

Postgraduate Certificate Wind Energy Systems



Postgraduate Certificate Wind Energy Systems

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

Website: www.techtute.com/us/engineering/postgraduate-certificate/wind-energy-systems

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01

Introduction

Renewable Energies are undoubtedly on the rise and this market increasingly requires specialized professionals who know how to manage them and choose those that are best in each case. Aware of this, TECH professionals have designed this very complete program whose main objective is to provide engineers with the knowledge and trends in the latest technologies available in the field of Wind Energy. Likewise, this program will study in depth to make the student understand the way in which wind energy is converted into energy and transported to the electrical grid. This knowledge will enable the engineer to take part in projects of high importance, thus enhancing his professional profile.



“

Wind energy is on the rise and increasingly requires educated professionals who can enhance its use and achieve more efficient results”

The renewable energy sector is in full international expansion and is increasingly demanding engineers specialized in this field. Therefore, the best professionals in the sector have designed for TECH this complete Postgraduate Certificate that aims to train professionals with advanced knowledge in everything that encompasses the Renewable Energy sector, specifically in Wind Energy, to increase their working position in today's energy market.

Specifically, this Postgraduate Certificate will help the engineer to understand the process in which the kinetic energy of the air is captured by means of wind turbines, until it is converted into rotational kinetic energy and transformed into electrical energy through the use of generators. During the program, the fundamentals of wind energy extraction and wind behavior (fluid dynamics) will be defined, as well as the maintenance, operation and components of wind turbines (commonly called turbines). Finally, the two types of Wind Energy; Onshore Wind Energy and Offshore Wind Energy, as well as the advantages and disadvantages of each type will be studied.

On the other hand, this Postgraduate Certificate program is based on making the student understand how wind energy is converted into energy and transported to the electrical grid. To this end, the program will focus on; defining the behavior, characteristics and potential of wind, identifying the principle of operation, the different components of wind turbines and differentiating between on-shore and off-shore wind energy.

In addition, we will study in depth its environmental impact and how to mitigate it through a good project design that allows obtaining an optimal performance with a low impact.

For all these reasons, this Postgraduate Certificate in Wind Energy integrates the most complete and innovative educational program in the current market in terms of knowledge and latest available technologies, as well as encompassing all the sectors or parties involved in this field. In addition, the program consists of exercises based on real cases of situations currently managed or previously faced by the teaching team.

This **Postgraduate Certificate in Wind Energy Systems** contains the most complete and up-to-date educational program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Renewable Energies
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ◆ Practical exercises where self-assessment can be used 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



Improving your skills in Wind Energy will give you a boost to your professional career, with greater intervention capacity and better results"

“

Learn about and apply the latest advances in Wind Energy in your daily practice and give your resume a valuable boost”

The program's teaching staff includes professionals from sector who contribute their work experience to this training 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 training programmed to train 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 academic year. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced engineering experts.

You will have innovative didactic materials and resources that will facilitate the learning process and the retention of the contents learned for a longer period of time.

A 100% online program that will allow you to combine your studies with the rest of your daily activities.



02

Objectives

TECH has designed this complete Postgraduate Certificate with the aim of helping engineering professionals to be able to design, implement and work on Wind Energy projects, having in-depth knowledge of everything related to this industry and the aspects of sustainability and climate change in the international arena that directly affect it. To this end, specific aspects of energy systems that stand out for their enormous importance in today's business landscape will be addressed, and for which large corporations are increasingly demanding competent engineers with solid specialized training.



