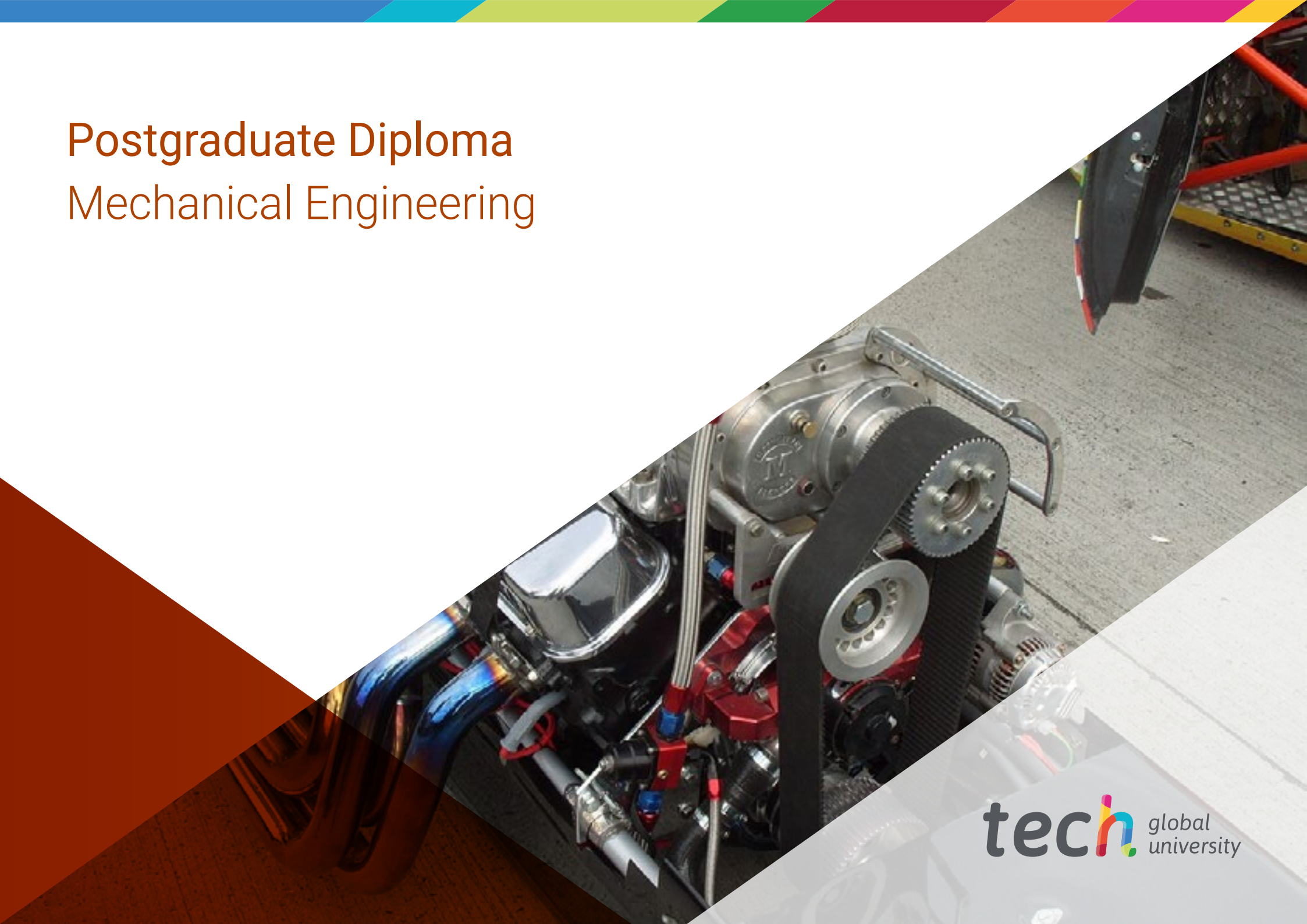
Postgraduate Diploma
Mechanical Engineering



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Postgraduate Diploma
Mechanical Engineering

- 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/postgraduate-diploma/postgraduate-diploma-mechanical-engineering**

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01

Introduction

With this intensive training you will learn the main aspects of project management in the field of mechanical engineering, starting with an in-depth knowledge of the design process, the process of research and innovation of technical solutions, to which special importance is given, as well as the modeling and simulation of the different solutions.

