Postgraduate Certificate

Alternative Fuels for Alternative Internal Combustion Engines

tech global university

tech global university

Postgraduate Certificate
Alternative Fuels for Alternative Internal Combustion Engines

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

Website: **www.techtitute.com/us/engineering/postgraduate-certificate/alternative-fuels-alternative-internal-combustion-engines**

Index

01

Introduction

Engines using different alternative fuels are an indispensable part of the automotive sector and other industrial areas. Their applications go beyond vehicles and are now closely linked to power generation. However, in order to take full advantage of these innovations, it is imperative to have a very high level of hands-on training. That's why TECH has a comprehensive university program that delves into fuel performance and its impact on the environment. In this way, graduates of this program will assimilate the main advances in the sector through a rigorous educational experience, from a complete interactive platform, without rigid schedules or evaluation chronograms. At the same time, it implements the disruptive Relearning system to boost the mastery of the most complex concepts.

With TECH you will take your engineering career to the top, achieving a solid position in the Alternative Fuels sector for MCIA"

In terms of accessibility, liquid fossil fuels are convenient, but they are not the only fuels that engines can use. Alternative fuels have been available at the same time that internal combustion engines came to dominate the industry. For example, wood gas was used during World War II, saving fuel needed for the entire war process. Today, not many vehicles run on wood gas, but a variety of alternative fuels are available.

In this way, studies in this field have progressed according to the development of new fuels in the industry, making it clear that engineering professionals must be up-to-date in this area of knowledge, which is constantly innovating. That is why this Postgraduate Certificate will provide the professional with knowledge in the deep and up-to-date understanding of the challenges, innovations and future perspectives in the field of engine research and development.

The graduates will strengthen their skills in specific areas related to the environmental regulations surrounding alternative fuels. On the other hand, it is a program that has a highly qualified and experienced teaching staff. It also integrates a prestigious and unique audiovisual content of the highest quality that offers a better experience to the professional due to its dynamism and convenience with the online modality.

For this reason, TECH emphasizes academic excellence and comfort, offering first class innovations with the highest standards, in this way being a program of great flexibility as it only requires an electronic device with an internet connection to access the Virtual Campus from the comfort of wherever you are.

This **Postgraduate Certificate in Alternative Fuels for Alternative Internal Combustion Engines** 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 Aeronautical Engineering
- 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 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

Incorporates the latest trends in alternative fuels through TECH's innovative Relearning methodology"

Analyze the most efficient electrical energy storage sources for MCIA throughout this intensive program"

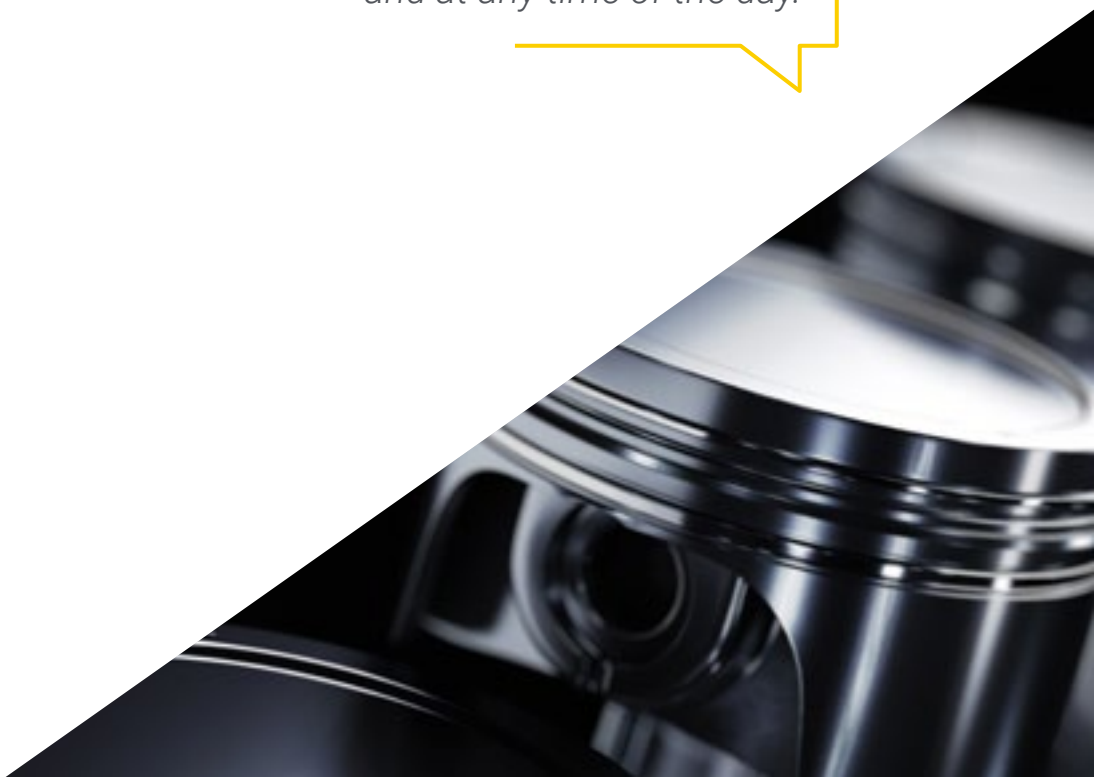
A program that integrates excellent high quality audiovisual content, which complements the knowledge acquired.