“

With this program, TECH has only one goal: to help you grow in your profession and become a prestigious engineer”



General Objectives

- ◆ Conduct an exhaustive analysis of current legislation and the energy system, from electricity generation to the consumption phase, as well as the fundamental production factor in the economic system and the functioning of the different energy markets
- ◆ Identify the different phases required for the feasibility and implementation of a Renewable Energy project and its commissioning
- ◆ Analyze in depth the different technologies and manufacturers available to create renewable energy exploitation systems, and distinguish and critically select those qualities based on costs and their actual application
- ◆ Identify the operation and maintenance tasks required for the correct operation of Renewable Energy installations
- ◆ Size facilities for the application of all energy sources of lesser implementation such as mini-hydro, geothermal, tidal and clean vectors
- ◆ Manage and analyze relevant bibliography on a topic related to one or some of the fields of Renewable Energies, published both nationally and internationally
- ◆ Adequately interpret society's expectations on the environment and climate change, and engage in technical discussions and critical opinions on energy aspects of sustainable development, as skills that Renewable Energy professionals should have
- ◆ Integrate knowledge and face the complexity of formulating reasoned judgments in the field applicable to a company in the Renewable Energy sector
- ◆ Master the different existing solutions or methodologies for the same problem or phenomenon related to Renewable Energies and develop a critical spirit knowing the practical limitations





Specific Objectives

- ◆ Assess the advantages and disadvantages of replacing fossil fuels with Renewable Energies in different situations
- ◆ Gain in-depth knowledge to implement wind energy systems and the most appropriate types of technology to be used according to location and economic requirements
- ◆ Obtain a scientific-technical vocabulary of Renewable Energies
- ◆ Ability to develop hypotheses to address problems in the field of renewable energies, and the ability to evaluate results in an objective and coherent manner
- ◆ Understand and master the fundamental concepts of wind types and the implementation of wind measurement systems
- ◆ Understand and master the fundamental concepts of the general laws governing the capture of wind energy and wind turbine technologies
- ◆ Develop wind power plant projects

“

TECH puts at your disposal a compendium of practical cases that will be your main asset when facing real situations”

03

Course Management

TECH applies a criterion based on high quality in all its training. This guarantees students that by studying here they will find the best didactic content taught by the best professionals in the sector. In this sense, this Postgraduate Certificate in Wind Energy Systems has highly prestigious professionals in this area, who pour into the training the experience of their years of work, as well as the knowledge acquired from research in the field. All to provide the engineer with a high-level program, which will enable them to practice in national and international environments with greater guarantees of success.





“

Learn with the best and acquire the knowledge and skills you need to intervene in this area of development with total success”

International Guest Director

Varun Sivaram, Ph.D. is a **physicist, bestselling author** and leading **clean energy technology** expert with a career spanning the corporate, public and academic sectors. In fact, he has served as **Director of Strategy and Innovation at Orsted**, one of the world's leading renewable energy companies with the largest offshore wind power portfolio.

In addition, Dr. Sivaram has served in the U.S. Biden-Harris administration, as Director General for Clean Energy and Innovation, as well as Senior Advisor to Secretary John Kerry, the Special Presidential Climate Envoy to the White House. In this capacity, he was the creator of the First Movers Coalition, a key initiative to foster clean energy innovation globally.

In the academic field, he has directed the Energy and Climate Program at the Council on Foreign Relations. And his influence in the formulation of government policies to support innovation has been remarkable, having advised leaders such as the mayor of Los Angeles and the governor of New York. He has also been recognized as a Young Global Leader by the World Economic Forum.

In addition, Dr. Varun Sivaram has published several influential books, including "Taming the Sun: Innovations to Harness Solar Energy and Power the Planet" and "Energizing America: A Roadmap to Launch a National Energy Innovation Mission", both of which have received accolades from prominent leaders such as Bill Gates. In fact, his contribution to the clean energy field has been recognized internationally, being included in the TIME 100 Next list and incorporated by Forbes in its Forbes 30 Under 30 list in Law and Policy, among other major accolades.



Dr. Sivaram, Varun

- Director of Strategy and Innovation at Ørsted, United States
- Managing Director, Clean Energy and Innovation // Senior Advisor to Secretary John Kerry, U.S. Special Presidential Climate Envoy at The White House
- Chief Technology Officer at ReNew Power
- Strategic Advisor for Energy and Finance on Reforming the Energy Vision at the New York Governor's Office
- Ph.D. in Condensed Matter Physics from Oxford University
- B.S. in Engineering Physics and International Relations from Stanford University.
- Awards: Forbes 30 Under 30, awarded by Forbes magazine
Grist Top 50 Leaders in Sustainability, awarded by Grist magazine
MIT TR Top 35 Innovators, awarded by MIT Tech Review Magazine
TIME 100 Next Most Influential People in the World, awarded by TIME Magazine
- Young Global Leader, awarded by the World Economic Forum
- Member of: Atlantic Council ,Breakthrough Institute , Aventurine Partners



