Postgraduate Certificate

Hybrid Engines and Extended Range Electric Vehicles

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Postgraduate Certificate

Hybrid Engines and Extended Range Electric Vehicles

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

Website: **www.techtitute.com/in/engineering/postgraduate-certificate/hybrid-engines-extended-range-electric-vehicles**

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01

Introduction

The automotive industry has focused on reducing emissions, gradually implementing a reduction in the use of internal combustion engine vehicles. These cars have been a revolution in the industry, since their propulsion technology is mainly provided by an electric unit and in some cases, up to two units are used for this purpose. In accordance with the relevance that this field of study has taken, this program has been created, offering advanced content in the optimization criteria of hybrid and electric motors. All this taught in a convenient online teaching format and with a team of teachers experienced in Alternative Internal Combustion Engines.

Thanks to this program you will contribute to the sustainability of the planet by providing innovative solutions to the integral urban water cycle"

The worldwide increase in electromobility has led to important innovations in the development of new types of automobiles. One such type is the so-called EREV or extended range electric vehicle. In this way, the way forward for the automotive industries is clear, to be more environmentally friendly. Accordingly, professionals have worked on the evolution of this area of knowledge by implementing hybrid engines and hybrid system architectures, as well as electric motors and energy storage technologies.

In this way, research in this sector has advanced to answer multiple questions, making it clear that engineering professionals must be at the forefront in this area of knowledge, which is innovating and advancing with the passing of time. In this way, this Postgraduate Certificate will provide the professional with updates in energy management and power distribution in hybrid systems and in efficiency measurement methods in electric vehicles.

The engineers will strengthen their competencies in specific areas related to the development of the parameters and challenges of electric and hybrid motor design. On the other hand, it is a program that integrates a highly specialized and experienced teacher team, supported by audiovisual content of the highest quality that offers a greater dynamic to the students due to its flexibility and convenience with the online modality.

In its commitment to online educational excellence, TECH has made available to its students an cutting-edge and complete program that will train students completely online. In this way, you will have access to the best audiovisual content in the current educational panorama, requiring only a device with an Internet connection to access the virtual platform from the comfort of wherever you are.

This **Postgraduate Certificate in Hybrid Engines and Extended Range Electric Vehicles** 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 eminently practical contents of the book provide scientific 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, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an Internet connection

At TECH you will continue to expand your knowledge and you will be able to answer questions in disciplines such as Alternative Internal Combustion"

You will have access to unique materials and multimedia content to achieve your goals, providing you with dynamism and comfort with the Relearning methodology"

Gain more knowledge and become an expert engineer in Hybrid Engines and Extended Range Electric Vehicles.

TECH is excellence and efficiency, offering you innovative tools and the most current content of the educational program.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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 program on Hybrid Engines and Extended Range Electric Vehicles has been developed exclusively to offer the professional the most recent updates in the field of alternative internal combustion. Therefore, TECH provides several innovative teaching tools, guaranteeing the success of the educational process of the program. At the end of this program, the students will have nurtured their knowledge in the delve of advanced design concepts and principles applied to engineering.

TECH is on the cutting edge, providing you with advanced industry content to meet your career goals in less time than you think"

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

- Identify the types of hybrid and electric motors
- Develop the parameters and challenges of electric and hybrid motor design
- Establish optimization criteria for hybrid and electric motors
- Analyze energy recovery systems
- Identify the fundamental aspects of the loading infrastructure

Give your career the boost it needs and specialize with the exclusive program in Hybrid Engines and Extended Range Electric Vehicles that TECH makes available to you"

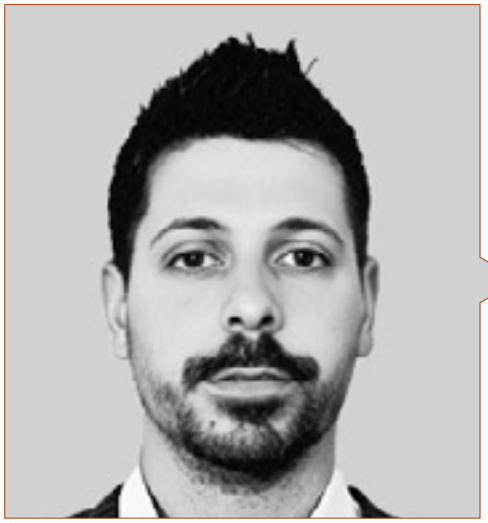
03

Course Management

The students will have access to content created by a faculty specialized in aeronautical design and certification in the helicopter life extension project, aeronautical engineering in aeromotors, management of certification activities with the ADS areas and authorities at Airbus DS and testing and design engineering and certification at Avincis Aviation Technics. Their vast experience and solid knowledge will allow the graduate to resolve doubts and answer questions that may arise during the course of the program.

