

# Postgraduate Certificate Photovoltaic Site Locations





## Postgraduate Certificate Photovoltaic Site Locations

- » 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/photovoltaic-site-locations](http://www.techtute.com/us/engineering/postgraduate-certificate/photovoltaic-site-locations)

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# 01

# Introduction

In a global context of transition towards renewable energy sources, solar photovoltaic energy is positioned as a key solution for clean electricity generation.

A study by the International Solar Industry Association estimates that PV system installation costs have decreased by 80% in the last decade.

However, maximizing the efficiency and return on investment of PV systems requires careful consideration of factors such as available solar radiation. Therefore, engineers need to incorporate into their practice the most sophisticated techniques for the evaluation and selection of PV site locations. In response to this, TECH presents a pioneering online university program that brings together the most innovative strategies in this field.







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*Through this 100% online Postgraduate Certificate, you will evaluate the Incident Solar Radiation in different locations using the most innovative tools to estimate the energy potential of a site location"*

Given the technological revolution brought about by Industry 4.0 and the decrease of costs in the photovoltaic industry, solar energy has become a viable option for large-scale electricity generation. Given this situation, the strategic location of PV plants plays a crucial role in their profitability and operational efficiency. In this scenario, engineers need to have a holistic view regarding site selection for PV systems, addressing aspects such as the evaluation of available solar radiation, the influence of climate or strategies to mitigate risks such as losses due to soiling.

For this reason, TECH launches a revolutionary Postgraduate Certificate on Photovoltaic Site Locations. The academic itinerary will focus on both the characterization and the analysis of the aspects related to the electrical production of Photovoltaic Installations. Along the same lines, the syllabus will explore the impact of climatic factors such as temperature, wind or humidity. In this way, graduates will be able to take appropriate measures to ensure the safety and durability of buildings. In addition, the program will investigate the selection criteria for photovoltaic plant site locations, which will enable engineering professionals to design systems that make the most of the natural conditions of the site.

On the other hand, thanks to TECH's revolutionary Relearning method, based on the continuous reiteration of key concepts, students will not have to invest many hours of study and memorization, since with this system they will be able to consolidate them much more easily. A program that acquires a greater attraction by facilitating access to its content, conveniently whenever and wherever the student wishes. And is that only need a digital device with an Internet connection (mobile, Tablet or computer), to access the syllabus hosted on the virtual platform.

This **Postgraduate Certificate in Photovoltaic Site Locations** 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



*A syllabus designed to boost your professional career as an engineer to the top"*



*With TECH's Relearning methodology you will study all the contents of this program from the comfort of your home and without the need to move to an educational center"*