Thanks to TECH, you will be able to learn with the best professionals in the world"

Management



Mr. De la Cruz Torres, José

- ♦ Degree in Physics and Industrial Electronics Engineering, University of Seville
- ♦ Master's Degree in Operations Management by EADA Business School Barcelona
- ♦ Master's Degree in Industrial Maintenance Engineering, University of Huelva, Spain
- ♦ Railway Engineering, UNED
- ♦ South head of the appraisal, assessment and valuation of technologies and processes of Renewable Energy generation facilities at RTS International Loss Adjusters



Mr. Lillo Moreno, Javier

- ♦ Telecommunications Engineer, University of Seville
- ♦ Master's Degree in Project Management and Master's Degree in Big Data & Business Analytics, School of Industrial Organization (EOI)
- ♦ With an extensive professional career in the Renewable Energy sector of more than 15 years
- ♦ Has managed the O&M areas of several companies with high visibility in the sector

Professors

Álvarez Morón, Gregorio

- ◆ Agronomist Engineer specializing in Rural Engineering
- ◆ Lecturer in collaboration with WATS Ingeniería, a Spanish company specialized in water, agronomy, energy and environmental engineering
- ◆ With more than 15 years of experience in public and private companies

Dr. De la Cal Herrera, José Antonio

- ◆ Industrial engineer, Polytechnical University of Madrid
- ◆ MBA in Business Administration and Management from the Business School of Commercial and Marketing Management, ESIC
- ◆ Doctor, University of Jaén
- ◆ Former Head of the Renewable Energy Department of AGECAM, S.A., Energy Management Agency of Castilla-La Mancha
- ◆ Associate Professor of the Department of Business Organization, University of Jaén

Despouy Zulueta, Ignacio

- ◆ Head of Projects and Head of Discipline of WSP CHILE
- ◆ Civil Hydraulic Engineer, University of Chile
- ◆ Professional Master's Degree in Environment and Resource Management at Vrije Universiteit (VU) Amsterdam (2008 - 2009)
- ◆ Diploma in European Energy Manager of the Chilean-German Chamber (2015)
- ◆ Founder and Senior Consultant of Eficiencia Ambiental Spa
- ◆ Head of Projects for Arcadis Chile

Díaz Martín, Jonay Andrés

- ◆ Higher industrial engineer specialized in Electricity, University of Las Palmas de Gran Canaria
- ◆ Master's Degree in International Logistics and Supply Chain Management, EUDE Business School
- ◆ Professional Master's Degree in Integrated Management of Prevention, Quality and Environment, Universidad Camilo José Cela

Granja Pacheco, Manuel

- ◆ Civil Engineer, Alfonso X El Sabio University
- ◆ Master's Degree in Renewable Energy Installation Management and Project Internationalization by ITE (Instituto Tecnológico de la Energía)
- ◆ Manages the operations of a company specialized in the development of Renewable Energy projects, with a track record of more than 3,000 MW of projects at national and international level

Pérez García, Fernando

- ◆ Industrial Technical Engineer specialized in Electricity, University of Zaragoza
- ◆ Insurance appraiser specialized in the adjustment and appraisal of industrial risks, technical and energy claims, especially in the Renewable Energy sector (wind, hydro, photovoltaic, solar thermal and biomass)

Montoto Rojo, Antonio

- ◆ Electronics Engineer, University of Seville
- ◆ MBA Master's Degree Camilo José Cela University
- ◆ Account Manager for storage systems at Gamesa Electric

Trillo León, Eugenio

- ◆ Industrial Engineer specialized in Energy, University of Seville
- ◆ Master's Degree in Industrial Maintenance Engineering, University of Huelva, Spain
- ◆ Expert in Project Management, University of California-Los Angeles
- ◆ CEO of The Lean Hydrogen Company
- ◆ Secretary of the Andalusian Hydrogen Association