TECH guarantees the flexibility you are looking for, complete the study of this Postgraduate Certificate virtually and at any time of the day.

The program's teaching staff includes professionals from the 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 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 educational year. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

This Postgraduate Certificate will provide the professional with an intensive update on the main advances in Alternative Fuels. For this purpose, TECH has cutting-edge content and innovative teaching tools in the form of explanatory videos, interactive summaries, infographics and other materials in multimedia format. In this way, upon completion of this educational pathway, graduates will have the most advanced skills to make the most of the applications within the automotive industry.

TECH provides you with advanced content on Alternative Fuels to boost your career immediately"

General Objectives

- Analyze the state of the art of Alternative Internal Combustion Engines (AICE)
- Identify conventional Alternative Internal Combustion Engines, (AICEs)
- Examine the different aspects to be taken into account in the life cycle of AICEas
- Compile the fundamental principles of design, manufacture and simulation of reciprocating internal combustion engines
- Fundamentals of engine testing and validation techniques, including data interpretation and iteration between design and empirical results
- Determine the theoretical and practical aspects of engine design and manufacturing, promoting the ability to make informed decisions at each stage of the process
- Analyze the different injection and ignition methods in alternative internal combustion engines, specifying the advantages and challenges of each type of injection system in different applications
- Determine the natural vibration of internal combustion engines, modally analyzing their frequency and dynamic response, the impact on engine noise in normal and abnormal operation
- Study applicable vibration and noise reduction methods, international regulations and impact on transportation and industry
- Analyze how the latest technologies are redefining energy efficiency and reducing emissions in internal combustion vehicles
- Explore in depth Miller cycle engines, controlled compression ignition (HCCI), compression ignition (CCI) and other emerging concepts
- Analyze the technologies that enable compression ratio adjustment and their impact on efficiency and performance
- Fundamentals of integrating multiple approaches, such as the Atkinson-Miller cycle and spark controlled ignition (SCCI), to maximize efficiency under a variety of conditions
- Delve into the principles of engine data analysis
- Analyze the different alternative fuels on the market, their properties and characteristics, storage, distribution, emissions and energy balance
- Analyze the different systems and components of hybrid and electric motors
- Determine the energy control and management methods, their optimization criteria and their implementation in the transportation sector
- Fundamentals of an in-depth and up-to-date understanding of the challenges, innovations and future prospects in the field of engine research and development, with a focus on alternative internal combustion engines and their integration with advanced technologies and emerging propulsion systems