The content to which you will have access was designed by professionals specialized in Energy Management Strategies"

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

Mr. Mariner Bonet, Iñaki

- Head of Flight Test Office at Avincis Aviation Technics
- Design, Certification and Test Engineer at Avincis Aviation Technics
- Calculation and materials engineer at the Aragon Institute of Technology
- Calculus Engineer at the Polytechnic University of Valencia
- Master in Flight Test and Aircraft Certification (EASA cat 2) by the Polytechnic University of Madrid
- Aeronautical Engineer from the Polytechnic University of Valencia

04

Structure and Content

To develop the syllabus for this program, TECH has selected a team of Alternative Internal Combustion Engine Experts who have developed a cutting-edge and unique syllabus. In this way, through 6 weeks of intensive training, the engineer will delve into energy recovery systems and delve into electric motor components. All this under the most efficient pedagogical methodology, TECH Relearning.

A syllabus designed by and for experts with the most cutting-edge advances in Hybrid Engines and Extended Range Electric Vehicles"

Module 1. Hybrid engines and extended-range electric vehicles

1.1. Hybrid Engines and Hybrid System Architectures
- 1.1.1. Hybrid Engines
- 1.1.2. Energy Recovery Systems
- 1.1.3. Hybrid Engines Types

1.2. Electric motors and Energy Storage Technologies
- 1.2.1. Electric Motors
- 1.2.2. Components of Electric Motors
- 1.2.3. Energy Storage Systems

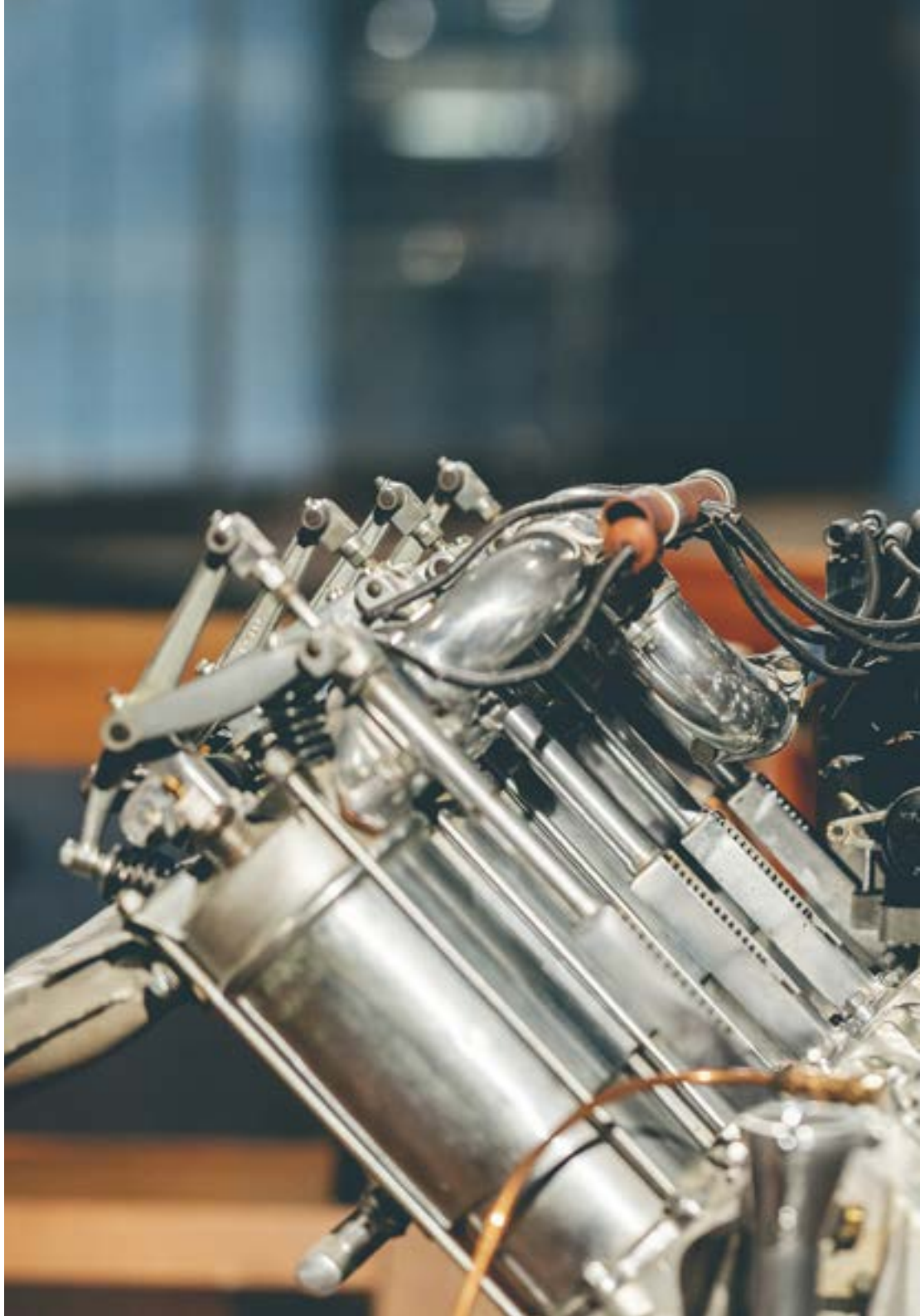
1.3. Hybrid Vehicle Design and Development
- 1.3.1. Component Sizing
- 1.3.2. Energy Management Strategies
- 1.3.3. Useful Life of the Components

