

Postgraduate Certificate

Electrical and Communications Engineering for Wind Farms





Postgraduate Certificate Electrical and Communications Engineering for Wind Farms

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

Website: www.techtitude.com/us/engineering/postgraduate-certificate/electrical-communications-engineering-wind-farms

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01

Introduction to the Program

Electrical and Communication Engineering in Wind Farms is crucial for the development of Renewable Energy, especially in a global context that aims to diversify energy sources and reduce reliance on fossil fuels. This field not only focuses on generating electricity from wind, but also addresses the challenges of grid integration, optimizing equipment maintenance, and managing communications. In this context, TECH Global University has launched a comprehensive, fully online program that requires only an electronic device with an internet connection to access all educational materials. Furthermore, it is based on the innovative Relearning methodology, which is pioneering at this institution.



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With this 100% online program, you will acquire advanced technical skills highly valued in the growing Renewable Energy sector, with an increasing demand for qualified professionals”

Electrical and Communication Engineering in Wind Farms is experiencing significant growth and is becoming increasingly crucial in the transition to renewable energy. Additionally, the implementation of innovative technologies, such as predictive models to optimize energy production, can increase the efficiency of existing wind farms without the need for new hardware installation.

To emphasize these new trends, TECH offers this program, which will thoroughly analyze the architecture and functioning of these systems, providing professionals with the necessary tools to understand how electrical components interact in Wind Energy generation. This approach will not only facilitate learning about wind turbines but also prepare engineers to tackle the technical challenges that arise in the field.

Furthermore, the program will explore the identification of electrical components within the wind turbine and the data acquisition systems that enable the monitoring and control of its operations. Additionally, electric substations will be examined, focusing on essential components and the protection equipment that ensures safety and efficiency.

On the other hand, the importance of supervisory control systems and data acquisition will be addressed, which are vital for managing the energy generated. In this regard, engineers will be able to define the elements that make up these systems and their function within the context of a wind farm. Moreover, strategies for data collection and analysis will be examined, enabling the optimization of wind turbine operations and contributing to greater efficiency in clean energy generation.

In this way, TECH has created a comprehensive, fully online, and flexible program, allowing graduates to avoid the inconveniences of commuting to a physical location and the need to adapt to fixed schedules. Additionally, students will benefit from the support of the revolutionary Relearning methodology, based on the repetition of key concepts to achieve optimal and natural content comprehension.

This **Postgraduate Certificate in Electrical and Communications Engineering for Wind Farms** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ The development of practical cases presented by experts in engineering focused on Wind Energy
- ♦ The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable 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



Choose TECH! The job market for engineers in Renewable Energy is expanding, driven by global policies that promote the transition to more sustainable energy sources"

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You will identify the electrical components that integrate wind turbines, as well as the communication systems that enable the effective transmission of information, supported by an extensive library of multimedia resources”

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 learn in 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, students will be assisted by an innovative interactive video system created by renowned experts.

You will analyze the components that make up the communication between wind turbines, understanding the necessary interactions for the efficient and safe operation of wind farms. What are you waiting for to enroll?

You will dive into supervisory control systems and data acquisition, fundamental components for real-time monitoring and control of electricity production. With all TECH's quality guarantees!



02

Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it relies on an enormous faculty of more than 6,000 professors of the highest international renown.



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*Study at the world's largest online university
and guarantee your professional success.
The future starts at TECH”*

The world's best online university, according to FORBES

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

Forbes

The best online university in the world

The most complete
syllabus

The most complete syllabuses on the university scene

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

The best top international faculty

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistumba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

TOP
international faculty

The most effective methodology

A unique learning method

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

The world's largest online university

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

World's No.1
The World's largest online university

The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

Leaders in employability

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.



Google Premier Partner

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.



The top-rated university by its students

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.



03 Syllabus

The syllabus will address the principles governing the operation of wind turbines, including the identification of their electrical components and the control systems necessary for their efficient operation. Additionally, it will delve into communication technologies that enable interaction between the various elements of a wind farm, as well as the functioning of data acquisition systems that optimize energy production. The program will also explore a detailed analysis of electric substations, their components, and the protection equipment required to ensure the safety and stability of the installations.