Specific Objectives

- Determine the different alternative fuels on the market
- Analyze the characteristics and properties of different alternative fuels
- Examine the forms of storage and distribution of each of the alternative fuels
- Evaluate alternative fuels performance and impact on emissions
- Identify the advantages and disadvantages of each based on their applicability
- Compile the environmental regulations surrounding alternative fuels
- Establish the economic and social impact of alternative fuels

Enroll in this program and you will be able to complete your educational and professional goals with the best online university in the world"

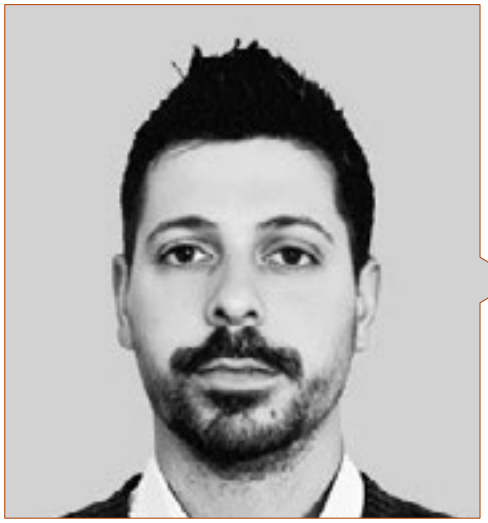
03

Course Management

The faculty of this TECH program is composed of true experts in aeronautical engineering, automotive engineering and industrial engine development. Their careers have been linked to projects related to machinery design, obtaining efficiency certifications and extending the useful life of different instruments. Through their theoretical and practical knowledge, they have developed a rigorous program where students will update their skills through intensive and personalized guidance.

With TECH you will have at your disposal the most specialized teaching staff in terms of innovation and implementation of Alternative Fuels"

Management



Mr. Del Pino Luengo, Isatsi

- Airbus Defence & Space Certification and Airworthiness Technical Manager
- Airbus Defence & Space CC295 FWSAR program certification and airworthiness technical manager
- Airworthiness and certification engineer for the engine section in charge of the MTR390 program at the National Institute for Aerospace Technology (NIAT)
- Airworthiness engineer and certification for the VSTOL section by the National Institute for Aerospace Technology (NIAT)
- Aeronautical design and certification engineer for the life extension project of the Spanish Navy AB212 helicopters (PEVH AB212) at Babcock MCSE
- Design and Certification Engineer in the DOA department at Babcock MCSE
- Fleet Technical Office Engineer AS 350 B3/ BELL 212/ SA 330 J.Babcock MCSE
- Qualifying Master's Degree in Aeronautical Engineering from the University of León
- Aeronautical Technical Engineer in Aeromotors, Polytechnic University of Madrid