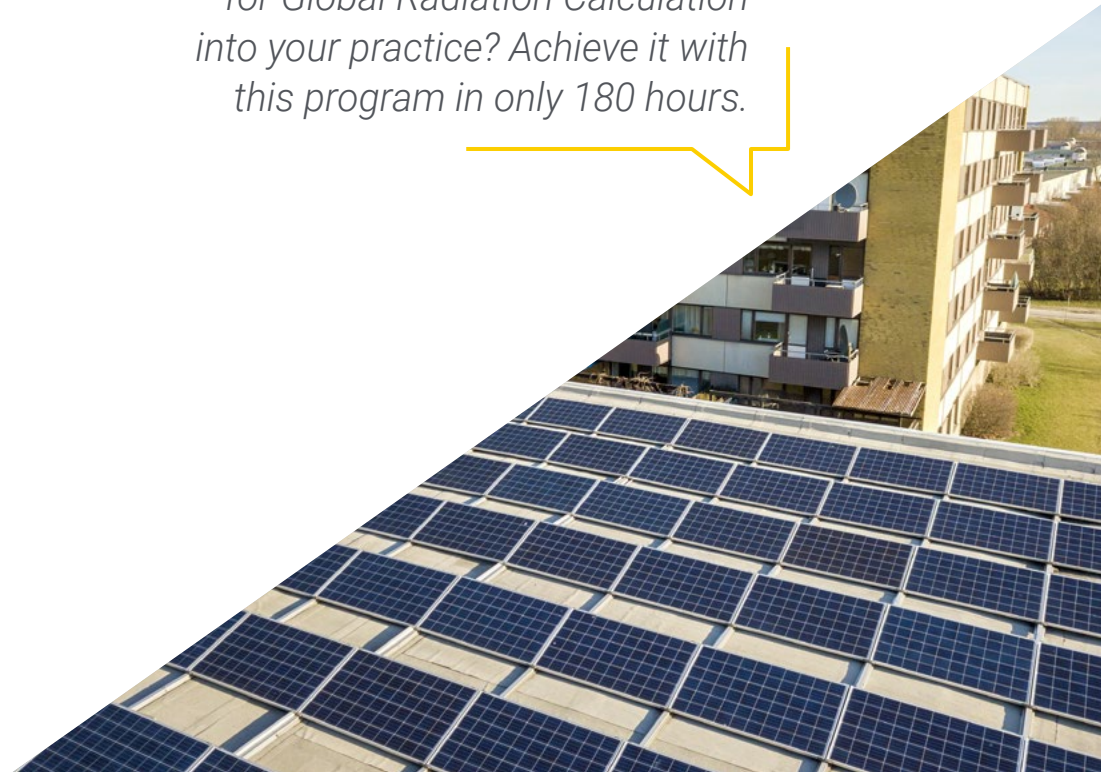
The program's teaching staff includes professionals from the field who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

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 Incidence of Solar Movement in the Shade to properly locate structures such as solar panels.*

*Do you want to incorporate the most advanced methodologies for Global Radiation Calculation into your practice? Achieve it with this program in only 180 hours.*





# 02

# Objectives

Through this Postgraduate Certificate, engineers will have a solid understanding of the principles that govern the operation of photovoltaic systems. Similarly, professionals will acquire skills to evaluate the solar radiation available at different locations. At the same time, graduates will apply the most sophisticated methodologies to calculate the Incident Solar Radiation on Inclined Surfaces, considering the latitude and the optimal inclination for photovoltaic systems. In addition, professionals will develop strategies to mitigate the adverse effects of environmental factors (such as humidity, condensation or altitude) on the performance of photovoltaic systems.







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*You will develop state-of-the-art methods to prevent losses due to dirt and shading in Photovoltaic Installations”*



## General Objectives

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- ♦ 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

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- ◆ Identify possible limitations or barriers to a photovoltaic installation due to its location
- ◆ Analyze the effect of other factors on electricity production such as shading, dirt, altitude, lightning, theft, etc.



*The university program will include interactive summaries of each topic so that you can dynamically consolidate the concepts of Photovoltaic Sites"*



03

# Course Management

TECH's priority is to provide the most pragmatic and up-to-date university programs on the educational market. In order to achieve this, the institution carries out an exhaustive process to constitute its teaching staff. Thanks to this, the present Postgraduate Certificate will be taught by authentic references in the field of Photovoltaic Site Locations. These professionals have an extensive professional background, where they have been part of internationally recognized institutions.

In this way, they have created numerous teaching materials that bring together the most innovative strategies in this field, to ensure that graduates experience a leap in quality in their careers as engineers.

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*You will enjoy the personalized advice of the teaching team, made up of professionals with extensive experience in Photovoltaic Site Locations”*

## 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, Complutense University of Madrid
- ♦ Degree in Physics from the Complutense University of Madrid

## Professors

### Dr. Garcia Nieto, David

- ♦ Academic in Atmospheric Sciences
- ♦ PhD in Atmospheric Sciences from the Spanish National Research Council (CSIC) and the Polytechnic University of Madrid
- ♦ 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







# 04

# Structure and Content

Through this university program, engineers will have a solid understanding of solar radiation, the voltaic conversion of sunlight into electricity and the operation of photovoltaic systems. The syllabus will focus on the characterization of all the factors associated with the electrical production of Photovoltaic Installations. In line with this, the syllabus will delve into the Calculation of Radiation on Tilted Surfaces, which will allow graduates to correctly dimension photovoltaic systems in order to maximize their energy yield.