1.4. Control and Management of Hybrid Propulsion Systems
- 1.4.1. Energy Management and Power Distribution in Hybrid Systems
- 1.4.2. Transition Strategies between Operating Modes
- 1.4.3. Optimization of Operations for Maximum Efficiency

1.5. Hybrid Vehicle Assessment and Validation
- 1.5.1. Hybrid Vehicle Efficiency Measurement Methods
- 1.5.2. Emissions Testing and Compliance
- 1.5.3. Market Trends

1.6. Electrical Vehicle Design and Development
- 1.6.1. Component Sizing
- 1.6.2. Energy Management Strategies
- 1.6.3. Useful Life of the Components

1.7. Electric Vehicle Assessment and Validation
- 1.7.1. Electric Vehicle Efficiency Measurement Methods
- 1.7.2. Emissions Testing and International Regulatory Compliance
- 1.7.3. Market Trends



1.8. Electric Vehicles and its Impact on Society
- 1.8.1. Electric Vehicles and Technological Evolution
- 1.8.2. Electric Vehicles in Industry
- 1.8.3. Collective Transportation

1.9. Charging Infrastructure and Fast Charging Systems
- 1.9.1. Recharging Systems
- 1.9.2. Recharge Connectors
- 1.9.3. Residential and Commercial Load
- 1.9.4. Public and Fast Charging Networks

1.10. Cost-Benefit Analysis of Hybrid and Electric Systems
- 1.10.1. Economic Evaluation of the Implementation of Hybrid and Extended Range Electric Systems
- 1.10.2. Manufacturing, Maintenance and Operating Cost Analysis
- 1.10.3. Life Cycle Analysis Amortizations

A 100% online program that provides flexibility and convenience to delve into Electric Vehicles and Technology Evolution at your convenience"