Professors

Ms. Horcajada Rodríguez, Carmen

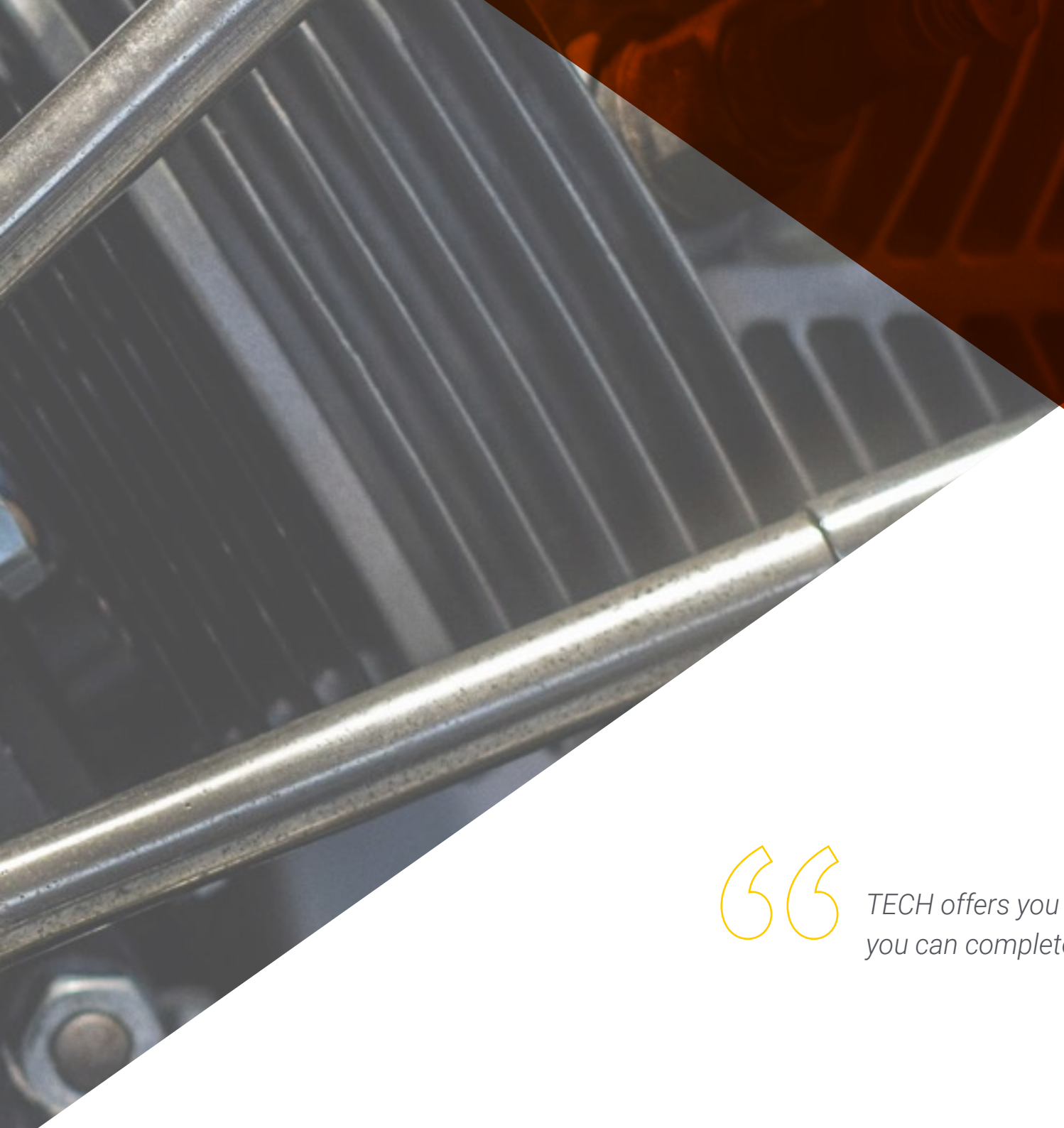
- Civil servant of the Ministry of Defense at the National Institute of Aerospace Technology (ISDEFE)
- Technical Assistant for ISDEFE
- Design and Certification Engineer for Sirium Aerotech
- Master's Degree in Integrated Quality, Environmental and Occupational Risk Prevention Management Systems
- Degree in Aerospace Engineering
- Specialization in Aerospace Vehicles by the Polytechnic University of Madrid

Take the step to get up to speed on the latest developments in Alternative Fuels for Alternative Internal Combustion Engines"

04

Structure and Content

This program contains the most recent research in the field of Alternative Fuels and Engineering, providing a syllabua that brings a great deal of academic volume on performance, emissions and energy balance. In addition, the Postgraduate Certificate is oriented to provide advanced theoretical and practical skills on the economic, environmental and socio-political impact of Alternative Combustion. To strengthen the mastery of these contents, the syllabus is supported by a variety of multimedia materials and a disruptive Relearning teaching methodology.



