

Postgraduate Certificate

Alternative Fuels for Alternative Internal Combustion Engines



Postgraduate Certificate

Alternative Fuels for Alternative Internal Combustion Engines

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

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

Index

01

Introduction

p. 4

02

Objectives

p. 8

03

Course Management

p. 12

04

Structure and Content

p. 16

05

Methodology

p. 20

06

Certificate

p. 28

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 MCI through this intensive program”

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.

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.



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 AICEs
- ♦ 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. Calatayud Sánchez, Rosa

- ◆ Type certificate Manager of the M&L fleet at Airbus DS
- ◆ Management of Certification activities with ADS areas and Authorities at Airbus DS
- ◆ Altran Innovation on behalf of Airbus DS for M&L programs Initial military version certification (FAR 25)
- ◆ Forming certification bases and type certificates for Airbus DS
- ◆ Certification and airworthiness trainer under Canadian TAA authority for Airbus DS
- ◆ Aeronautical Engineer, specializing in Aircraft and Airports, Polytechnic University of Valencia
- ◆ MBA in Tago Academy



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 syllabus 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

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 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 Technological University.



“

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork”

This **Postgraduate Certificate in Alternative Fuels for Alternative Internal Combustion Engines** contains the most complete and up-to-date educational program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

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

Official N° of Hours: **150 hours**.



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



Postgraduate Certificate Alternative Fuels for Alternative Internal Combustion Engines

- » Modality: **online**
- » Duration: **6 weeks**
- » Certificate: **TECH Technological University**
- » Dedication: **16h/week**
- » Schedule: **at your own pace**
- » Exams: **online**

Postgraduate Certificate

Alternative Fuels for Alternative Internal Combustion Engines