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*You will apply state-of-the-art methodologies to calculate Incident Solar Radiation on tilted surfaces"*



## Module 1. Location of Photovoltaic Installations

- 1.1. Solar Radiation
  - 1.1.1. Quantities and Units
  - 1.1.2. Interaction with the Atmosphere
  - 1.1.3. Radiation Components
- 1.2. Solar Trajectories
  - 1.2.1. Sun's Movement. Solar Time
  - 1.2.2. Parameters that Determine the Sun's Position
  - 1.2.3. Incidence of Sun's Movement on the Shade
- 1.3. Terrestrial and Satellite Databases
  - 1.3.1. Terrestrial Databases
  - 1.3.2. Satellite Databases
  - 1.3.3. Advantages and Disadvantages
- 1.4. Radiation Calculation on Tilted Surfaces
  - 1.4.1. Methodology
  - 1.4.2. Global Radiation Calculation Exercise I. Effect of Latitude and Tilt on Photovoltaic Systems
  - 1.4.3. Global Radiation Calculation Exercise II. Self-Calibration Systems
- 1.5. Other Environmental Factors
  - 1.5.1. Influence of Temperature
  - 1.5.2. Influence of Wind
  - 1.5.3. Influence of Other Factors: Humidity, Condensation, Dust, Altitude.
- 1.6. Influence of Soiling on the Photovoltaic Solar Field
  - 1.6.1. Types of Soiling
  - 1.6.2. Losses due to Soiling
  - 1.6.3. Strategies and Methods to Avoid Losses due to Soiling
- 1.7. Influence of Shading on the Photovoltaic Solar Field
  - 1.7.1. Shading Types
  - 1.7.2. Losses due to Shading
  - 1.7.3. Strategies and Methods to Avoid Losses Due to Shade





- 1.8. Influence of Other Factors: Theft, Lightning
  - 1.8.1. Lightning Risk: Overvoltages
  - 1.8.2. Total or Partial Risk of Theft: Module, Wiring
  - 1.8.3. Prevention Measures
- 1.9. Site Location Selection Criteria for Photovoltaic Plants
  - 1.9.1. Technical Criteria
  - 1.9.2. Environmental Criteria
  - 1.9.3. Other Criteria: Administrative and Financial
- 1.10. Site Location Selection Criteria for Self-Consumption and Off-Grid Systems
  - 1.10.1. Technical and Architectural Integration Criteria
  - 1.10.2. Photovoltaic Generator Tilt(s) and Orientation(s)
  - 1.10.3. Other Criteria: Accessibility, Safety, Shading, Soiling

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*You will have at your disposal the most modern educational resources, with free access to the Virtual Campus 24 hours a day. 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.

“

*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.*



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

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.*

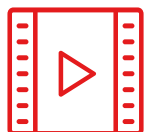
From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain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