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

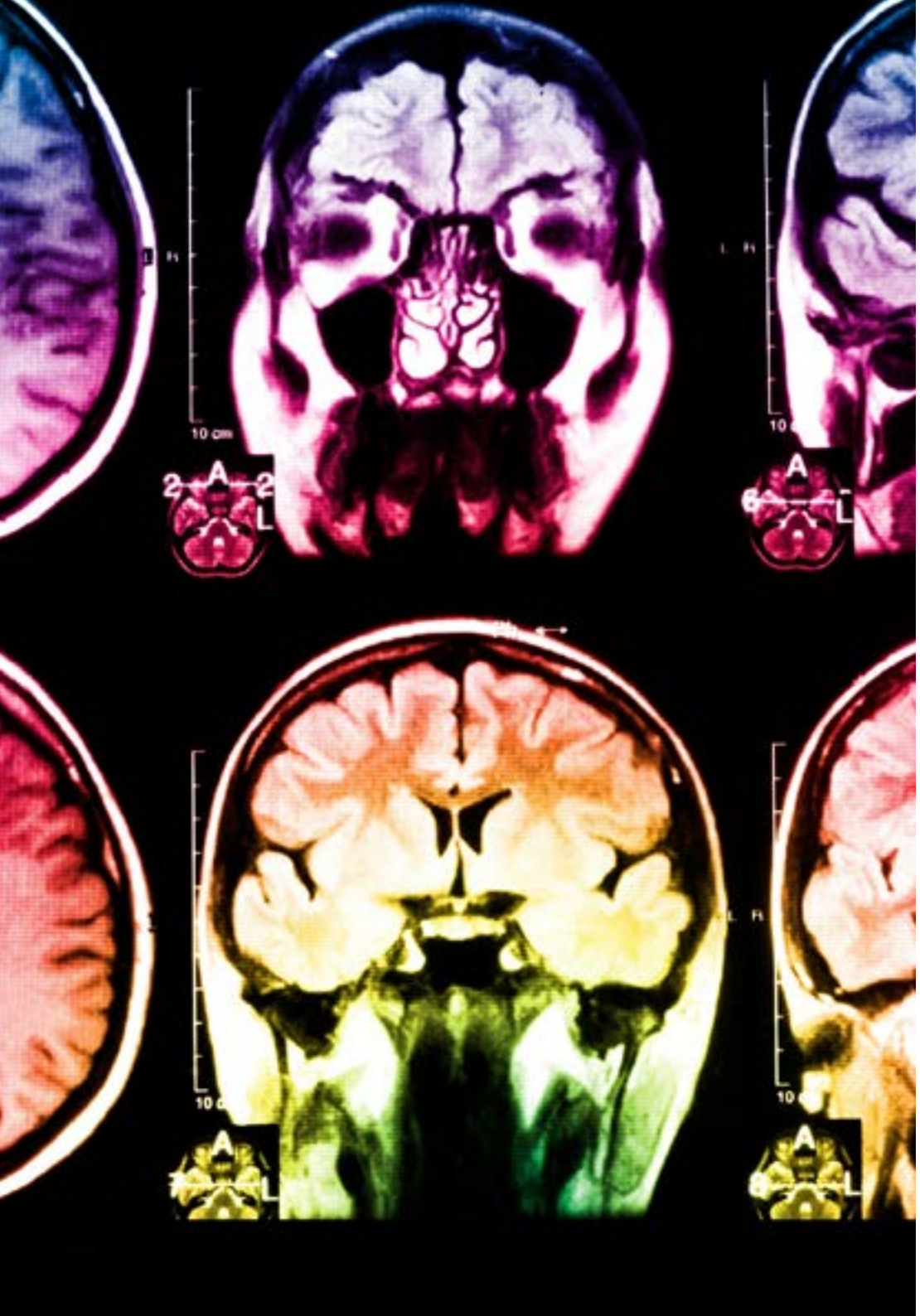
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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.