TECH offers you an exclusive study plan that you can complete in only 6 weeks"

Module 1. Alternative fuels and their impact on performance

1.1. Alternative Fuels
- 1.1.1. Conventional Fuels: Gasoline and Diesel
- 1.1.2. Alternative Fuels: Types
- 1.1.3. Alternative Fuels Comparison and Parameters

1.2. Biocarburants: Biodiesel, Bioethanol, Biogas, Bioethanol
- 1.2.1. Obtaining Biofuels Properties
- 1.2.2. Storage and Distribution: International Regulations
- 1.2.3. Performance, Emissions and Energy Balance
- 1.2.4. Applicability in Transportation and Industry

1.3. G Fuels. Natural Gas, Liquefied Gas, Compressed Gas
- 1.3.1. Obtaining Gas Fuels Properties
- 1.3.2. Storage and Distribution: International Regulations
- 1.3.3. Performance, Emissions and Energy Balance
- 1.3.4. Applicability in Transportation and Industry

1.4. Electricity as a Fuel Source
- 1.4.1. Obtaining Electricity and Batteries Properties
- 1.4.2. Storage and Distribution: International Regulations
- 1.4.3. Performance, Emissions and Energy Balance
- 1.4.4. Applicability in Transportation and Industry

1.5. Hydrogen as a Fuel Source: Fuel Cells and Internal Combustion Vehicles
- 1.5.1. Hydrogen Production and Fuel Cells Properties of Hydrogen as a Energy Source
- 1.5.2. Storage and Distribution: International Regulations
- 1.5.3. Performance, Emissions and Energy Balance
- 1.5.4. Applicability in Transportation and Industry

1.6. Synthetic Fuels
- 1.6.1. Obtaining Synthetic or Neutral Fuels Properties
- 1.6.2. Storage and Distribution: International Regulations
- 1.6.3. Performance, Emissions and Energy Balance
- 1.6.4. Applicability in Transportation and Industry

1.7. Next Generation Fuels
- 1.7.1. Properties of Second Generation Fuels
- 1.7.2. Storage and Distribution: Regulations
- 1.7.3. Performance, Emissions and Energy Balance
- 1.7.4. Applicability in Transportation and Industry

1.8. Performance and Emissions Evaluation with Alternative Fuels
- 1.8.1. Performance of Different Alternative Fuels
- 1.8.2. Performance Comparison
- 1.8.3. Emissions from Different Alternative Fuels
- 1.8.4. Emissions Comparison

1.9. Practical Application Short-, Medium- and Long-Haul Performance and Emissions Analysis
- 1.9.1. Alternative Fuels and Environmental Regulations
- 1.9.2. Evolution of International Environmental Regulations
- 1.9.3. International Regulations in the Transportation Sector
- 1.9.4. International Regulations in the Industrial Sector

1.10. economic and Social Impact of Alternative Fuels
- 1.10.1. Energy and Technology Resources
- 1.10.2. Market Availability of Alternatives Fuels
- 1.10.3. Economic, Environmental and Socio-Political Impact

Don't miss the opportunity and complete your training on Alternative Fuels through TECH's innovative Relearning system"

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.

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.

"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.

> *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.