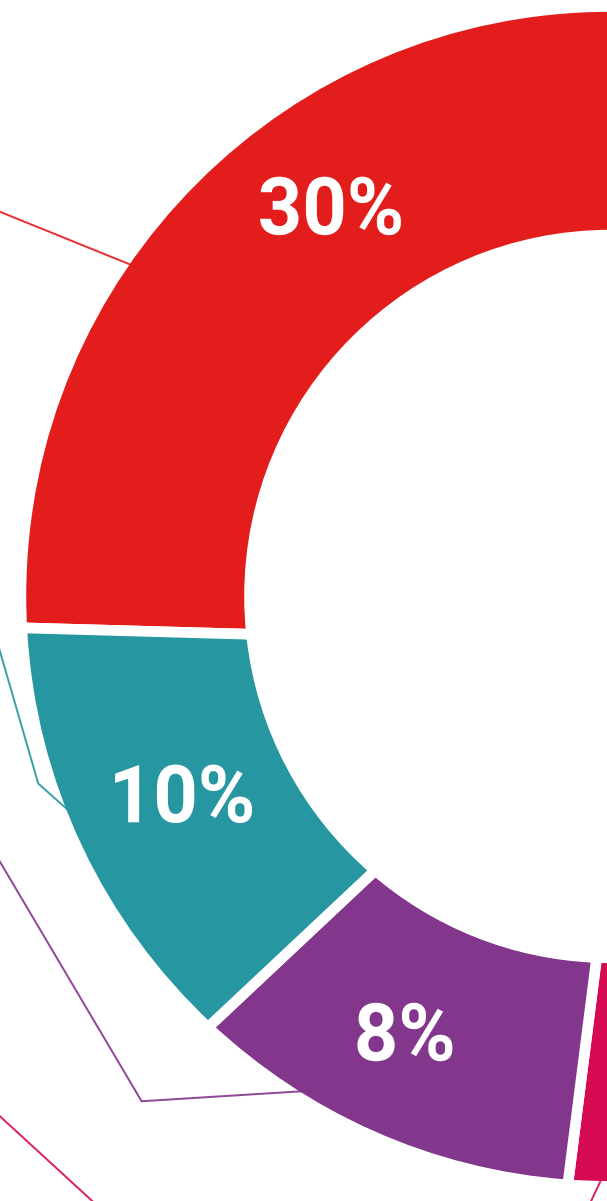
### Practising Skills and Abilities

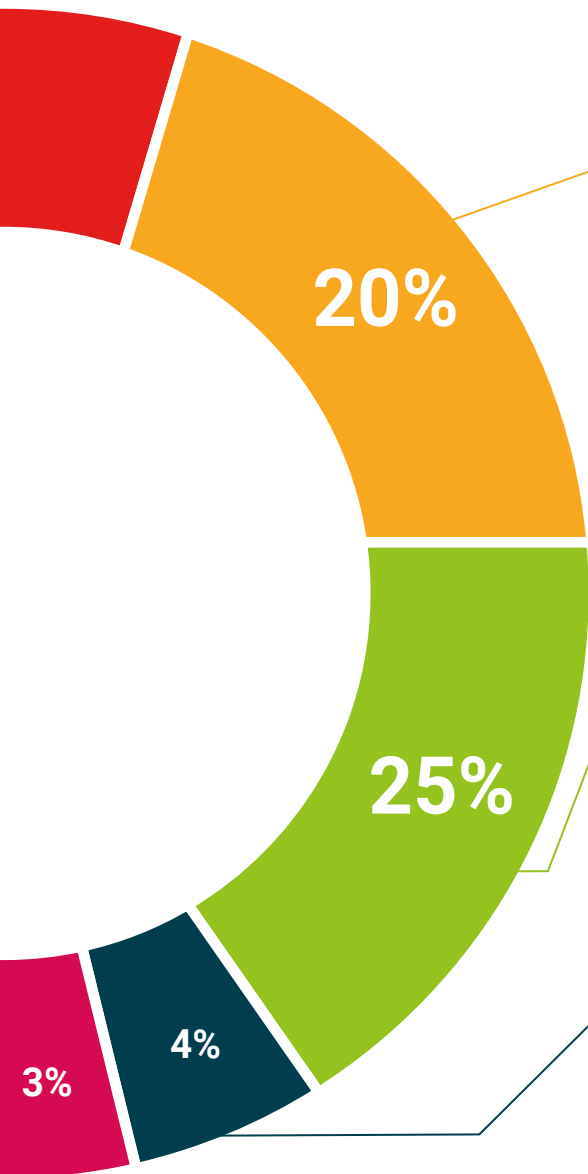
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### 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 Photovoltaic Site Locations guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



The image features two black graduation caps (mortarboards) against a blue sky with light clouds. The caps are positioned diagonally, with one in the foreground and another slightly behind it. The background is split into a blue sky on the left and a dark brown gradient on the right. A white diagonal shape separates the two background colors, creating a space for text.

“

*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 Photovoltaic Site Locations** 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 Photovoltaic Site Locations**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present quality  
development lang  
classroom



## Postgraduate Certificate Photovoltaic Site Locations

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

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