Postgraduate Diploma
Hydrogen Projects

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Postgraduate Diploma

Hydrogen Projects

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Global University**
- Credits: **24 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/engineering/postgarduate-diploma/postgraduate-diploma-hydrogen-projects**

Index

01

Introduction

In the 70s, the first industrial projects based on the use of hydrogen were born. However, following the Paris Agreement in 2016, there was an acceleration of the decarbonization process, which spurred the development of new uses of Hydrogen in transportation, buildings and power generation. However, carrying out these actions requires a firm commitment on the part of the companies, which must first carry out an important market analysis and feasibility study. Given the relevance of this factor in the execution of these projects, TECH has created this program, which offers engineering professionals the most advanced content on the current situation of the sector, the existing regularization and the essential technical-economic analysis in Hydrogen Projects. All this in a 100% online format and with the most relevant content, prepared by experts with extensive professional experience in the sector.

This Postgraduate Diploma will lead you to be able to model the behavior of fuel cells technically and economically"

The oil and steel industry represented the traditional market for hydrogen. However, technical and technological development, as well as advances in the scientific community, have led to the use of this chemical element in other sectors such as glass and transportation. Likewise, the decarbonization plans and policies carried out by most of the world's countries have turned hydrogen into an energy vector that will facilitate decarbonization.

Therefore, for the implementation of any project in this line, the engineering professional must master concepts THAT go into the existing regulatory regulations, as well as the different study and feasibility techniques, essential for obtaining financing and obtaining optimal results in any company. A knowledge that TECH has decided to compile in this Postgraduate Diploma in Hydrogen Projects, which the professional will be able to access comfortably, 24 hours a day, from any electronic device with internet connection.

A program developed by a specialized teaching team with extensive professional experience in the sector, both in the direction and management of projects and in the research of the different uses of hydrogen. This will allow the student to access the most important and current information on the laws affecting hydrogen in its various applications or the study of the risks and consequences to safeguard the integrity of people, equipment and the environment.

In addition, through multimedia pills and practical case studies, you will be able to delve into the feasibility study of a project, methods of obtaining financing and profitability indicators. In addition, thanks to the *Relearning* system, based on content repetition, you will acquire advanced learning without long study and memorization hours.

A 100% online program that offers professionals the opportunity to make significant progress in a booming sector. This will be possible thanks to an academic format that does not require attendance or classes with fixed schedules and gives students the freedom to distribute the course load according to their needs.

This **Postgraduate Diploma in Hydrogen Projects** contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical case studies presented by engineering experts
- The graphic, schematic and practical contents of the book provide technical and practical information on those 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

This Postgraduate Diploma will lead you to investigate the applications of fuel cells in mobility, electricity generation or thermal generation"

You are just one step away from enrolling in a qualification that will give you convenient 24-hour access to the most advanced curriculum on the creation of businesses based on the use of Hydrogen"

You will have the essential knowledge to define the objectives and impact of any initiative focused on the use of hydrogen as a feedstock.

Delve through this online program into the most appropriate structures for the financing of these projects.

The program's teaching staff includes professionals from sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its 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 an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

02

Objectives

The syllabus of this Postgraduate Diploma has been elaborated with the main purpose of providing the most advanced and exhaustive knowledge on the current panorama of Hydrogen Projects. This way, at the end of this program, the graduate will be aware of the current renewable hydrogen business models for its implementation in different markets, the risks it faces and the measures that are being established or are planned in the short term for its mitigation.