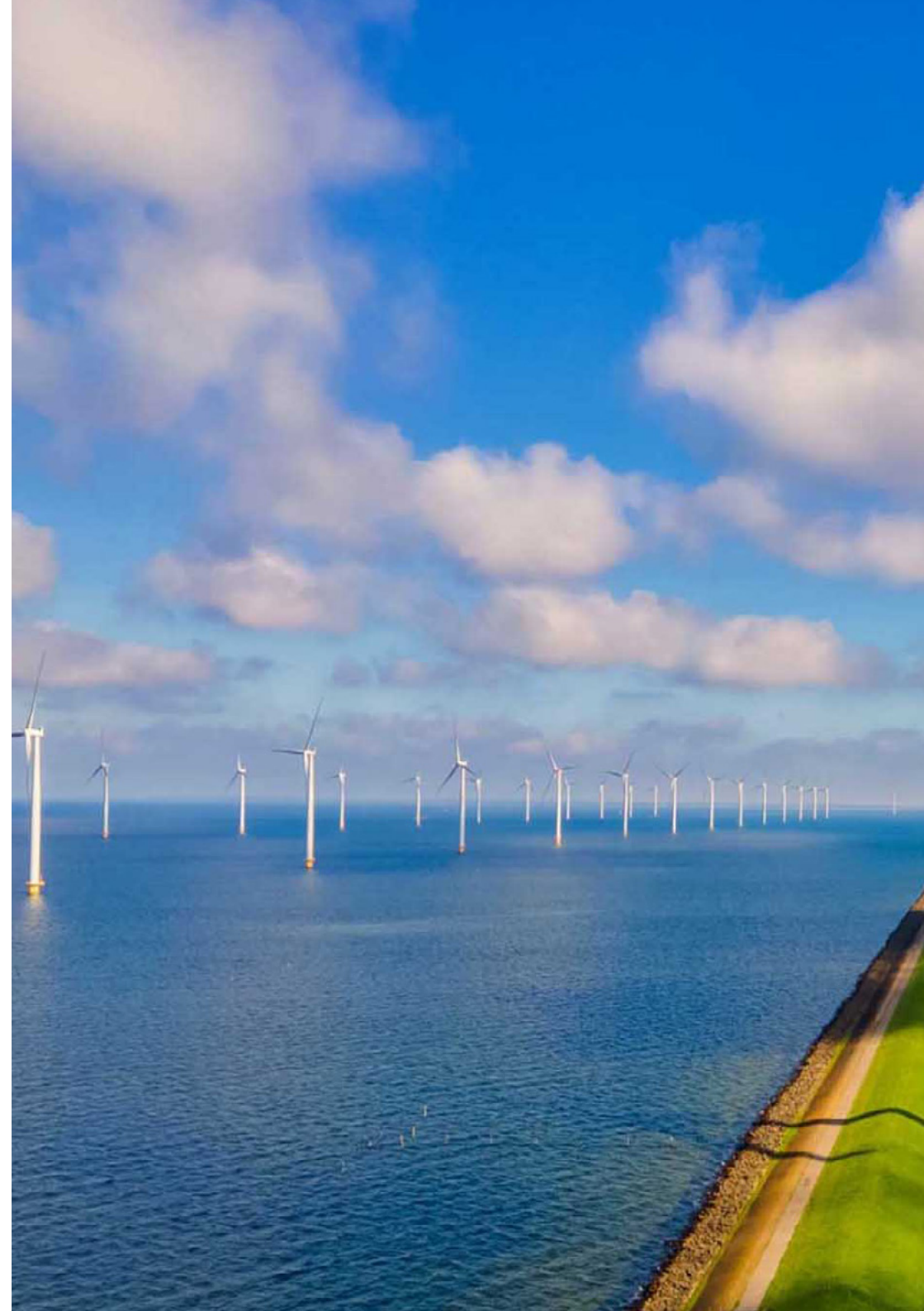


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The content of this program has been designed to provide you with a comprehensive understanding of electrical and communication systems in Wind Energy”

Module 1. Electrical and Communications Design for Wind Farms

- 1.1. Electrical Circuits in the Wind Farm: Low Voltage, Transformer, Distribution, Substation
 - 1.1.1. Electrical Distribution Networks
 - 1.1.2. Distribution Substations
 - 1.1.3. Low Voltage Network Components
- 1.2. Alignment of Wind Turbines and Single-Line Diagrams
 - 1.2.1. The Wind Farm
 - 1.2.2. Electrical Symbols
 - 1.2.3. Single-Line Diagram of a Wind Turbine
 - 1.2.4. Single-Line Diagram of Medium Voltage Collector System
 - 1.2.5. Single-Line Diagram of Generation Substation
- 1.3. Medium Voltage Transformers
 - 1.3.1. Medium Voltage Transformer
 - 1.3.2. Electrical Connections
 - 1.3.3. Protection Systems
- 1.4. Substation (I). High Voltage Transformer
 - 1.4.1. High Voltage Transformer
 - 1.4.2. Electrical Connections
 - 1.4.3. Protection Systems
- 1.5. Substation (II). High Voltage Side and Connection to the Electric Company
 - 1.5.1. Outdoor Park
 - 1.5.2. Switchgear
 - 1.5.3. Disconnectors
- 1.6. Substation (III). Medium Voltage Cells and Protection
 - 1.6.1. Medium Voltage Cell
 - 1.6.2. Current and Voltage Transformers
 - 1.6.3. Electrical Connections





