

# Postgraduate Certificate

## Operation and Maintenance of Wind Farms



## Postgraduate Certificate Operation and Maintenance of Wind Farms

- » 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/operation-maintenance-wind-farms](http://www.techtute.com/us/engineering/postgraduate-certificate/operation-maintenance-wind-farms)

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# 01

# Introduction to the Program

Operation and Maintenance (O&M) of Wind Farms is essential to ensure their efficiency and lifespan. In fact, Wind Energy has become one of the fastest-growing renewable sources, contributing to nearly 7% of global electricity generation. O&M tasks involve continuous monitoring and turbine repair, as well as the implementation of advanced technologies such as predictive analytics and the use of robots for inspections. In this context, TECH Global University has developed a comprehensive, fully online program that can be accessed simply with an electronic device and an internet connection to access all educational materials. Additionally, it is supported by the innovative Relearning learning methodology, a pioneering approach within the institution.



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*With this 100% online program, you will acquire specialized knowledge in preventive, corrective, and scheduled maintenance strategies to optimize the performance of wind turbines”*

In the current context of the energy transition, Operation and Maintenance of Wind Farms has become essential to ensure the efficiency and sustainability of this renewable energy source. According to a report by the International Renewable Energy Agency (IRENA), global installed wind energy capacity is expected to reach 2.1 terawatts.

This program is designed to help engineers determine and implement specific maintenance strategies that ensure the optimal operation of wind turbines, minimizing downtime and supply interruptions. Additionally, advanced fault diagnosis and troubleshooting techniques will be explored to quickly identify the cause of breakdowns and apply effective solutions.

The program will also cover the implementation of scheduled maintenance protocols and periodic inspections using state-of-the-art tools such as drones and ultrasonic devices, allowing for thorough and efficient reviews of each wind turbine component. Furthermore, current health, safety, and environmental regulations specific to Operations and Maintenance (O&M) in the Wind Energy sector will be analyzed to ensure compliance with international standards and minimize risks associated with working at height and under adverse conditions.

Finally, particular challenges and maintenance strategies for offshore wind turbines will be addressed, requiring a specialized approach due to the extreme conditions of the marine environment. In this regard, professionals will be able to develop optimization strategies that help reduce maintenance costs and maximize the profitability of wind farms.

As such, TECH has created a comprehensive, fully online, and adaptable program, allowing graduates to avoid inconveniences such as commuting to a physical location or adhering to a fixed schedule. Additionally, it will incorporate the revolutionary Relearning methodology, which is based on the repetition of key concepts to ensure optimal and natural assimilation of the content.

This **Postgraduate Certificate in Operation and Maintenance of 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



*You will be able to diagnose and resolve faults, as well as address the essential safety, health, and environmental regulations in Wind Energy operations. With all the quality assurances that TECH provides!"*

“

*You will determine the best maintenance practices, implementing scheduled maintenance protocols and inspections using advanced tools, thanks to an extensive library of multimedia resources”*

The program's teaching staff includes professionals from the sector who contribute their work experience to this specializing 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 examine emerging technological innovations, such as Artificial Intelligence and predictive maintenance, which are revolutionizing the sector and offering new opportunities to enhance efficiency.*

*You will delve into the use of advanced monitoring and control systems, such as the Supervisory Control and Data Acquisition (SCADA) system, which enables continuous improvement in operational performance.*



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 has a huge faculty of more than 6,000 professors of the highest international prestige.



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*Study at the largest online university in the world and ensure your professional success. The future begins 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 topics covered will include preventive and corrective maintenance strategies for wind turbines, as well as the implementation of scheduled maintenance protocols and inspections, using advanced tools to maximize operational efficiency. The program will also delve into fault diagnosis techniques and troubleshooting, familiarizing you with monitoring and control systems like SCADA to improve the performance of wind farms. Additionally, health, safety, and environmental regulations will be addressed, analyzing the specific challenges and strategies for the operation and maintenance of offshore wind turbines.