This Postgraduate Diploma will allow you to lead, plan and manage green hydrogen production projects"

General Objectives

- To know the Assessment of actual hydrogen projects
- To know the explanation of the guarantee of origin system and the need for it
- To study the safety of hydrogen installations
- Learn about the certification process of installations
- Learn how to develop a feasibility analysis and its different scenarios

With an eminently practical approach you will be able to understand the keys to perform a technical-economic analysis in Hydrogen Projects"

Specific Objectives

Module 1. Hydrogen Markets

- To understand the different markets in which hydrogen can penetrate
- To understand the Hydrogen sales price bands according to end-uses
- To analyze current hydrogen production and demand
- To understand hydrogen market expansion plans

Module 2. Explain the System of Guarantees of Origin and the Need For It

- To study best practices for hydrogen project deployment
- To recognize the documentation required by the administration
- Delve into key application directives

Module 3. Hydrogen Project Planning and Management

- Compile project management tools
- Explore the different parts of project planning
- To raise awareness of the importance of project risk identification and management

Module 4. Technical-Economic and Feasibility Analysis of Hydrogen Projects

- To develop expertise on techno-economic and feasibility analysis of hydrogen projects
- To determine the structuring of hydrogen projects and their financing
- To Analyze the keys to electricity supply for green hydrogen production

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.

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

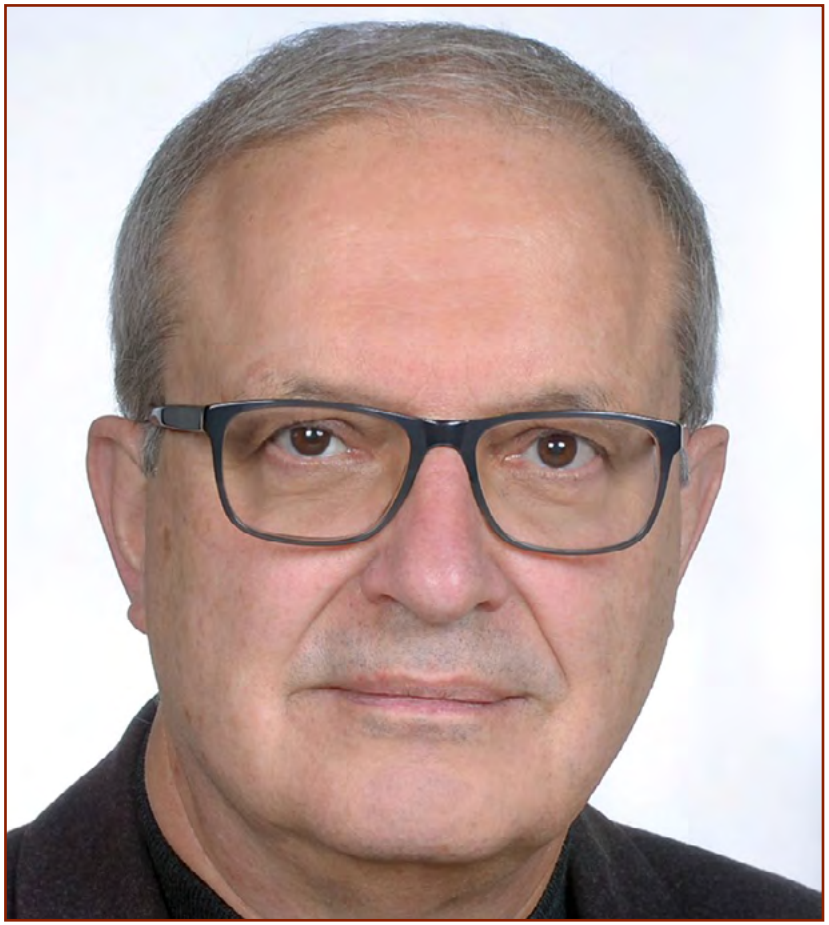
International Guest Director

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

- 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

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

04

Structure and Content

TECH provides students taking this degree with the most innovative pedagogical tools (video summaries of each topic, detailed videos, diagrams, specialized readings and case studies), which will lead them in a much more dynamic way to delve into the current energy market, as well as all the elements and factors that are essential in the process of planning, management and development of any Hydrogen project. Likewise, thanks to the Relearning system, the graduate will be able to reduce the hours of study and memorization so characteristic of other teaching methods.

