

Postgraduate Certificate

Self-Consumption Photovoltaic Installation Design



Postgraduate Certificate Self-Consumption Photovoltaic Installation Design

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

Website: www.techtute.com/us/engineering/postgraduate-certificate/self-consumption-photovoltaic-installation-design

Index

01

Introduction

p. 4

02

Objectives

p. 8

03

Course Management

p. 12

04

Structure and Content

p. 16

05

Methodology

p. 20

06

Certificate

p. 28

01

Introduction

The adoption of self-consumption photovoltaic systems has seen significant growth in recent years due to their ability to provide a renewable and decentralized source of energy. Such facilities not only contribute to reducing dependence on fossil fuels, but also provide a sustainable solution for meeting the energy demands of homes, commercial and industrial buildings.

In this context, engineering professionals must remain at the forefront of the most innovative strategies to optimize energy efficiency. To help them with this task, TECH launches a revolutionary university program focused on the latest advances in Self-Consumption Photovoltaic Installation Design. And all in a flexible format 100% online!



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Thanks to this 100% online Postgraduate Certificate, you will be equipped with the necessary skills to overcome complex challenges in the Design of Photovoltaic Installations for Self-consumption"

According to a recent report by the International Energy Agency, the global installed solar PV capacity for self-consumption reached 540 gigawatts during the past year. This growth is largely attributed to the decline in solar panel costs and favourable policies that promote the adoption of renewable energy at the household and industrial levels. Faced with this scenario, engineers need to have an exhaustive knowledge of the most sophisticated techniques to optimize photovoltaic systems for self-consumption.

That's why TECH presents a very complete Postgraduate Certificate in Self-Consumption Photovoltaic Installation Design. Under a practical approach, the academic itinerary will delve into the characterization of demand profiles based on factors such as electrification or alternatives of profile modification. In this way, the graduates will design efficient and sustainable energy systems tailored to the specific needs of users. The syllabus will also include site location and layout selection processes, which will enable professionals to maximize energy output from the facility. The program will also provide students with the most innovative strategies to maximize the profitability of such PV systems.

Thanks to the fact that this program is developed through a 100% online methodology, engineers will have the possibility of managing their own study time to expand their knowledge. In addition, TECH uses its disruptive method of Relearning, based on the repetition of key concepts of the syllabus. This will ensure that students enjoy progressive and natural learning. As such, they will not have to resort to expensive traditional techniques such as memorization. In this sense, the only thing that professionals will need is to have an electronic device with an Internet connection, in order to access the Virtual Campus and enjoy a high-intensity experience that will broaden their work horizons significantly.

This **Postgraduate Certificate in Self-Consumption 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



An educational program that has been designed based on the latest trends in Self-Consumption Photovoltaic Installation Design in order to guarantee you a successful learning"



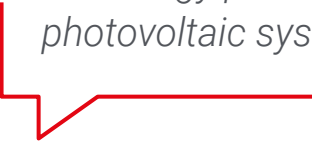
Do you want to incorporate the most sophisticated strategies for Surplus Appraisal into your daily practice? Achieve it with this program in only 180 hours”

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

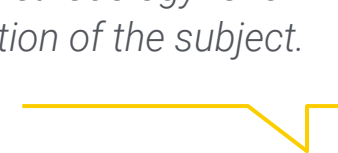
The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive education programmed to prepare for real situations.

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.

You will delve into the optimal orientation of the solar field, which will allow you to maximize the energy performance of your photovoltaic systems.



You will reinforce your key knowledge through the innovative Relearning methodology for an effective assimilation of the subject.



02

Objectives

After completing this Postgraduate Certificate, engineers will master the principles of solar photovoltaic power generation, as well as the components and technologies used in self-consumption systems. Similarly, professionals will develop skills to design photovoltaic systems according to the specific needs of users, considering factors such as energy demand, geographical conditions and system efficiency. In the same line, graduates will be highly qualified to perform financial analysis to assess the feasibility of photovoltaic projects.