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*This program in Operation and Maintenance of Wind Farms will provide comprehensive content, designed to equip you with the essential skills in the renewable energy sector. Enroll now!”*

## Module 1. Operation and Maintenance of Wind Farms

- 1.1. Operation and Maintenance (O&M) of Wind Farms
  - 1.1.1. Importance of O&M (Operation and Maintenance) in Wind Energy
  - 1.1.2. Wind Turbines Life Cycle
  - 1.1.3. Key Players in O&M (Operation and Maintenance) of Wind Energy
- 1.2. Maintenance and Reliability Strategies in Wind Farms
  - 1.2.1. Preventive Maintenance Strategies
  - 1.2.2. Corrective Maintenance Strategies
  - 1.2.3. Reliability and Failure Analysis in Wind Turbines
  - 1.2.4. Optimization of Maintenance Plans
- 1.3. Scheduled Maintenance Protocols and Wind Farm Inspections
  - 1.3.1. Establishing Maintenance Schedules
  - 1.3.2. Routine Inspection Techniques
    - 1.3.2.1. Visual Inspections
    - 1.3.2.2. Drone Inspections
  - 1.3.3. Use of Predictive Maintenance Tools
    - 1.3.3.1. Vibration Analysis
    - 1.3.3.2. Thermography
- 1.4. Fault Diagnosis and Troubleshooting in Wind Turbines
  - 1.4.1. Common Wind Turbine Failures
  - 1.4.2. Diagnostic Techniques
  - 1.4.3. Troubleshooting Procedures
  - 1.4.4. Case Studies of Fault Resolution
- 1.5. Advanced Monitoring and Control Systems for Wind Farms
  - 1.5.1. SCADA Systems in Wind Energy
  - 1.5.2. Real-Time Monitoring Technologies
  - 1.5.3. Data Analysis for Predictive Maintenance
  - 1.5.4. Remote Operations and Maintenance



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- 1.6. Operation and Maintenance (O&M) of Offshore Wind Turbines
    - 1.6.1. Specific Challenges of Offshore O&M
    - 1.6.2. Maintenance Strategies for Offshore Wind Farms
    - 1.6.3. Access and Logistics
    - 1.6.4. Use of Autonomous and Remote-Controlled Systems
  - 1.7. Health, Safety, and Environmental Considerations in Wind Farm Operation and Maintenance
    - 1.7.1. International Health and Safety Regulations in Wind Energy O&M
    - 1.7.2. Risk Assessment and Management
    - 1.7.3. Environmental Impact and Mitigation Strategies
    - 1.7.4. Emergency Response Planning
  - 1.8. Cost Management and Economic Considerations
    - 1.8.1. Cost Structure of Wind Energy O&M
    - 1.8.2. Strategies to Reduce Maintenance Costs
    - 1.8.3. Economic Impact of Maintenance Strategies
    - 1.8.4. Financial Models for O&M Planning
  - 1.9. Technological Innovations in Wind Energy O&M
    - 1.9.1. Emerging Technologies in Wind Turbine Maintenance
    - 1.9.2. Role of Artificial Intelligence and Machine Learning
    - 1.9.3. Future Trends in Wind Energy O&M
    - 1.9.4. Integration of Renewable Energy Systems
  - 1.10. Successful O&M Programs and Industry Best Practices
    - 1.10.1. Successful O&M Programs
    - 1.10.2. Lessons Learned from Industry Leaders
    - 1.10.3. Best Practices for Wind Energy O&M
    - 1.10.4. Future Directions and Research Opportunities

04

# Teaching Objectives

The objectives of the program will be to train engineers in preventive and corrective maintenance strategies for wind turbines, as well as in the implementation of advanced fault diagnosis and troubleshooting techniques. The program will also promote an understanding of relevant health, safety, and environmental regulations, working within a solid regulatory framework. Furthermore, professionals will become familiar with monitoring and control systems, such as SCADA, to optimize operational performance, as well as with cost analysis and strategies to reduce them.