A theoretical and practical syllabus that will bring you closer to the reality of the current Hydrogen market and its impact on the global energy system"

Module 1. Hydrogen Markets

1.1. Energy Markets
- 1.1.1. Integration of Hydrogen in the Gas Market
- 1.1.2. Interaction of Hydrogen Price with Fossil Fuels Prices
- 1.1.3. Interaction of the Hydrogen Price with the Electricity Market Price

1.2. Calculation of LCOHs and Sales Price Bands
- 1.2.1. Presentation of the Case Study
- 1.2.2. Development of the Case Study
- 1.2.3. Resolution

1.3. Global Demand Analysis
- 1.3.1. Current Hydrogen Demand
- 1.3.2. Hydrogen Demand Derived from New Uses
- 1.3.3. Objectives to 2050

1.4. Analysis of Hydrogen Production and Types of Hydrogen
- 1.4.1. Current Hydrogen Production
- 1.4.2. Green Hydrogen Production Plans
- 1.4.3. Impact of Hydrogen Production on the Global Energy System

1.5. International Roadmaps and Plans
- 1.5.1. Submission of International Plans
- 1.5.2. Analysis of International Plans
- 1.5.3. Comparison between Different International Plans

1.6. Green Hydrogen Market Potential
- 1.6.1. Green Hydrogen into the Natural Gas Grid
- 1.6.2. Green Hydrogen in Mobility
- 1.6.3. Green Hydrogen in Industries

1.7. Analysis of Large-Scale Projects in the Deployment Phase: USA, Japan, Europe, China
- 1.7.1. Project Selection
- 1.7.2. Analysis of Selected Projects
- 1.7.3. Conclusions

1.8. Centralization of Production: Countries with Export and Import Potential
- 1.8.1. Renewable Hydrogen Production Potential
- 1.8.2. Renewable Hydrogen Import Potential
- 1.8.3. Transportation of Large Volumes of Hydrogen

1.9. Guarantees of Origin
- 1.9.1. Need for a System of Guarantees of Origin
- 1.9.2. CertifHy
- 1.9.3. Approved Systems of Guarantees of Origin

1:10. Hydrogen Supply Contracts: *Offtake Contracts*
- 1.10.1. Importance of *Offtake Contracts* for Hydrogen Projects
- 1.10.2. *Offtake Contract* keys: price, volume and duration
- 1.10.3. Review of a Standard Contract Structure

Module 2. Explain the System of Guarantees of Origin and the Need For It

2.1. EU Policies
- 2.1.1. European Hydrogen Strategy
- 2.1.2. REPowerEU Plan
- 2.1.3. Hydrogen Roadmaps in Europe

2.2. Incentive Mechanisms for the Deployment of the Hydrogen Economy
- 2.2.1. Need for Incentive Mechanisms for the Deployment of the Hydrogen Economy
- 2.2.2. Incentives at European Level
- 2.2.3. Examples of Incentives in European Countries

2.3. Regulation Applicable to Production and Storage, Use of Hydrogen in Mobility and in the Gas Grid
- 2.3.1. Applicable Regulation for Production and Storage
- 2.3.2. Applicable Regulation for the Use of Hydrogen in Mobility
- 2.3.3. Regulation Applicable for the Use of Hydrogen in the Gas Grid

2.4. Standards and Best Practices in Security Plan La Implementation
- 2.4.1. Applicable Standards: CEN/CELEC
- 2.4.2. Good Practices in the Implementation of the Security Plan
- 2.4.3. Hydrogen Valleys

2.5. Required Project Documentation
- 2.5.1. Technical Projects
- 2.5.2. Environmental Documentation
- 2.5.3. Certification

2.6. European Directives Application Key: PED, ATEX, LVD, MD and EMC
- 2.6.1. Pressure Equipment Regulations
- 2.6.2. Explosive Atmosphere Regulations
- 2.6.3. Chemical Storage Regulations

2.7. International Hazard Identification Standards: HAZID/HAZOP Analysis
- 2.7.1. Hazard Analysis Methodology
- 2.7.2. Risk Analysis Requirements
- 2.7.3. Execution of Risk Analysis