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You will acquire skills to manage projects of Self-Consumption Photovoltaic System Installation, ensuring the execution within the deadlines and budgets established”



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
- ◆ Control the monitoring of the PV installation

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You will achieve your goals thanks to TECH's teaching tools, among which stand out explanatory videos, interactive summaries and case studies"

03

Course Management

In its utmost of offering the most up-to-date university programs on the educational market, TECH carries out a rigorous process to constitute its teaching staff. For the delivery of this Postgraduate Certificate, TECH has brought together the best experts in Self-Consumption Photovoltaic Installation Design. These professionals have an extensive professional background, where they have worked in internationally renowned institutions. In this way they have designed a wide range of teaching content, defined by their high quality and full applicability to the demands of the labor market.

In this way, engineers will be immersed in an engaging experience that will optimize their daily practice and improve their job prospects.

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A teaching team specialized in the Self-Consumption Photovoltaic Installation Design will provide you with a quality program with a first class theoretical and practical approach"

Management



Dr. Blasco 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

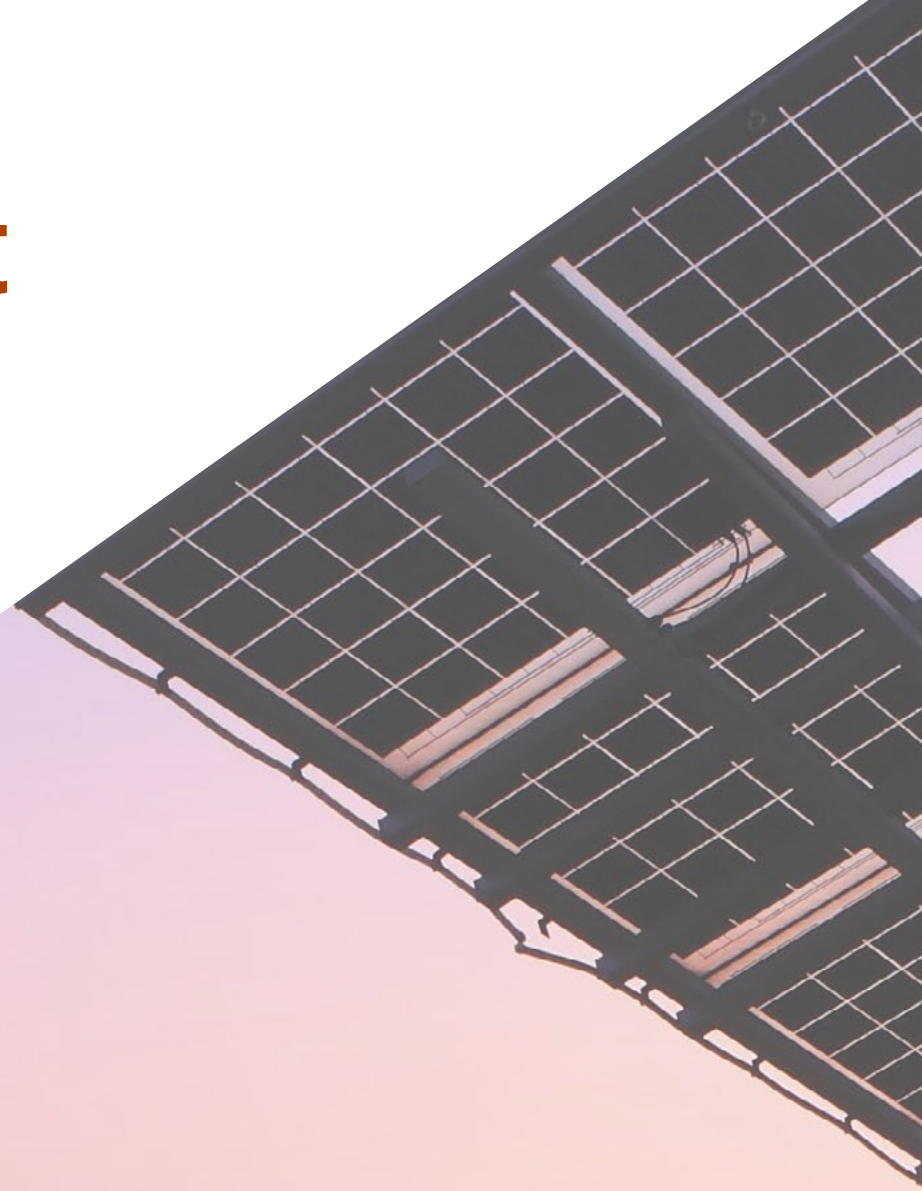
- ♦ Academic in Renewable Energies, Spain
- ♦ Green Infrastructure Project Development at Faktor Gruen, Germany
- ♦ Freelance Professional in Green Area Design in the Landscaping, Agriculture and Environment Sector, Valencia
- ♦ Agricultural Engineer at Floramedia Spain
- ♦ Agricultural Engineer by the 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 university program, engineers will master the physical and technological principles behind solar photovoltaic power generation. To this end, the syllabus will go in depth into aspects ranging from the characterization of demand profiles or site selection to the orientation of the solar field. Likewise, the syllabus will delve into the sizing of DC components, which will allow graduates to ensure that the components work within their optimum capacities. In addition, the teaching materials will highlight the importance of surplus management to maximize the use of locally generated energy.