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*The main goal of the program will be to equip you with the skills and knowledge needed to effectively manage the operation and maintenance of wind turbines in various environments”*



## General Objectives

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- ♦ Determine the importance of operations and maintenance in wind farms
- ♦ Analyze different maintenance strategies and their impact on the reliability and efficiency of wind turbines
- ♦ Evaluate advanced monitoring and control technologies used to optimize the operation and maintenance of wind farms
- ♦ Develop practical skills for cost management and economic planning of O&M programs in Wind Energy



*You will become familiar with emerging technological innovations and the specific challenges of offshore wind turbine maintenance, using the best educational materials at the forefront of technology and education”*





## Specific Objectives

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- Determine preventive and corrective maintenance strategies and how they are implemented in wind farms
- Apply fault diagnosis techniques and troubleshooting for wind turbines
- Implement scheduled maintenance protocols and inspections using advanced tools
- Examine health, safety, and environmental regulations relevant to O&M in Wind Energy
- Use advanced monitoring and control systems, such as SCADA, to improve operational performance
- Analyze the specific O&M challenges and strategies for offshore wind turbines
- Evaluate the cost structure and develop strategies to reduce maintenance costs
- Explore emerging technological innovations and their application in wind turbine maintenance

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”*

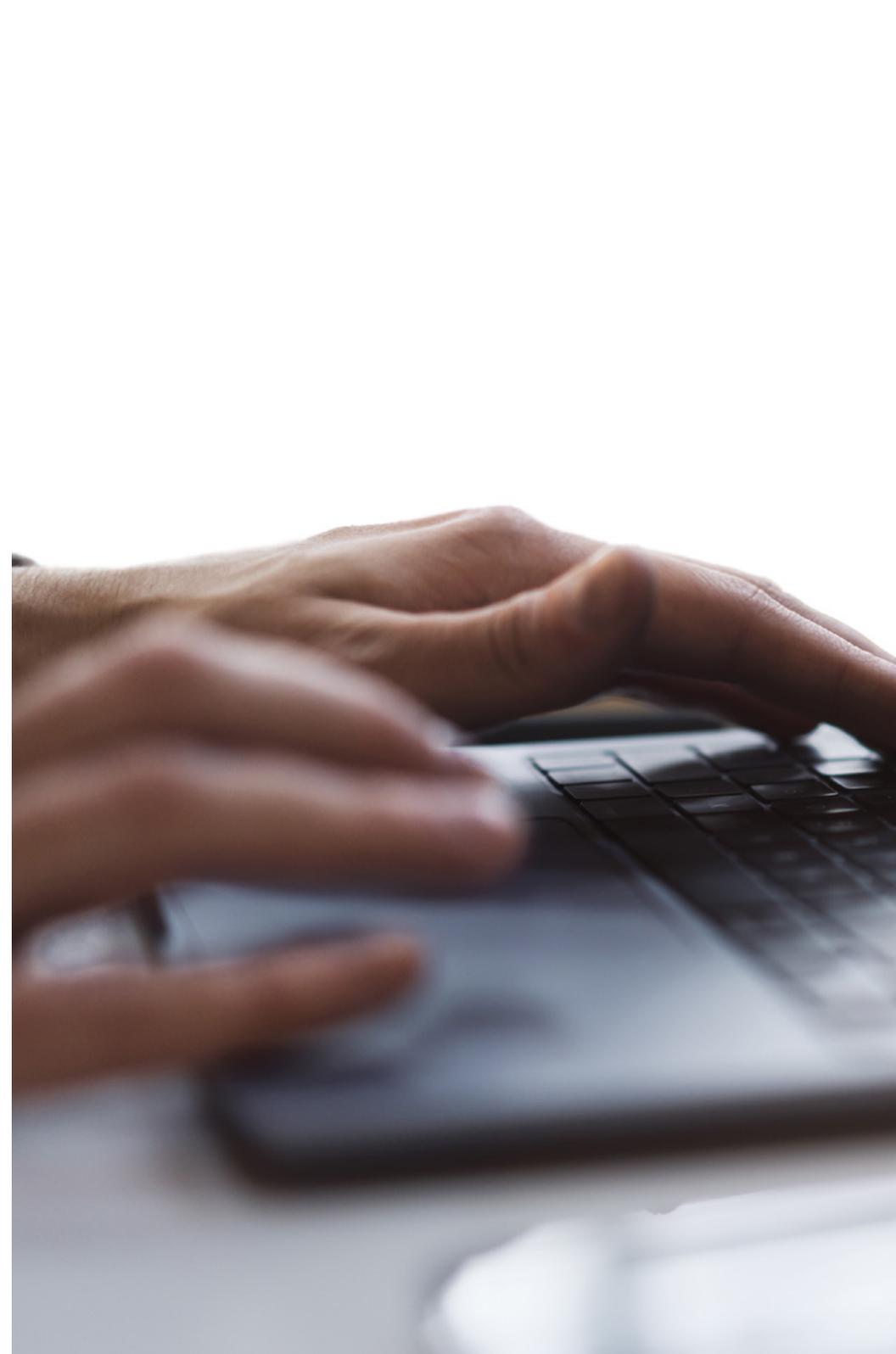
### The student: the priority of all TECH programs