2.8. Plant Safety Level Analysis: SIL Analysis
- 2.8.1. SIL Analysis Methodology
- 2.8.2. SIL Analysis Requirements
- 2.8.3. SIL Analysis Execution

2.9. Certification of Installations and CE Marking
- 2.9.1. Necessity of Certification and CE Marking
- 2.9.2. Authorized Certification Agencies
- 2.9.3. Documentation

2:10. Permits and Approval: Case Study
- 2.10.1. Technical Projects
- 2.10.2. Environmental Documentation
- 2.10.3. Certification

Module 3. Hydrogen Project Planning and Management

3.1. Scope Definition: Project Type
- 3.1.1. Importance of Good Scope Definition
- 3.1.2. EDP OR WBS
- 3.1.3. Scope Management in Project Development

3.2. Characterization of Actors and Entities Interested in Hydrogen Project Management
- 3.2.1. Necessity of Stakeholder Characterization
- 3.2.2. Stakeholder Classification
- 3.2.3. Stakeholder Management

3.3. Most Relevant Project Contracts in the Hydrogen Field
- 3.3.1. Classification of the Most Relevant Contracts
- 3.3.2. Contracting Process
- 3.3.3. Contract Content

3.4. Defining Objectives and Impacts for Projects in the Hydrogen Sector
- 3.4.1. Objectives
- 3.4.2. Impacts
- 3.4.3. Objectives vs. Impacts

3.5. Hydrogen Project Work Plan
- 3.5.1. Importance of the Work Plan
- 3.5.2. Elements that Constitute It
- 3.5.3. Development

3.6. Key Deliverables and Milestones in Hydrogen Sector Projects
- 3.6.1. Deliverables and Milestones. Definition of Customer Expectations
- 3.6.2. Deliverables
- 3.6.3. Milestones

3.7. Project Schedule in Hydrogen Sector Projects
- 3.7.1. Preliminary Steps
- 3.7.2. Definition of Activities. Time Window, PM Efforts and Relationship between Stages
- 3.7.3. Graphic Tools Available

3.8. Identification and Classification of Risks of Hydrogen Sector Projects
- 3.8.1. Creation of the Project Risk Plan
- 3.8.2. Risk Analysis
- 3.8.3. Importance of Project Risk Management

3.9. Analysis of the EPC Phase of a Hydrogen Type Project
- 3.9.1. Detailed Engineering
- 3.9.2. Purchasing and Supplies
- 3.9.3. Construction Phase

3:10. Analysis of the O&M Phase of a Hydrogen Type Project
- 3.10.1. Development of the Operation and Maintenance Plan
- 3.10.2. Maintenance Protocols. Importance of Preventive Maintenance
- 3.10.3. Management of the Operation and Maintenance Plan

Module 4. Technical-Economic and Feasibility Analysis of Hydrogen Projects

4.1. Green Hydrogen Power Supply
- 4.1.1. The Keys to PPAs (Power Purchase Agreement)
- 4.1.2. Self-Consumption with Green Hydrogen
- 4.1.3. Hydrogen production in off-grid configuration (*Offgrid*)

4.2. Technical and Economic Modeling of Electrolysis Plants
- 4.2.1. Definition of Production Plant Requirements
- 4.2.2. CAPEX (Capital Expenditure)
- 4.2.3. OPEX (Operational Expenditure)

4.3. Technical and Economic Modeling of Storage Facilities according to Formats (GH2, LH2, Green Ammonia, Methanol, LOHC)
- 4.3.1. Technical Assessment of Different Storage Facilities
- 4.3.2. Cost Analysis
- 4.3.3. Selection Criteria

4.4. Technical and Economic Modeling of Hydrogen Transportation, Distribution, and End-Use Assets
- 4.4.1. Transportation and Distribution Cost Assessment
- 4.4.2. Technical Limitations of Current Hydrogen Transportation and Distribution Methods
- 4.4.3. Selection Criteria

