

# Postgraduate Certificate

## Hydrogen Vehicle Refueling Stations





## Postgraduate Certificate

### Hydrogen Vehicle Refueling Stations

- » 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/hydrogen-vehicle-refueling-stations](http://www.techtute.com/us/engineering/postgraduate-certificate/hydrogen-vehicle-refueling-stations)

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# 01

# Introduction

Hydrogen as an energy vector has found a great ally in the mobility sector for its technical development and integration in different vehicle models. Therefore, in recent years, large automobile companies have promoted the creation of projects along these lines. Likewise, the refueling station design, which will replace traditional fossil fuel stations in the future, is of great importance in this process. In this technological innovation landscape, it is vital for the engineering professional to be specialized if they wish to prosper in this field. That is why TECH offers this Postgraduate Certificate, which provides the most advanced knowledge about the types of hydrogen generators and the different elements necessary for their operation, as well as the systems required to use hydrogen. In addition, in a 100% online academic format and with the most advanced quality content, elaborated by professionals in the sector.



# H<sub>2</sub>



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*In just 6 weeks you will obtain the knowledge you need about Hydrogen Vehicle Refueling Stations and professionally grow in this sector”*

A few decades ago, seeing hydrogen vehicles on the road was just an idea, but today it is already a reality. Although it is true that the volume is lower compared to diesel or gasoline-powered cars, the urgent need to reduce pollution has made this energy alternative the most suitable. This has led major automobile companies to promote the development of hydrogen-based infrastructure and means of transportation.

In addition, the existence of these vehicles requires the creation of refueling stations. Specifically, Europe and Asia are leading the way in the promotion of these technologies, so that technical, scientific and regulatory knowledge has developed around this energy option, which in turn regulates the safety of its use and implementation. In this scenario, it is unquestionable that the engineering professional who wishes to prosper in this sector must be updated on the advances that are taking place. In view of this reality, TECH offers the graduate an intensive education through the Postgraduate Certificate in Hydrogen Vehicle Refueling Stations.

A Postgraduate Certificate, which will take you over 6 weeks, to deepen in the design of hydrogen generators, the currently existing models and the techniques required for the compression and dispensing of this gas. For this purpose, students also have at their disposal a theoretical and practical syllabus complemented with innovative learning material, in which the latest technology applied to academic teaching has been used.

A 100% online Postgraduate Certificate, which the graduate can access comfortably whenever and wherever they wish. You only need a computer, tablet or cell phone with internet connection to access content at any time of the day, which will allow you to obtain the most outstanding and relevant information, growing professionally in an expanding sector.

This **Postgraduate Certificate in Hydrogen Vehicle Refueling Stations** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ The development of case studies presented by Engineering experts
- ◆ The graphic, schematic and eminently practical contents of the book provide technical and practical information on those disciplines that are essential for professional practice
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ Theoretical lessons, questions to the expert, discussion forums on controversial topics and individual reflection papers
- ◆ The availability to access the content from any fixed or portable device with internet connection



*A program that will introduce you through multimedia pills in a scientific-technical knowledge about the operation of a hydrogen refueling station"*

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*Enroll now in a 100% online Postgraduate Certificate, flexible and compatible with your daily life activities”*

The program includes, in its teaching staff, professionals from the sector who bring to this program the experience of their work, as well as renowned specialists from reference societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will allow the professional a situated and contextual learning, meaning a simulated environment that will provide an immersive education programmed to be trained in real situations.

The design of this program focuses on problem-based learning, through which the professional must try to solve the different professional practice situations that arise during the academic year. For this purpose, it will be aided by an innovative interactive video system developed by renowned experts.

*You are one step away from prospering in your professional career through a Postgraduate Certificate that will allow you to expand your knowledge of the hydrogen vehicle filling process.*

*This program will allow you to be updated on the compression and optimization technologies used in hydropower plants.*



# 02 Objectives

The main purpose of this Postgraduate Certificate in Hydrogen Vehicle Refueling Stations is to instruct the graduate to be able, upon completion of this program, to develop the operation of a hydrogen refueling station. For this purpose, this program offers the necessary knowledge for its design, the required techniques, as well as the existing solutions to the different problems related to dispensing. In addition, TECH includes pedagogical tools that will enable students to learn in an agile and attractive way.







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*You will be able to integrate the techniques and methodologies provided by the case studies developed by the excellent teaching staff of this Postgraduate Certificate into your professional performance"*



## General objectives

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- ◆ To develop the operation of a hydrogen refueling station
- ◆ To assimilate the proposed hydrogen refueling station design methodology
- ◆ To be able to perform techno-economic modeling of a hydrogen facility



*Get the knowledge you need to lead projects that develop and design hydrogen refueling stations”*





### Specific objectives

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- ◆ To establish the different types of hydrogen refueling stations
- ◆ To learn the design parameters
- ◆ To compile storage strategies at different pressure levels
- ◆ To analyze dispensing and its associated problems
- ◆ To master the concepts of safety and associated regulations
- ◆ To specialize the student in modeling the operation of a hydrogen refueling station

03

# Course Management

This academic program includes the most specialized teaching staff in the current educational market. They are specialists selected by TECH to develop the whole syllabus. In this way, starting from their own existence and the latest evidence, they have designed the most up-to-date content that provides a guarantee of quality in such a relevant subject.