- 1.7. Fiber Optic Network for Communication and Monitoring System
 - 1.7.1. Fiber Optic Systems. Advantages and Disadvantages
 - 1.7.2. Fiber Optic Configurations
 - 1.7.3. Fiber Optic Network in Wind Farms
- 1.8. Capacitor Banks in the Substation
 - 1.8.1. Capacitor Bus
 - 1.8.2. Current Collectors
 - 1.8.3. Crowbar
- 1.9. SCADA. Wind Farm Measurement Parameters
 - 1.9.1. SCADA System Configuration
 - 1.9.2. Monitoring Parameters
 - 1.9.3. Technology and Hardware
- 1.10. SCADA. Communication and Operation with the Electric Company
 - 1.10.1. International Standards and Grid Codes
 - 1.10.2. Client SCADA Operation
 - 1.10.3. Local-Remote Operation

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Upon completion, you will be prepared to take on key roles in the planning, design, and operation of wind farms, positioning yourself as an important player in the fight against climate change”

04

Teaching Objectives

One of the main objectives of the program will be to develop a deep understanding of the electrical and communication systems that operate in wind turbines and wind farms, enabling you to design, implement, and optimize these technologies. Additionally, critical analysis of the components of electrical substations and control systems will be encouraged, along with the identification of electrical elements integrated into wind turbines. You will also acquire technical knowledge, developing practical skills in data management and communication in the context of Wind Energy, contributing to sustainability and efficiency in energy production”





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The objectives of the Electrical and Communication Engineering for Wind Farms program will focus on preparing you to face the challenges of the Wind Energy sector”



General Objectives

- ♦ Develop a specialized understanding of the electrical and communication systems of a wind turbine
- ♦ Analyze the systems that integrate communication in wind turbines
- ♦ Generate specialized knowledge about the components of electrical substations and supervisory control and data acquisition systems
- ♦ Delve into the components and protection equipment of electrical substations





Specific Objectives

- ♦ Identify the electrical components that make up a wind turbine
- ♦ Analyze the communication systems that make up a Wind Farm
- ♦ Describe the function of the data acquisition systems in a wind turbine
- ♦ Define the elements that make up the data acquisition system of a wind farm

“

You will contribute to the creation of wind infrastructure, participating in the development of innovative technologies that optimize energy efficiency and minimize environmental impact, supported by the Relearning methodology”



05

Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.



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TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

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*At TECH you will NOT have live classes
(which you might not be able to attend)”*



The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

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TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want”

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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



A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”

The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.

The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.



As such, the best educational materials, thoroughly prepared, will be available in this program:



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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