4.5. Structuring of Hydrogen Projects. Financing Alternatives
- 4.5.1. Keys to the Choice of Financing
- 4.5.2. Private Equity Financing
- 4.5.3. Public Funding

4.6. Identification and Characterization of Project Revenues and Costs
- 4.6.1. Revenues
- 4.6.2. Costs
- 4.6.3. Joint Assessment

4.7. Calculation of Cash Flows and Project Profitability Indicators (IRR, NPV, others)
- 4.7.1. Cash Flow
- 4.7.2. Profitability Indicators
- 4.7.3. Case Study

4.8. Feasibility Analysis and Scenarios
- 4.8.1. Scenario Design
- 4.8.2. Scenario Analysis
- 4.8.3. Scenario Analysis

4.9. Use Case based on Project Finance
- 4.9.1. Relevant Figures of the SPV (Special Purpose Vehicle)
- 4.9.2. Development Process
- 4.9.3. Conclusions

4:10. Assessment of Barriers to Project Feasibility and Future Prospects
- 4.10.1. Existing Barriers to Hydrogen Project Feasibility
- 4.10.2. Assessment of the Current Situation
- 4.10.3. Future Perspectives

You will be able to deepen in the application regulations and the safety of the installations to successfully contribute to the development of the hydrogen economy"

05

Methodology

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

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

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

Case Study to contextualize all content

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

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

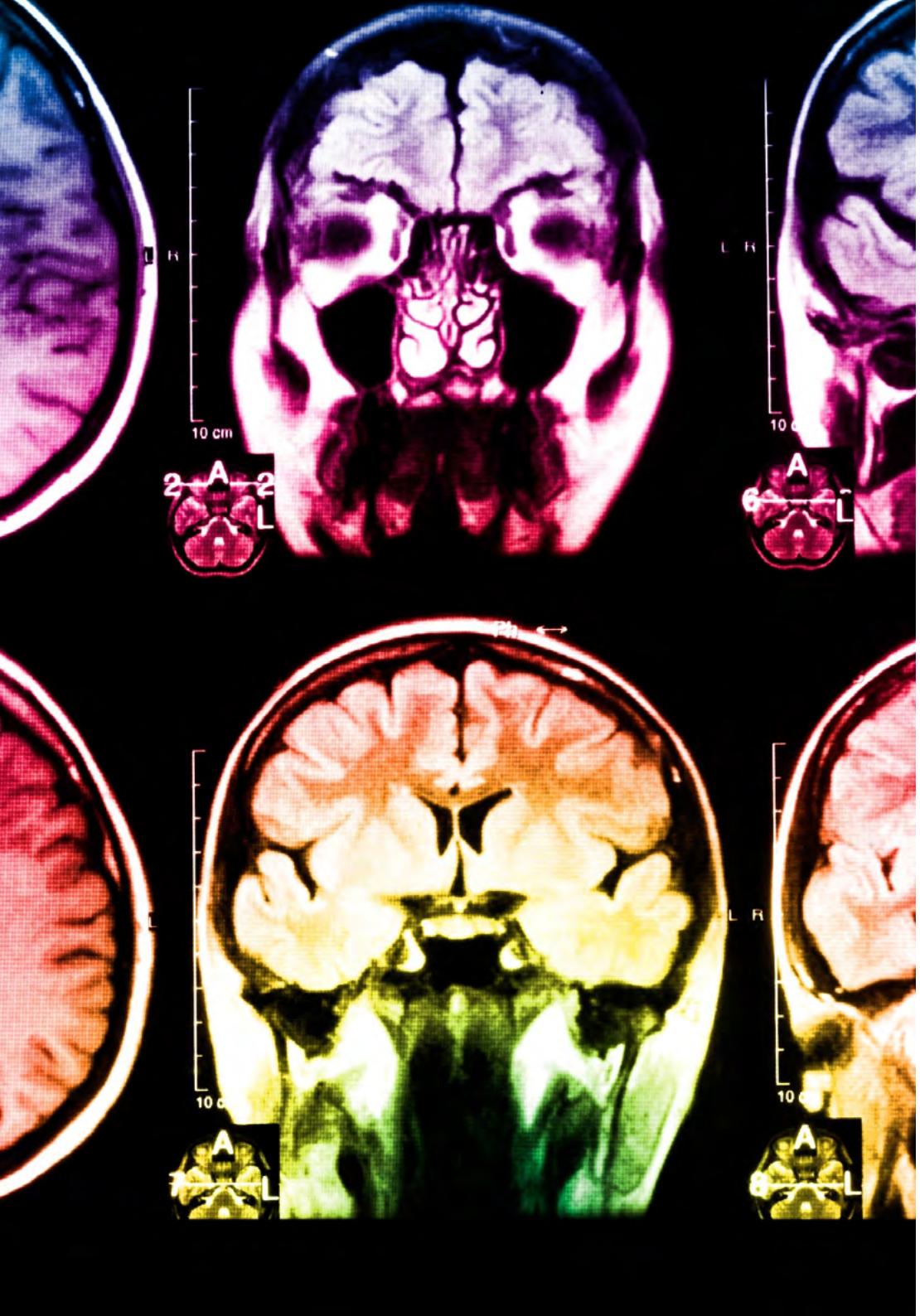
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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.