Ms. Silvan Zafra, Álvaro

- ◆ Energy Engineer, University of Seville
- ◆ Master in Thermal Energy Systems and Business Administration
- ◆ Senior Consultant focused on the execution of international E2E projects in the energy sector
- ◆ Responsible for the market management of more than 15 GW of installed capacity for clients such as Endesa, Naturgy, Iberdrola, Acciona and Engie

González Hierro, Francisco

- ◆ Business Operations Officer at Repsol Renovables, Madrid
- ◆ Professor in several courses on Renewable Energies, as well as at the Higher Technical School of Industrial Engineers, ICAI-ICADE Comillas Pontific University
- ◆ Head of Saeta Yield Operations Management
- ◆ Industrial Engineer, specializing in Mechanical Engineering, Industrial Engineering, ICAI-ICADE Comillas Pontific University

Dr. Ibáñez Gil de Ramales, Mariana

- ◆ Wind Turbine Commissioning Technician at High Wind Services
- ◆ Ph.D. in Wind Energy, GCU, Glasgow Caledonian University
- ◆ Technical Industrial Engineering, specializing in Electricity, UPV, Polytechnic University of Valencia
- ◆ 12-month Master's Degree in Energy and Environmental Management, GCU, Glasgow Caledonian University
- ◆ Master's Degree in Renewable Energies by ITMD, Technological Institute
- ◆ Practical Photovoltaic Energy Course by UPV, Polytechnic University of Valencia
- ◆ Wind Farm Maintenance Technician Course by AEE, Asociación Empresarial Eólica (Spanish Wind Energy Business Association)

Caballero López, Jaime

- ◆ Industrial Technical Engineer Specialized in Mechanics, University of Seville
- ◆ Master's Degree in Industrial Engineering and Maintenance Management, University of Seville
- ◆ Production and personnel management at the Helioenergy I and II Thermosolar Platform, Abengoa Solar
- ◆ Plant control room operations expert with METSO program
- ◆ Helioenergy I and II Solar Thermal Platform Control Room Operator, Bester Generación, 2012
- ◆ Responsible for supervision and control in the construction and start-up of the Soleval I Thermosolar Plant (50 MW) Lebrija. ATISAE Online University, 2011



04

Structure and Content

The syllabus of the Postgraduate Certificate is configured as a complete tour through each and every one of the skills necessary to understand and assume the ways of working in this field. Thus, through an innovative didactic approach, based on the practical application of the contents, the engineer will learn and understand the functioning of Wind energy, knowing how to design and implement projects in this sense, providing high levels of safety and services to companies. This, in addition to adding value to your professional profile, will make you a much better prepared professional to work in a variety of environments.





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The best professionals in the sector have designed for TECH the most complete and up-to-date syllabus on the market. This way, you'll be sure to learn from the best teaching content."

Module 1. Wind Energy Systems

- 1.1. The Wind as a Natural Resource
 - 1.1.1. Wind Behavior and Classification
 - 1.1.2. The Wind Resource in our Planet
 - 1.1.3. Wind Resource Measurements
 - 1.1.4. Wind Energy Prediction
- 1.2. Wind Energy
 - 1.2.1. Wind Energy Evolution
 - 1.2.2. Temporal and Spatial Variability of the Wind Resource
 - 1.2.3. Wind Energy Applications
- 1.3. The Wind Turbine
 - 1.3.1. Types of Wind Turbines
 - 1.3.2. Parts of a Wind Turbine
 - 1.3.3. Functioning of a Wind Turbine
- 1.4. Wind Generator
 - 1.4.1. Asynchronous Generators: Coiled Rotor
 - 1.4.2. Asynchronous Generators: Squirrel Cage
 - 1.4.3. Synchronous Generators: Independent Activation
 - 1.4.4. Permanent Magnet Synchronous Generators
- 1.5. Site Selection
 - 1.5.1. Basic Criteria
 - 1.5.2. Specific Aspects
 - 1.5.3. On-Shore and Off-Shore Wind Power Plants
- 1.6. Operation of a Wind Farm
 - 1.6.1. Operating Model
 - 1.6.2. Control Operations
 - 1.6.3. Remote Operation
- 1.7. Wind Park Maintenance
 - 1.7.1. Maintenance Classes: Corrective, Preventive and Predictive
 - 1.7.2. Main Failures
 - 1.7.3. Machine Improvement and Resource Organization
 - 1.7.4. Maintenance Costs (OPEX)





