

Postgraduate Certificate Alternating Current Photovoltaic Installations



Postgraduate Certificate

Alternating Current Photovoltaic Installations

- » 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/alternating-current-photovoltaic-installations

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01

Introduction

The increase in the demand for electrical energy, together with the need to reduce greenhouse gas emissions, has catapulted Alternating Current Photovoltaic Installations as a highly sustainable solution. These systems not only harness solar energy efficiently, but also contribute significantly to the diversification of energy sources and the mitigation of climate change. Given this reality, it is vital that engineering professionals keep abreast of the latest technical advances in this area to offer excellent quality services. For this reason, TECH presents a revolutionary program that brings together the most sophisticated techniques for Alternating Current Photovoltaic Installations, all in a convenient online program! All in a convenient online modality!





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Thanks to this 100% online Postgraduate Certificate, you will efficiently manage photovoltaic projects and ensure their successful implementation"

The energy revolution driven by alternating current solar PV is marking a significant milestone in the transition to a more sustainable and diversified energy system. A report by the International Energy Agency forecasts that global PV generation capacity will reach 1,300 gigawatts over the next year, reaching a projected annual growth of 20%. In this sense, engineers need to incorporate into their practice the most sophisticated strategies for the design, operation and management of photovoltaic systems. In this way, they will be able to maximize the efficiency of these systems and contribute to energy sustainability.

Within this framework, TECH created a complete and innovative Postgraduate Certificate in Alternating Current Photovoltaic Installations. The academic itinerary will focus on the analysis of the components that make up these systems, both in low voltage and high voltage. In this sense, the syllabus will delve into the specificities of elements ranging from transformers or inverters to wiring procedures. At the same time, the program will offer students the most advanced techniques for electrical protection. In this way, engineers will be able to diagnose and locate electrical faults, which will allow for more efficient maintenance of PV systems.

On the other hand, the university qualification is based on the Relearning method, of which TECH is a pioneer. This system uses the reiteration of key content in a natural way, ensuring that the content is retained in the students' memory without the need for memorization. It should be noted that the only thing required to access the Virtual Campus is an electronic device with an Internet connection (phones, tablets or computers). In addition, students will be able to access a digital library full of additional teaching materials to enrich their educational experience.

This **Postgraduate Certificate in Alternating Current Photovoltaic Installations** contains the most complete and up-to-date 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



You will have the support of TECH, the world's largest online educational institution, with the latest educational technology at your disposal"

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Do you want to acquire advanced skills in the physical installation of photovoltaic systems? Achieve it with this complete 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 address Battery Parameters to design solutions that maximize the performance of these components.

With the Relearning system used by TECH you will reduce the long hours of study and memorization. You will enjoy a progressive learning process.



02

Objectives

Upon completion of this Postgraduate Certificate, engineers will have a comprehensive understanding of the operation of photovoltaic systems, including the conversion of solar radiation into electricity. Likewise, professionals will acquire advanced skills to design grid-connected photovoltaic systems, considering aspects ranging from the geographical location or tilting of the solar panels to the sizing of the system. In turn, graduates will carry out shading analysis and energy production estimates.





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You will handle the most cutting-edge strategies for preventive and corrective maintenance of photovoltaic systems, including performance monitoring”



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 softwares: 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

- ♦ 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.



*You will learn through real cases
and by solving complex situations in
simulated learning environments”*

03

Course Management

TECH's main objective is to offer the most comprehensive and up-to-date university programs on the educational market. To achieve this, it carries out a meticulous process to set up its teaching staff. Thanks to this, the present Postgraduate Certificate has the collaboration of the best experts in the field of Alternating Current Photovoltaic Installations. These specialists have an extensive professional background, where they have developed their work in prestigious international entities. In this way, they have created several teaching materials defined by their quality and full applicability to the requirements of the labor market.





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The teaching team, made up of experts in Photovoltaic Solar Energy, has designed hours of additional content for you to expand each section of the syllabus in a personalized way"