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

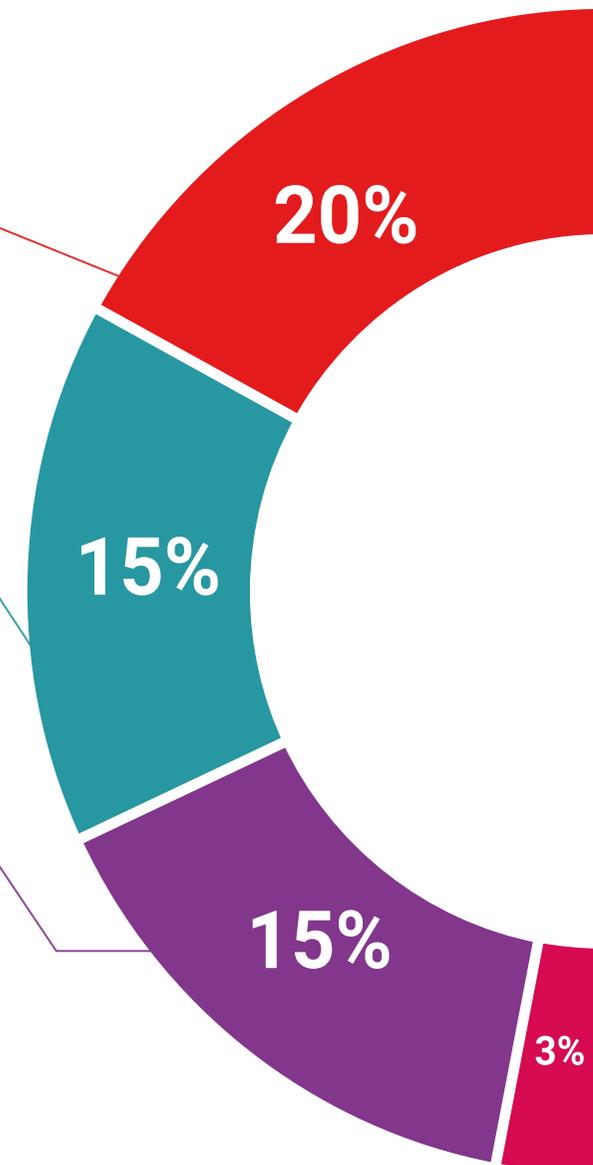
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