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*TECH offers the most specialized teaching staff in the field of study. Enroll now and enjoy the quality you deserve”*

## International Guest Director

With an extensive professional background in the energy sector, Adam Peter is a prestigious electrical engineer who stands out for his commitment to the use of clean technologies. Likewise, his strategic vision has driven innovative projects that have transformed the industry towards more efficient and environmentally friendly models.

In this way, he has worked in leading international companies such as Siemens Energy in Munich. In this way, he has held leadership roles ranging from Sales Management or Corporate Strategy Management to Market Development. Among his main achievements, he has led the Digital Transformation of organizations in order to improve their operational flows and maintain their competitiveness in the market in the long term. For example, he has implemented Artificial Intelligence to automate complex tasks such as predictive monitoring of industrial equipment or optimization of energy management systems.

In this regard, it has created multiple innovative strategies based on advanced data analysis to identify both patterns and trends in electricity consumption. As a result, companies have optimized their informed decision-making in real time and have been able to reduce their production costs significantly. In turn, this has contributed to companies' ability to adapt nimbly to market fluctuations and respond with immediacy to new operational needs, ensuring greater resilience in a dynamic working environment.

He has also led numerous projects focused on the adoption of renewable energy sources such as wind turbines, photovoltaic systems and cutting-edge energy storage solutions. These initiatives have enabled institutions to optimize their resources efficiently, guarantee a sustainable supply and comply with current environmental regulations. Undoubtedly, this has positioned the company as a reference in both innovation and corporate responsibility.



## Mr. Peter, Adam

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- ♦ Head of Hydrogen Business Development at Siemens Energy, Munich, Germany
- ♦ Sales Director at Siemens Industry, Munich
- ♦ President of Rotating Equipment for Upstream/Midstream Oil & Gas
- ♦ Market Development Specialist at Siemens Oil & Gas, Munich
- ♦ Electrical Engineer at Siemens AG, Berlin
- ♦ Degree in Electrical Engineering at the University of Applied Sciences Dieburg

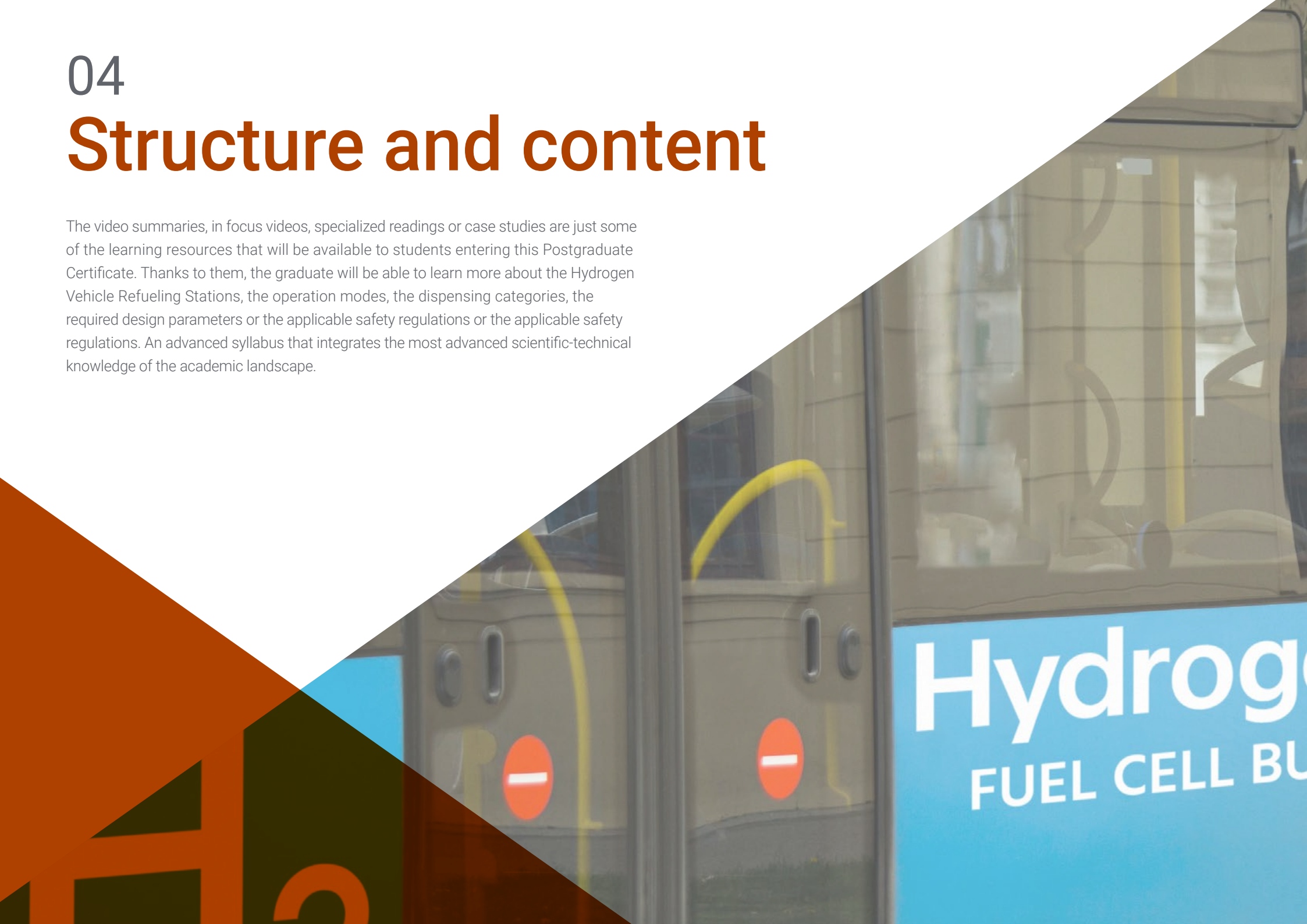
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*Thanks to TECH, you will be able to learn with the best professionals in the world”*