A unique opportunity to specialise and stand out in a high-demand professional field.

Learn to design, evaluate and manage mechanical engineering projects thanks to this high-level training

Mechanical engineering has been supported in recent years by new technologies, so professionals in this sector must have extensive digital skills"

TECH's Postgraduate Diploma in Mechanical Engineering is a program designed specifically for professionals who need to strengthen their knowledge of both the conventional aspects of their professional activity and the most innovative aspects.

It has an international focus, with content based on that of the most prestigious universities in the world and is aligned with the recommendations of professional associations such as ASME (American Society of Mechanical Engineers) and IMechE (Institution of Mechanical Engineers).

The use of the case method facilitates the learning of concepts by avoiding systematic memorization and repetitive performance of complex calculations.

The content of the Postgraduate Diploma combines the traditional, but necessary, aspects of the profession with the most innovative aspects, which are renewed in each edition.

With this prestigious bring, students will learn to effectively face the challenges of the mechanical engineering profession by mastering all aspects of mechanics and gaining in-depth knowledge of innovation management and continuous improvement processes.

This Postgraduate Diploma provides the necessary foundations to maintain an attitude of active observation of innovation, which allows professionals to remain updated and maintain a capacity to adapt to technological changes.

As it is an 100% online specialisation, the student is not bound by fixed schedules or the need to move to another physical location, rather, they can access the content at any time of the day, balancing their professional or personal life with their academic life.

This **Postgraduate Diploma in Mechanical Engineering** is the most comprehensive and up-to-date educational program on the market. The most outstanding characteristics of the program are:

- The development of case studies presented by experts in Engineering Mechanisms.
- The graphic, schematic, and eminently 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.
- Special emphasis on innovative methodologies in Engineering Mechanisms.
- 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.

The completion of this Postgraduate Diploma will place Mechanical Engineering professionals at the forefront of the latest developments in the sector"

This Postgraduate Diploma is the best investment you can make in selecting an updated program in the field of Engineering Mechanisms. We offer you quality and free access to content"

This program comes with the best didactic material, providing you with a contextual approach that will facilitate your learning

This 100% online Postgraduate Diploma will allow you to combine your studies with your professional work. You choose where and when to study

The teaching staff includes professionals from the engineering sector, who bring their experience to this program program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide professionals with situated and contextual learning, i.e., a simulated environment that will provide immersive program, designed for training oneself 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 academic year. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced engineering experts.

02

Objectives

The **Postgraduate Diploma in Mechanical Engineering** is aimed at facilitating the performance of the professional to acquire and know the main developments in this field, which will allow him to practice his profession with the highest quality and professionalism.

Our goal is to make you the best professional in your sector. And for this we have the best methodology and content"

General Objectives

- Provide scientific and technological training for the professional practice of Mechanical Engineering
- Gain complex knowledge of engineering project management and continuous process improvement
- Gain complex knowledge of the design of machine elements, engines, structures and installations, including the choice of materials, their method of manufacture and reliability, safety and environmental considerations
- Delve into the necessary knowledge of Industry 4.0 applied to Mechanical Engineering
- Delve into the necessary knowledge of advanced and innovative applications of Mechanical Engineering

Join us and we will help you achieve professional excellence"

Specific Objectives

Module 1. Project Management in Mechanical Engineering

- Master all aspects of Mechanical Engineering design
- Manage projects following the steps accepted by international standards
- Evaluate the different failure theories for their application to each machine element
- Analyze the regulations required to carry out engineering projects

Module 2. Thermal, Hydraulic and Pneumatic Machines

- Master the principles of thermodynamics necessary for the development of machines
- Create heat transfer systems capable of delivering energy
- Analyze and evaluate different combustion processes
- Design hydraulic and hydrostatic systems, capable of generating, transmitting and storing energy
- Design pneumatic systems capable of transmitting and storing energy

Module 3. Advanced Dynamics

- Master the aspects of advanced machine dynamics
- Analyze and evaluate vibration and resonance phenomena in machine elements and structures
- Analyze and evaluate the dynamic behavior of vehicles
- Analyze and evaluate the dynamic behavior of electromechanical microsystems
- Analyze and evaluate the dynamic behavior of robots
- Analyze and evaluate the dynamic behavior of humans and other living beings
- Design mechanical solutions inspired by living organisms

