installation Design for an Individual Off-Grid House
- 1.10.2. Photovoltaic Installation Design for Community Off-Grid Houses
- 1.10.3. Photovoltaic Installation Design and Generator Set for an Individual Off-Grid House

A program designed based on the latest trends and most advanced technologies. Enroll now!"

05

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

> *Our program prepares you to face new challenges in uncertain environments and achieve success in your career"*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

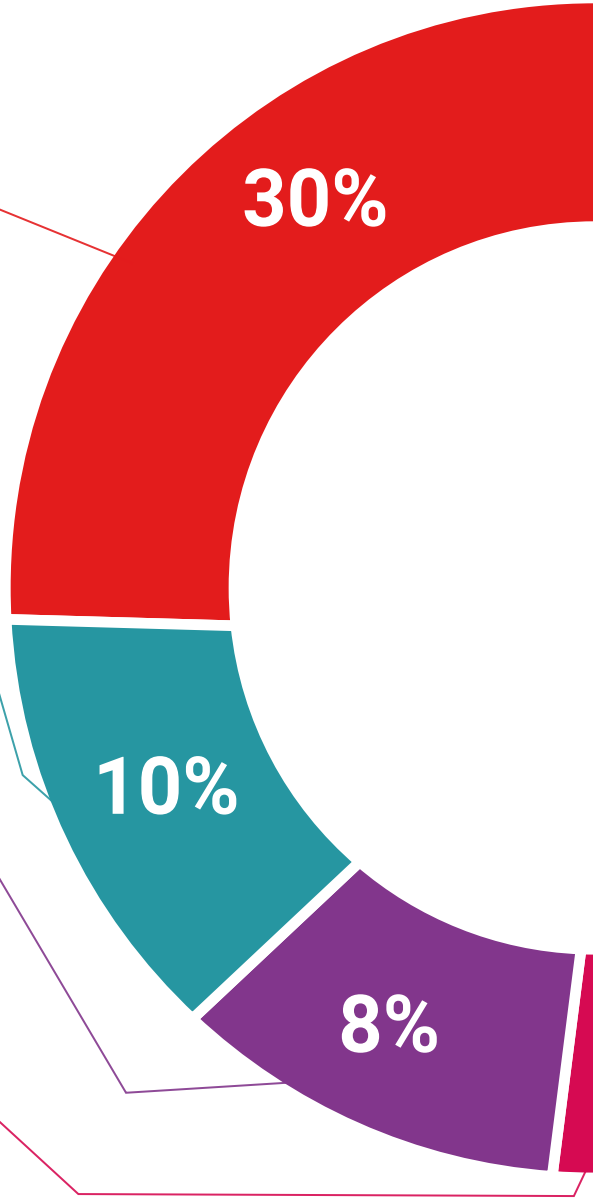
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

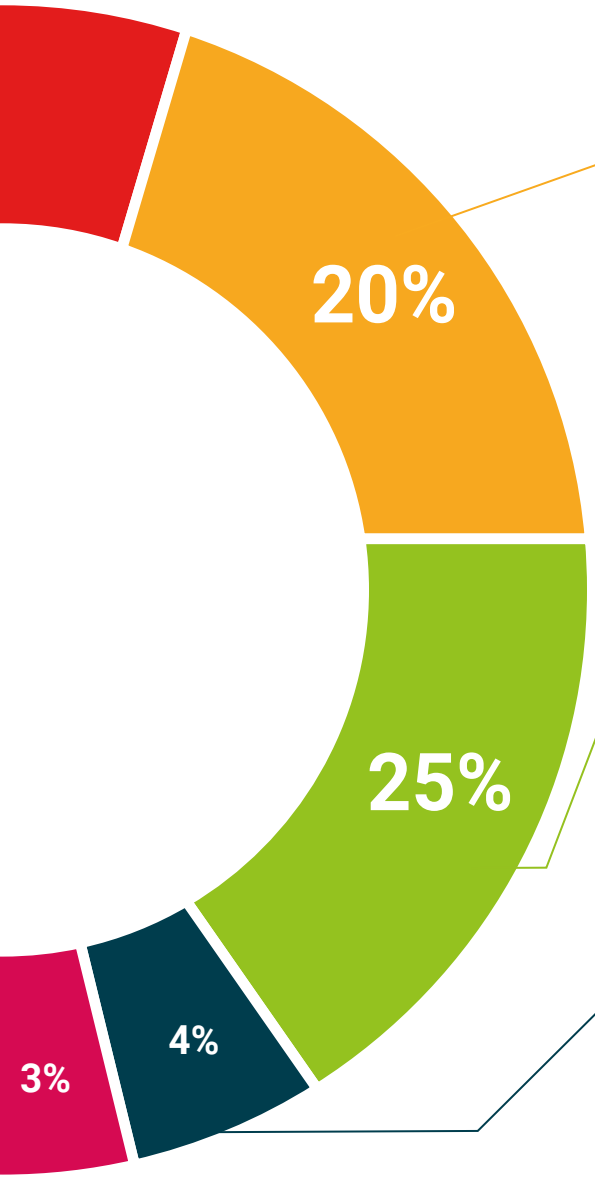
Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

06

Certificate

The Postgraduate Certificate in Off-Grid Photovoltaic Installation Design guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This private qualification will allow you to obtain a **Postgraduate Certificate in Off-Grid Photovoltaic Installation Design** endorsed by **TECH Global University**, the world's largest online university.

TECH Global University, is an official European University publicly recognized by the Government of Andorra ***(official bulletin)***. Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Off-Grid Photovoltaic Installation Design**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

Mr./Ms. _____ with identification document _____
has successfully passed and obtained the title of:

Postgraduate Certificate in Off-Grid Photovoltaic Installation Design

This is a private qualification of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

tech global university

Postgraduate Certificate
Off-Grid Photovoltaic Installation Design

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Accreditation: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Postgraduate Certificate

Off-Grid Photovoltaic Installation Design

tech global university