Interactive Summaries

We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

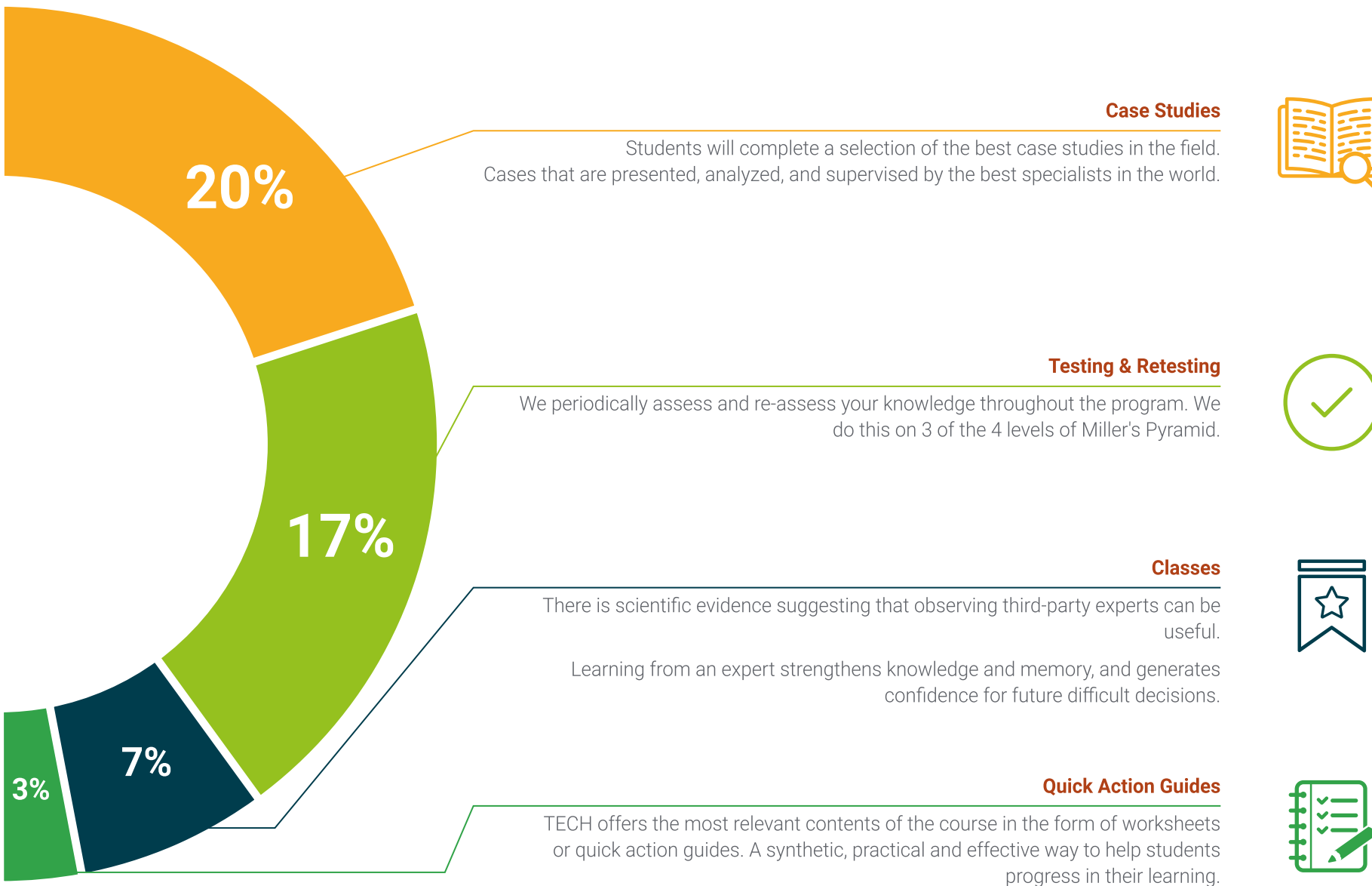
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





06

Teaching Staff

The teachers are highly trained professionals with both academic and practical experience in the Renewable Energy sector. In fact, they come from renowned institutions and hold advanced degrees in Electrical Engineering, communications, and related fields, ensuring high-quality training. Moreover, they have experience in real-world wind farm projects, providing a practical and up-to-date perspective on market technologies and trends. As such, they will not only impart theoretical knowledge but will also foster an interactive learning environment, encouraging graduates to engage in innovative research and projects.



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The instructors will help prepare competent professionals ready to face future challenges in the Wind Energy industry, using the best educational materials available in the academic market”

Management



Mr. Melero Camarero, Jorge

- ♦ Deputy Director of Construction at Eney, Vienna
- ♦ Country Manager for Spain at Ezzing Solar
- ♦ General Manager of Environmental and Social Consulting at Natura Medioambiente
- ♦ Deputy Director of the Renewable Energy Division at Alatec Ingenieros Consultores y Arquitectos
- ♦ Director of the Renewable Energy Department at Gestionna Soluciones Energéticas
- ♦ Renewable Energy Project Director at ABO Wind Spain
- ♦ Master's Degree in Business Administration (MBA)
- ♦ Master's Degree in Renewable Energy Consulting
- ♦ Bachelor's Degree in Industrial Engineering from the Polytechnic University of Valencia

Teachers

Mr. Flores Sandoval, Edwin Marcelo

- ♦ Electromechanical Engineer
- ♦ Project Engineer at Multipronin Ingeniería y Proyectos
- ♦ Senior Technologist in Administration from the Rumiñahui Higher Technological Institute
- ♦ Master's Degree in Renewable Energy from the International University of Ecuador
- ♦ Master's Degree in Business Administration with a specialization in Strategic Project Management from the University of the Americas
- ♦ Master's Degree in Digital Law with a specialization in Legal Innovation and the Digital Environment from the University of the Hemispheres



07

Certificate

The Postgraduate Certificate in Electrical and Communications Engineering for Wind Farms guarantees students, in addition to the most rigorous and up-to-date education, access to a diploma for the 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 diploma for the **Postgraduate Certificate in Electrical and Communications Engineering for Wind Farms** 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 Electrical and Communications Engineering for Wind Farms**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**





Postgraduate Certificate Electrical and Communications Engineering for Wind Farms

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