Module 4. Design for Manufacturing

- Design machine elements with optimized manufacturing and assembly processes
- Analyze and evaluate different mold forming processes
- Analyze and evaluate different plastic deformation forming processes
- Analyze and evaluate different material loss forming processes
- Analyze and evaluate the different heat treatments on machine elements
- Analyze and evaluate paint and coating application systems
- Analyze and evaluate the forming processes of polymers and ceramic materials
- Analyze and evaluate the manufacturing processes of complex materials
- Analyze and evaluate the different additive manufacturing processes
- Create, analyze and evaluate robust manufacturing processes to ensure the quality of the finished product

03

Course Management

In our university we have professionals specialized in each area of knowledge, who pour into our training the experience of their work.

Our university employs the best professionals from different areas, who pour their knowledge into the elaboration of this complete program"

Management

Mr. Asiain Sastre, Jorge

- Industrial Technical Engineer - Mechanics. University of Salamanca.
- Director and Co-Founder of AlterEvo Ltd. Professor of Mechanical Engineering
- Chartered Engineer member of Institution of Mechanical Engineers (CEng MIMechE)
- Master's Degree in Automotive Engineering
- MBA

Professors

Mr. Berdún Barbero, Daniel

- Industrial Engineering. School of Industrial Engineering
- Technical Office Manager at INSTER

Mr . De Lama Burgos, Carlos

- Technical Advisor at the Association of Industrial Technical Engineers of Madrid.
- Technical and legal advice in the field of industrial engineering
- Industrial Safety
- Professor at the School of Architecture, Engineering and Design of the Universidad Europa de Madrid.

Mr. Iglesias Alonso, Luis

- Certification Engineer in charge of Electrical Safety, Batteries and Electromagnetic Compatibility at SCANIA
- Vice President of the Technical Commission of Production and Launching of New Products, in the Spanish Association of Automotive Professionals (ASEPA)
- Foundation of Eleanor Homologaciones. Currently performing supervisory duties

Mr. Panero, David

- Mechanical Engineer in Mechanical Design Department, HoribaAutomotive Test Systems, Madrid, Spain
- Double Master's Degree in Mechatronics Engineering and Industrial Technology Engineering

Mr. Prieto Díaz, Beatriz

- Mechanical Engineer at Riegos y Electricidad Salamanca, SL
- Degree in Mechanical Engineering. University of Salamanca.
- Master's Degree in Industrial Mechanics. Carlos III University of Madrid

Get trained at the world's leading private Spanish-speaking online university"

04

Structure and Content

The structure of the contents has been designed by the best professionals in the Mechanical Engineering sector, with extensive experience and recognized prestige in the profession, and aware of the benefits that the latest educational technology can bring to higher education.

We have the most complete and up-to-date academic program in the market. We strive for excellence and for you to achieve it too"

Module 1. Project Management in Mechanical Engineering

1.1. Design Process
1.2. Research and Innovation
  1.2.1. Technological Creativity
  1.2.2. Fundamentals of Design Thinking
1.3. Modeling and Simulation
  1.3.1. 3D Design
  1.3.2. BIM Methodology
  1.3.3. Finite Elements
  1.3.4. 3D Printing
1.4. Project Management
  1.4.1. Start
  1.4.2. Planning
  1.4.3. Implementation
  1.4.4. Control
  1.4.5. Closure
1.5. Problem Solving
  1.5.1. 8D Methodology
1.6. Leadership and Conflict Resolution
1.7. Organization and Communication
1.8. Project Drafting
1.9. Regulations
1.10. Intellectual Property
  1.10.1. Patents
  1.10.2. Utility Models
  1.10.3. Industrial Design