- 1.8. Wind Energy Impact and Environmental Maintenance
 - 1.8.1. Impact on Flora and Erosion
 - 1.8.2. Impact on Avifauna
 - 1.8.3. Visual and Sound Impact
 - 1.8.4. Environmental Maintenance
- 1.9. Data and Performance Analysis
 - 1.9.1. Energy Production and Revenue
 - 1.9.2. Control Indicators KPIs
 - 1.9.3. Wind Park Performance
- 1.10. Wind Park Design
 - 1.10.1. Design Considerations
 - 1.10.2. Wind Turbine Arrangement
 - 1.10.3. Effect of the Trails on the Distance Between Wind Turbines
 - 1.10.4. Medium and High Voltage Equipment
 - 1.10.5. Installation Costs (CAPEX)

“ *A unique learning opportunity that will catapult your career to the next level Don't let it slip away.*”

05

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.





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Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

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At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world”



You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.



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

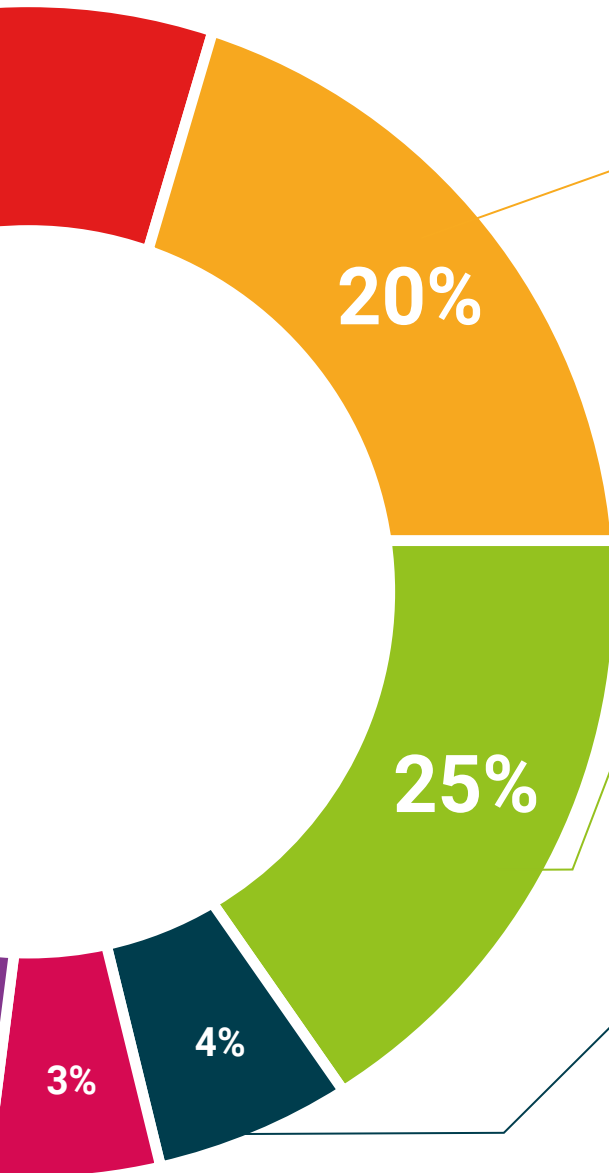
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



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 Wind Energy Systems 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 program will allow you to obtain your **Postgraduate Certificate in Wind Energy Systems** 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** title 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 Wind Energy Systems**

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.

future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present quality

online train

development language

virtual classroom

tech global
university

Postgraduate Certificate Wind Energy Systems

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

Postgraduate Certificate

Wind Energy Systems