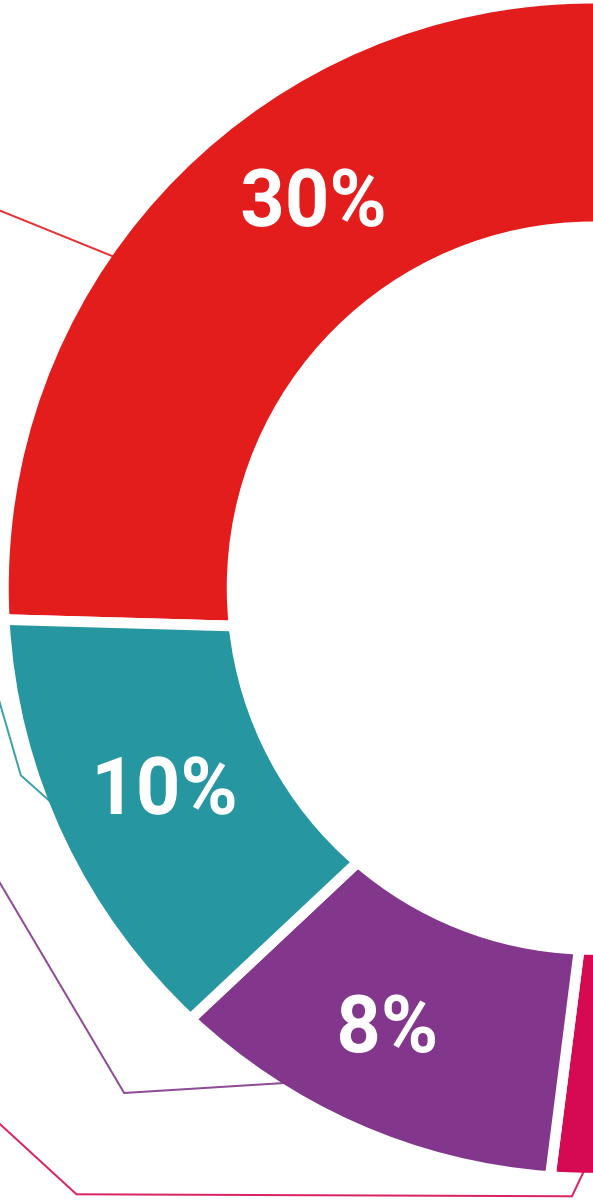
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

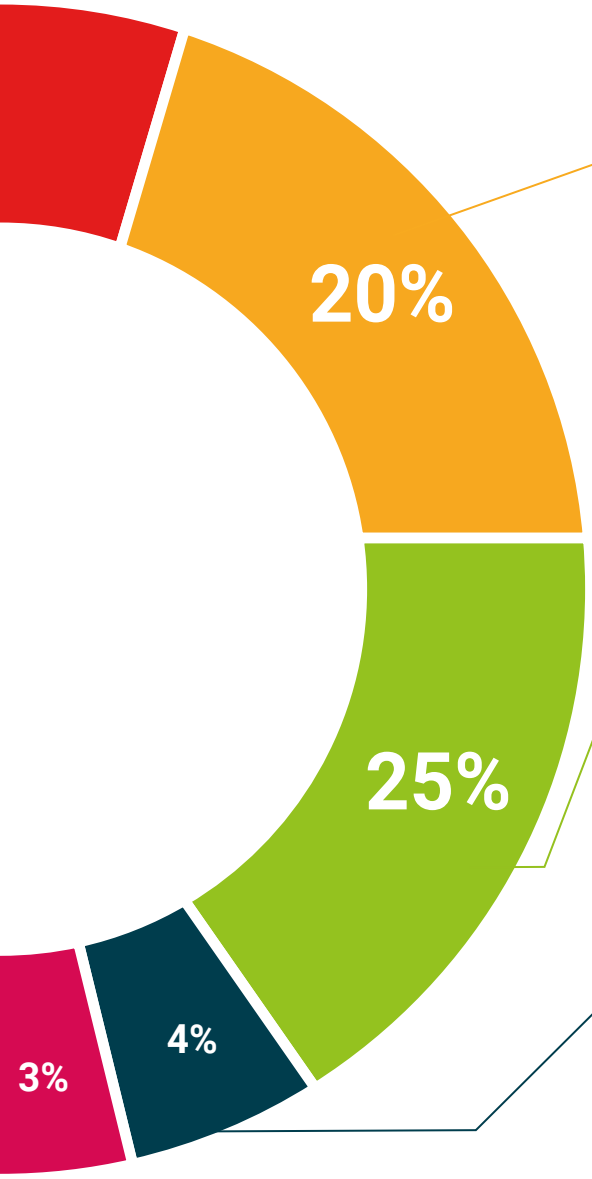
Practising Skills and Abilities

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 Hybrid Engines and Extended Range Electric Vehicles 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 Hybrid Engines and Extended Range Electric Vehicles** contains the most complete and up-to-date 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 certificate 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 Hybrid Engines and Extended Range Electric Vehicles**

Official Nº of Hours: **150 hours.**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Awards the followi ng

CERTIFICATE

to

Mr./Ms. _____, with identification number _____ .