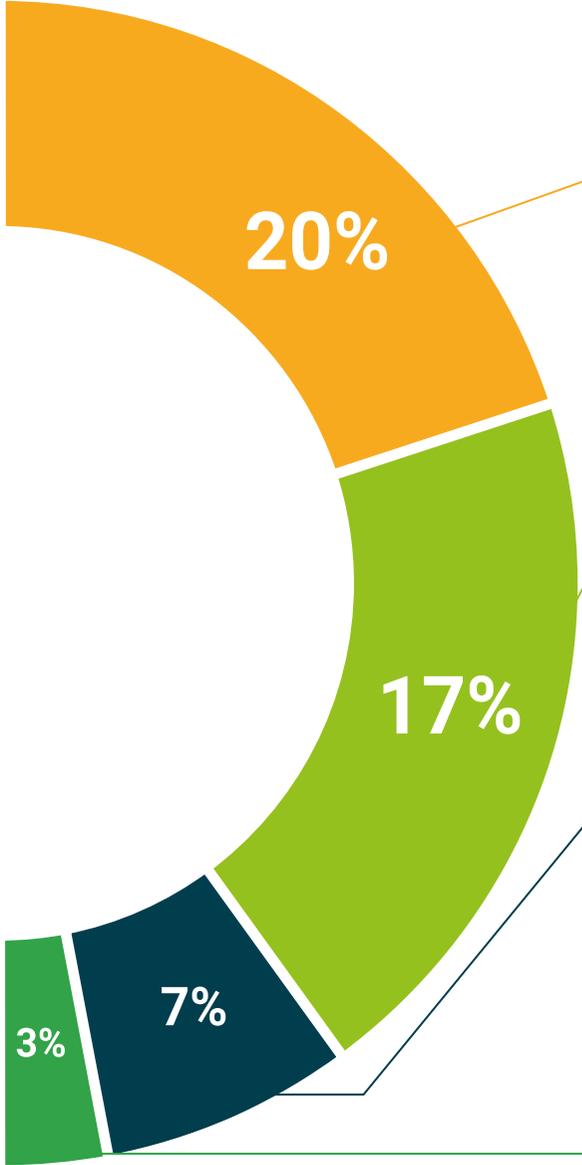
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

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





**Case Studies**

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



**Testing & Retesting**

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



**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 for future difficult decisions.



**Quick Action Guides**

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical and effective way to help students progress in their learning.



# 06

## Teaching Staff

The teachers are highly qualified professionals with a solid academic background and extensive experience in the Renewable Energy sector. In fact, they have worked directly in the operation and maintenance of wind turbines, which will allow them to offer a practical and realistic perspective on the challenges and opportunities in this field. They are also up-to-date with the latest technological innovations and trends in the industry, which will enrich the learning experience. Additionally, their teaching approach will combine theory and practice, using case studies and simulations that will allow graduates to apply their knowledge in real-world situations.





“

*Thanks to the expertise of the faculty, you will gain technical knowledge and develop critical skills to solve problems and make informed decisions in a dynamic work environment”*

## 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. De Oliveira, Roberth

- ◆ Fleet Performance Engineer at GE Vernova
- ◆ EMEA Fleet Support Specialist at GE Vernova
- ◆ Automation Project Engineer at ENC Energy
- ◆ Operations Support Engineer for Venezuela, Trinidad and Tobago at Schlumberger Drilling & Measurements
- ◆ Field Engineer (MWD and LWD) at Schlumberger Drilling & Measurements
- ◆ Degree in Electronic Engineering and Telecommunications from Dr. Rafael Beloso Chacín University

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*Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice”*

07

# Certificate

The Postgraduate Certificate in Operation and Maintenance of 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 Operation and Maintenance of 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 Operation and Maintenance of Wind Farms**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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



## Postgraduate Certificate Operation and Maintenance of Wind Farms

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# Postgraduate Certificate Operation and Maintenance of Wind Farms

## Performance