# 04

## Structure and content

The video summaries, in focus videos, specialized readings or case studies are just some of the learning resources that will be available to students entering this Postgraduate Certificate. Thanks to them, the graduate will be able to learn more about the Hydrogen Vehicle Refueling Stations, the operation modes, the dispensing categories, the required design parameters or the applicable safety regulations or the applicable safety regulations. An advanced syllabus that integrates the most advanced scientific-technical knowledge of the academic landscape.





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*A syllabus designed to provide you with the most advanced multimedia content on hydrogen refueling station design parameters in just 6 weeks"*

## Module 1. Hydrogen Vehicle Refueling Stations

- 1.1. Hydrogen Vehicle Refueling Corridors and Networks
  - 1.1.1. Hydrogen Vehicle Refueling Networks. Current state
  - 1.1.2. Hydrogen Vehicle Refueling Station Deployment Objectives at a global level
  - 1.1.3. Cross-Border Corridors for Hydrogen Refueling
- 1.2. Hydrogenerator Types, Operation Modes and Dispensing Categories
  - 1.2.1. Hydrogen Refueling Station Types
  - 1.2.2. Hydrogen refueling station operating modes
  - 1.2.3. Dispensing categories according to regulations
- 1.3. Design Parameters
  - 1.3.1. Hydrogen refueling station. Elements
  - 1.3.2. Design Parameters by Hydrogen Storage Type
  - 1.3.3. Design Parameters by Station Target Use
- 1.4. Storage and Pressure Levels
  - 1.4.1. Hydrogen Gas storage in hydrogen refueling stations
  - 1.4.2. Gas storage pressure levels
  - 1.4.3. Liquid hydrogen storage in hydrogen refueling stations
- 1.5. Compression Stages
  - 1.5.1. Hydrogen compression. Necessity
  - 1.5.2. Compression technologies
  - 1.5.3. Optimization
- 1.6. Dispensing and Precooling
  - 1.6.1. Pre-cooling according to regulations and vehicle type. Necessity
  - 1.6.2. Hydrogen dispensing cascade
  - 1.6.3. Dispensing thermal phenomena
- 1.7. Mechanical Integration
  - 1.7.1. Refueling stations with on-site hydrogen production
  - 1.7.2. Refueling stations without hydrogen production
  - 1.7.3. Modularization

- 1.8. Applicable Regulations
  - 1.8.1. Safety regulations
  - 1.8.2. Hydrogen quality standards, certificates
  - 1.8.3. Civil regulations
- 1.9. Preliminary Design of a Hydrogen Plant
  - 1.9.1. Case study presentation
  - 1.9.2. Case study development
  - 1.9.3. Resolution
- 1.10. Cost Analysis
  - 1.10.1. Capital and operating costs
  - 1.10.2. Technical characterization of the operation of a hydrogen refueling station
  - 1.10.3. Techno-economic modeling



*With this program you will be aware of the applicable safety regulations in Hydrogen Vehicle Refueling Stations"*

# H<sub>2</sub>



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.*



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

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.





In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

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

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

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



### Practising Skills and Abilities

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



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





**Case Studies**

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



**Interactive Summaries**

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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



**Testing & Retesting**

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.



06

# Certificate

The Postgraduate Certificate in Hydrogen Vehicle Refueling Stations 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 Postgraduate Certificate without traveling or cumbersome paperwork”*

This program will allow you to obtain your **Postgraduate Certificate in Hydrogen Vehicle Refueling Stations** 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 Hydrogen Vehicle Refueling Stations**

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  
development languages  
virtual classroom



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