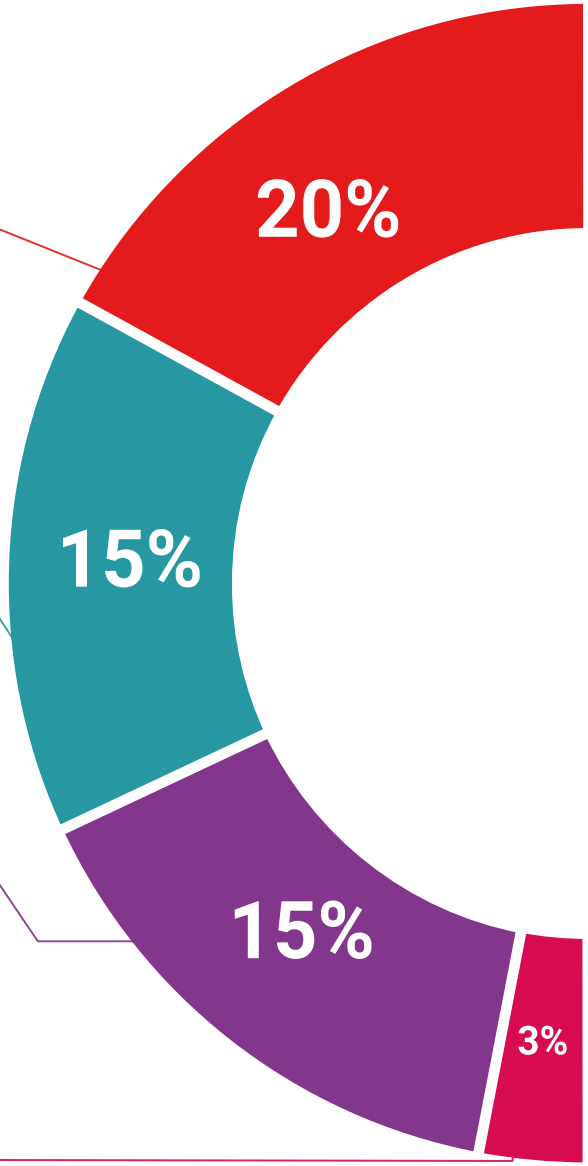
Interactive Summaries

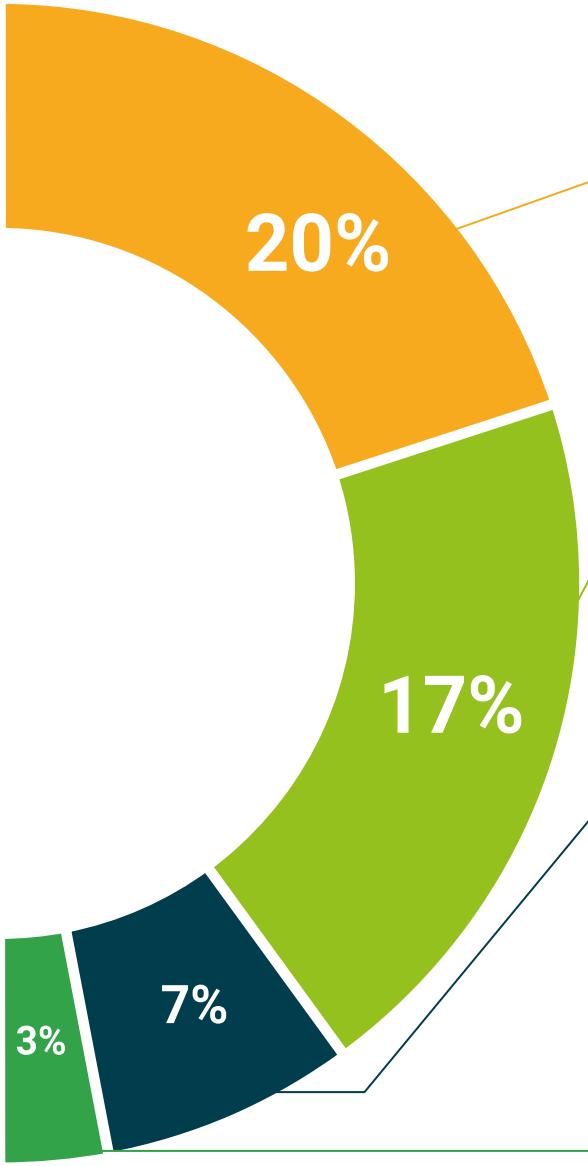
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

Certificate

The Postgraduate Certificate in Alternative Fuels for Alternative Internal Combustion Engines guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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 **Postgraduate Certificate in Alternative Fuels for Alternative Internal Combustion Engines** 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 Alternative Fuels for Alternative Internal Combustion Engines**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

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

Postgraduate Certificate in Alternative Fuels for Alternative Internal Combustion Engines

This is a private qualification of 180 hours of duration equivalent to 6 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
Dean

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.

tech global university

Postgraduate Certificate

Alternative Fuels for Alternative Internal Combustion Engines

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

Postgraduate Certificate

Alternative Fuels for Alternative Internal Combustion Engines

tech global university