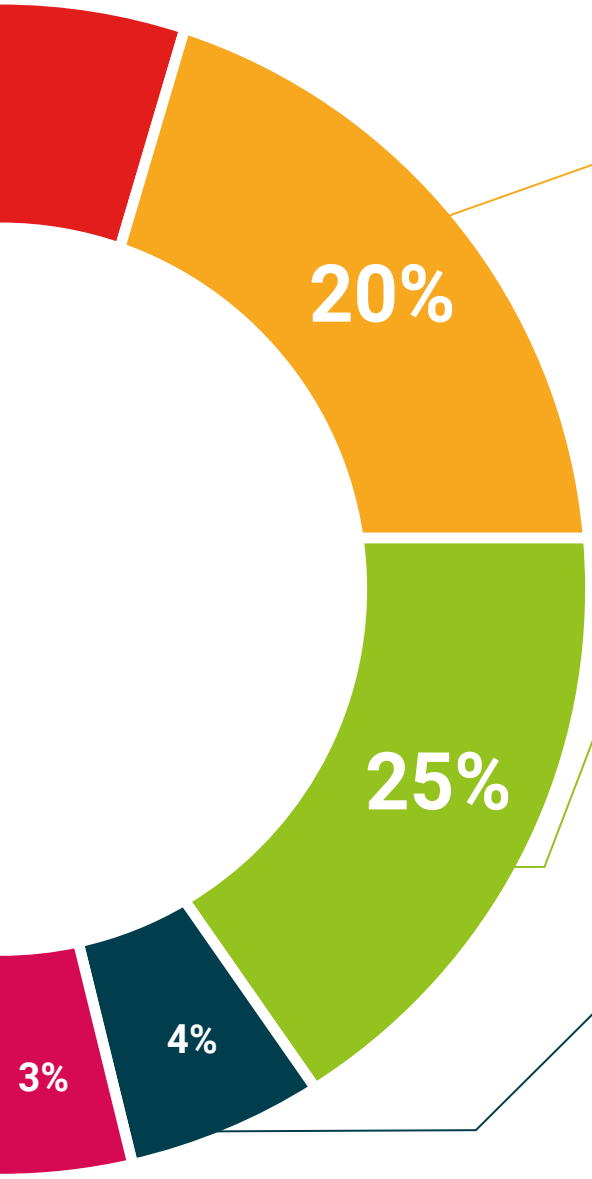
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

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 Diploma in Hydrogen Projects guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Global University.

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 Diploma in Hydrogen Projects** 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 Diploma in Hydrogen Projects**

Modality: **online**

Duration: **6 months**

Accreditation: **24 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Diploma in Hydrogen Projects

This is a program of 600 hours of duration equivalent to 24 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

*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.

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