For having passed and accredited the following progra m

POSTGRADUATE CERTIFICATE

in

Hybrid Engines and Extended Range Electric Vehicles

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy .

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

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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 EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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Postgraduate Certificate

Hybrid Engines and Extended Range Electric Vehicles

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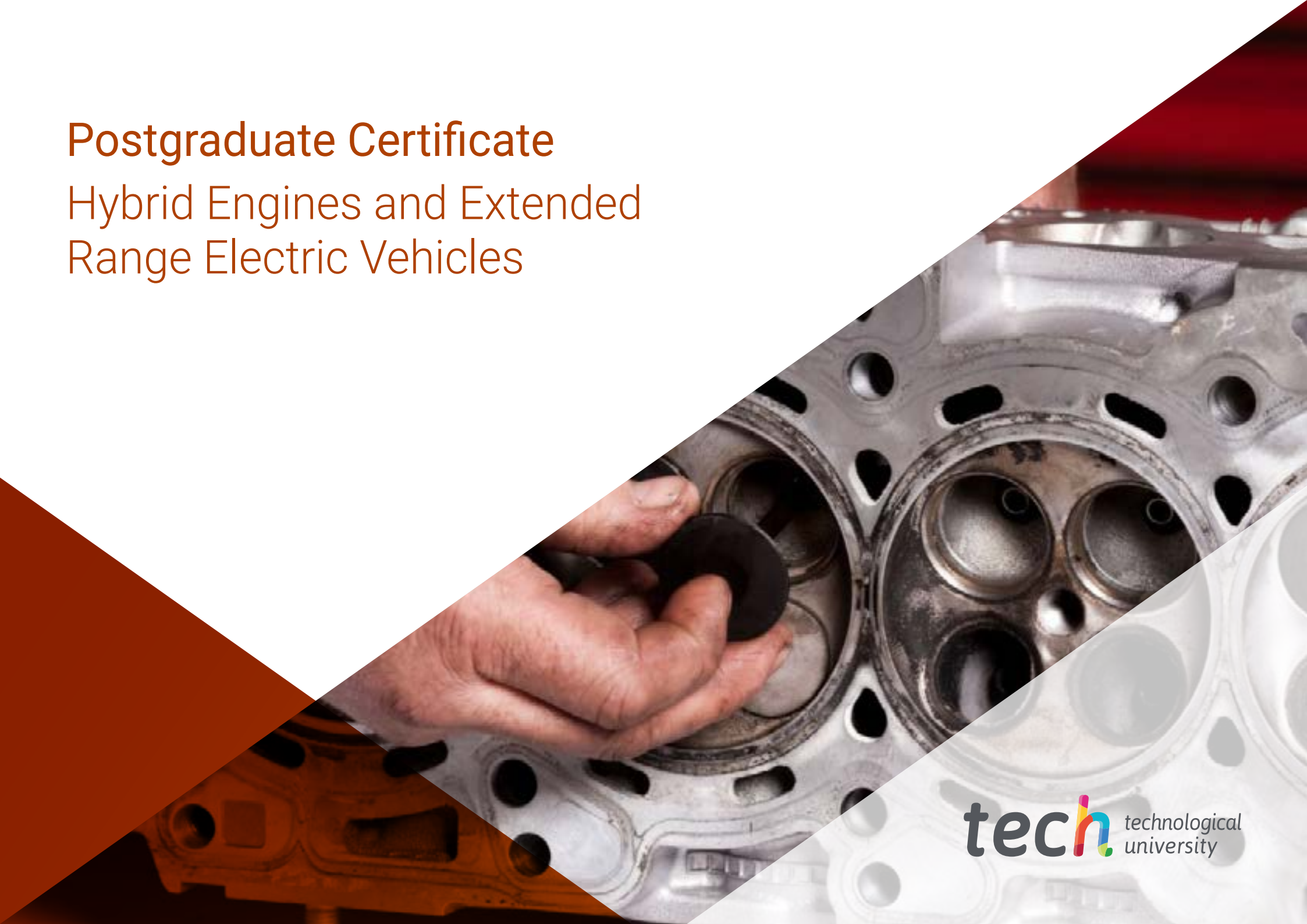

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