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You will design self-consumption photovoltaic systems tailored to specific customer needs, considering aspects such as optimal panel placement and shade management”

Module 1. Self-Consumption Photovoltaic Installation Design

- 1.1. Off-Grid and Self-Consumption Systems
 - 1.1.1. Electricity Cost Structure. Fees
 - 1.1.2. Climate Data
 - 1.1.3. Restrictions: Urbanistic
- 1.2. Characterization of Demand Profiles
 - 1.2.1. Electrification of Demand
 - 1.2.2. Profile Modification Alternatives
 - 1.2.3. Estimation of the Design Demand Profile
- 1.3. Site Selection and Layout
 - 1.3.1. Restrictions: Exterior Surfaces, Slopes, Orientations, Accessibility
 - 1.3.2. Surplus Management. Virtual or Real Battery, Diversion to Equipment.
 - 1.3.3. Selection of the Installation Scheme
- 1.4. Solar Field Tilt and Orientation
 - 1.4.1. Optimal Tilt of the Solar Field
 - 1.4.2. Optimal Orientation of the Solar Field
 - 1.4.3. Management of Multiple Tilt/Orientation
- 1.5. Dimensioning of Components in DC
 - 1.5.1. Solar Field Sizing
 - 1.5.2. Solar Tracker Sizing
 - 1.5.3. Wiring and Protection Sizing
- 1.6. AC Component Sizing
 - 1.6.1. Inverter Sizing
 - 1.6.2. Other Elements: Monitoring, Control and Counters
 - 1.6.3. Wiring and Protection Sizing
- 1.7. Energy Yield Estimation
 - 1.7.1. Daily, Monthly and Annual Yield
 - 1.7.2. Production Parameters: Self-Consumption, Surplus
 - 1.7.3. Strategies for Sizing Optimization. Peak and Nominal Power Ratio





- 1.8. Coverage of Demand
 - 1.8.1. Demand Classification: Fixed and Variable
 - 1.8.2. Demand Management
 - 1.8.3. Demand Coverage Ratios. Optimization
- 1.9. Surplus Management
 - 1.9.1. Surplus Appraisal
 - 1.9.2. Derivation of Surplus to Real or Virtual Storage
 - 1.9.3. Derivation of Surplus to Regulated Loads
- 1.10. Design Examples of Self-Consumption Photovoltaic Installations
 - 1.10.1. Design of Individual Self-Consumption Photovoltaic Installation, with Surplus and without Batteries
 - 1.10.2. Design of Individual Self-Consumption Photovoltaic Installation, with Surplus and with Batteries
 - 1.10.3. Design of a Collective Self-Consumption Photovoltaic Installation, without Surplus



This program will allow you to balance your studies with your professional work while increasing your knowledge in the Design of Photovoltaic Self-Consumption Installations. 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.





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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.

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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.