Management



Dr. Blasco Chicano, Rodrigo

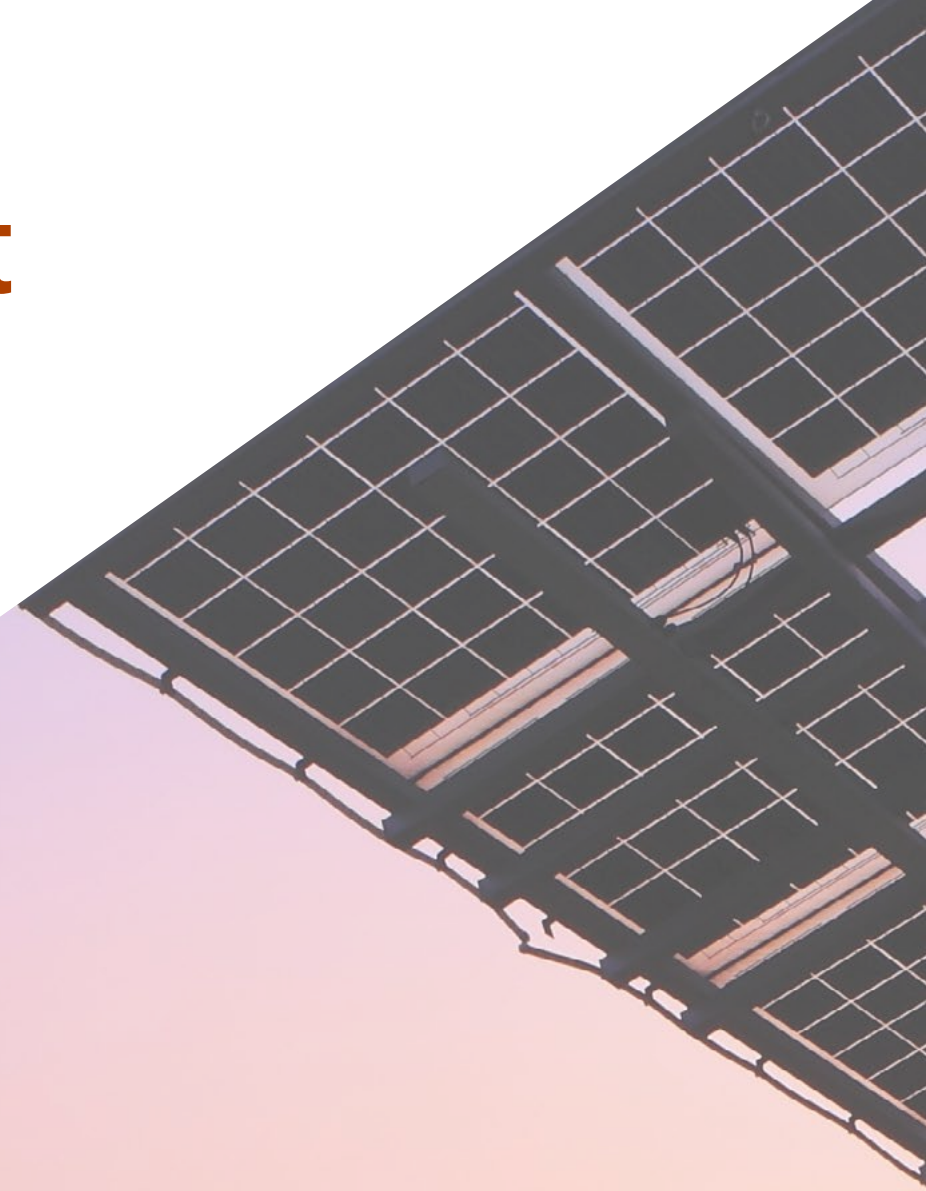
- ♦ Academic in Renewable Energy, Madrid
- ♦ Energy Consultant at JCM Bluenergy, Madrid
- ♦ PhD in Electronics from the University of Alcalá
- ♦ Specialist in Renewable Energy from the Complutense University of Madrid
- ♦ Master's Degree in Energy from the Complutense University of Madrid
- ♦ Degree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



04

Structure and Content

Through this university program, engineers will acquire a solid knowledge of the operation of alternating current photovoltaic systems. The syllabus will focus on the analysis of their components, including inverters, transformers or batteries. In this sense, the syllabus will provide students with the most innovative measures for Alternating Current electrical protections. In this way, professionals will ensure the safety of both people and equipment. Throughout the program, graduates will obtain skills to design photovoltaic systems connected to the electrical grid.





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You will develop practical skills in the physical installation of photovoltaic systems, including the configuration of solar panels, assembly of structures and electrical connection”

Module 1. Alternating Current Photovoltaic Installations

- 1.1. Inverter Technology
 - 1.1.1. The Inverter Technology
 - 1.1.2. Evolution by Technology
 - 1.1.3. Comparative Analysis of the main Commercial Technologies
- 1.2. Technical Parameters of the Inverters
 - 1.2.1. Electrical Technical Parameters
 - 1.2.2. Other Technical Parameters
 - 1.2.3. International Normative Framework
- 1.3. Inverters Selection Criteria
 - 1.3.1. Technical Criteria
 - 1.3.2. Economic Criteria
 - 1.3.3. Other Criteria
- 1.4. Transformer Technology
 - 1.4.1. Classification of Transformer Technologies
 - 1.4.2. Evolution by Technology
 - 1.4.3. Comparative Analysis of the main Commercial Technologies
- 1.5. Technical Parameters of Transformers
 - 1.5.1. Electrical Technical Parameters
 - 1.5.2. High-Voltage Switchgear: Switches, Disconnectors and Self-Operated Valves
 - 1.5.3. International Normative Framework
- 1.6. Transformers Selection Criteria
 - 1.6.1. Technical Criteria
 - 1.6.2. Economic Criteria
 - 1.6.3. Other Criteria
- 1.7. Alternating Current (AC) Electrical Protections
 - 1.7.1. Protection Against Indirect Contacts
 - 1.7.2. Protection Against Overvoltage
 - 1.7.3. Other Protections: Grounding, Overload and Short-Circuit Systems





- 1.8. Alternating Current and Low Voltage Wiring
 - 1.8.1. Type of Wiring
 - 1.8.2. Wiring Selection Criteria
 - 1.8.3. Wire Sizing. Conduits, Manholes
- 1.9. High-Voltage Wiring
 - 1.9.1. Type of Wiring, Poles
 - 1.9.2. Wiring Selection Criteria, Layouts, Poles, Declaration of Public Utility
 - 1.9.3. Wire Sizing
- 1.10. Civil Works
 - 1.10.1. Civil Works
 - 1.10.2. Accesses, Rainwater Outlets Drainage, Enclosures, etc.
 - 1.10.3. Electrical Evacuation Networks. Transport Capacity

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This qualification will allow you to expand your knowledge in a totally personalized way, according to your needs and obligations. 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.

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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 Alternating Current Photovoltaic Installations 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 Alternating Current Photovoltaic Installations** 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 Alternating Current Photovoltaic Installations**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**





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