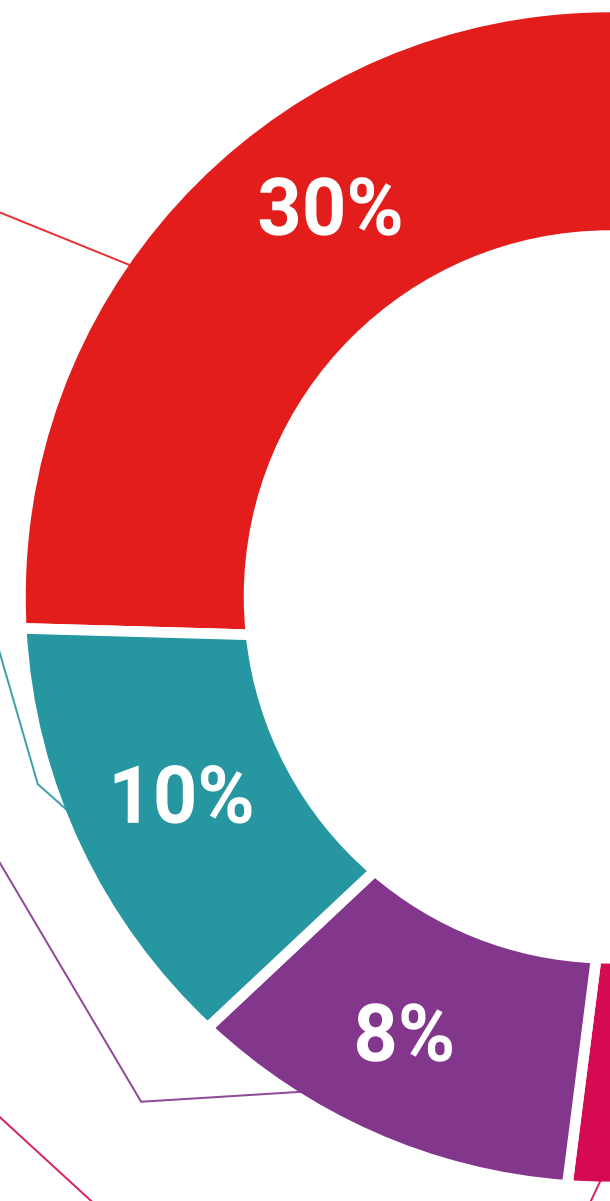
Practising Skills and Abilities

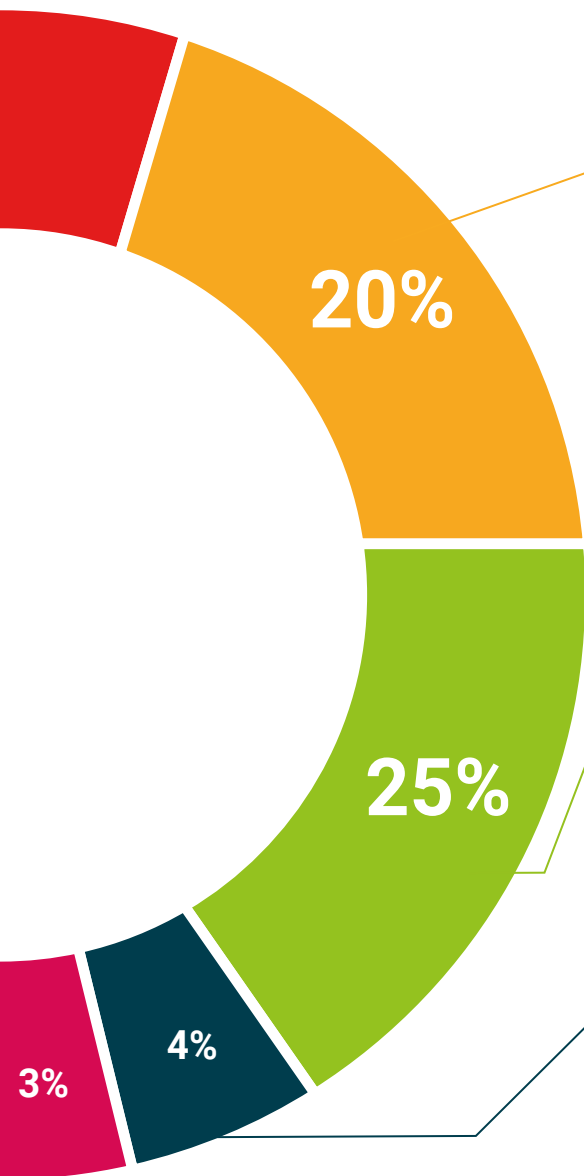
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



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 Self-Consumption 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.





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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 Self-Consumption 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 Self-Consumption Photovoltaic Installation Design**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**





Postgraduate Certificate
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Postgraduate Certificate Self-Consumption Photovoltaic Installation Design