Module 2. Thermal, Hydraulic and Pneumatic Machines

2.1. Principles of Thermodynamics
2.2. Heat Transfer
2.3. Thermodynamic Cycles
  2.3.1. Steam Cycles
  2.3.2. Air Cycles
  2.3.3. Refrigeration Cycles
2.4. Combustion Processes
2.5. Thermal Machines
  2.5.1. Steam Turbine
  2.5.2. Combustion Engines
  2.5.3. Gas Turbines
  2.5.4. Stirling Engine
2.6. Fluid Mechanics
  2.6.1. Multidimensional Fluid Mechanics
  2.6.2. Laminar Flow
  2.6.3. Turbulent Flow
2.7. Hydraulic Systems and Hydrostatics
  2.7.1. Distribution Networks
  2.7.2. Hydraulic System Elements
  2.7.3. Cavitation and Water Hammer
2.8. Hydraulic Machines
  2.8.1. Positive Displacement Pumps
  2.8.2. Rotary Pumps
  2.8.3. Cavitation
  2.8.4. Coupling of Hydraulic Installations
2.9. Turbomachines
  2.9.1. Action Turbines
  2.9.2. Reaction Turbines

2.10. Pneumatics
- 2.10.1. Compressed Air Production
- 2.10.2. Compressed Air Preparation
- 2.10.3. Elements of a Pneumatic System
- 2.10.4. Vacuum Generators
- 2.10.5. Actuators

Module 3. Advanced Dynamics

3.1. Advanced Machine Dynamics
3.2. Vibrations and Resonance
3.3. Longitudinal Vehicle Dynamics
- 3.3.1. Vehicle Performance
- 3.3.2. Vehicle Braking

3.4. Transverse Vehicle Dynamics
- 3.4.1. Steering Geometry
- 3.4.2. Circulation in Curves

3.5. Railroad Dynamics
- 3.5.1. Traction Efforts
- 3.5.2. Braking Efforts

3.6. Dynamics of Mechanical Microsystems
3.7. Robot Kinematics
- 3.7.1. Direct Kinematic Problem
- 3.7.2. Inverse Kinematic Problem

3.8. Robot Dynamics
3.9. Biomimicry
3.10. Dynamics of Human Movement

Module 4. Design for Manufacturing

4.1. Design for Manufacturing and Assembly
4.2. Forming by Molding
- 4.2.1. Casting
- 4.2.2. Injection Molding

4.3. Forming by Deformation
- 4.3.1. Plastic Deformation
- 4.3.2. Stamping
- 4.3.3. Forging
- 4.3.4. Extrusion

4.4. Forming by Material Removal
- 4.4.1. Abrasive Loss
- 4.4.2. Chip Removal

4.5. Heat Treatment
- 4.5.1. Hardening
- 4.5.2. Tempering
- 4.5.3. Annealing
- 4.5.4. Normalizing
- 4.5.5. Thermochemical Treatments

4.6. Application of Paints and Coatings
- 4.6.1. Electrochemical Treatments
- 4.6.2. Electrolytic Treatments
- 4.6.3. Paints, Lacquers and Varnishes

4.7. Polymer and Ceramic Material Forming
4.8. Composite Material Part Manufacturing
4.9. Additive Manufacturing
- 4.9.1. Powder Bed Fusion
- 4.9.2. *Direct Energy Deposition*
- 4.9.3. *Binder Jetting*
- 4.9.4. *Bound Powder Extrusion*

4.10. Robust Engineering
- 4.10.1. Taguchi Method
- 4.10.2. Design of Experiments
- 4.10.3. Statistical Process Control

05

Methodology

This training provides you with a different way of learning. Our methodology uses a cyclical learning approach: ***Re-learning***.

This teaching system is used 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 Re-learning, 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"

At TECH we use the Case Method

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

With TECH you can experience a way of learning that is shaking the foundations of traditional universities around the world"

We are the first online university to combine Harvard Business School case studies with a 100% online learning system based on repetition

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

A learning method that is different and innovative.

This Engineering program at TECH is an intensive program that prepares you to face all the challenges in this area, both nationally and internationally. We are committed to promoting your personal and professional growth, the best way to strive for success, that is why at TECH you will use Harvard case studies, with which we have a strategic agreement that allows us to offer you material from the best university in the world.

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

The case method has been the most widely used learning system among the world's leading business schools for as long as they have existed. 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.

In a given situation, what would you do? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, you will be presented with multiple real cases. You will have to combine all your knowledge, and research, argue, and defend your ideas and decisions.

Re-Learning Methodology

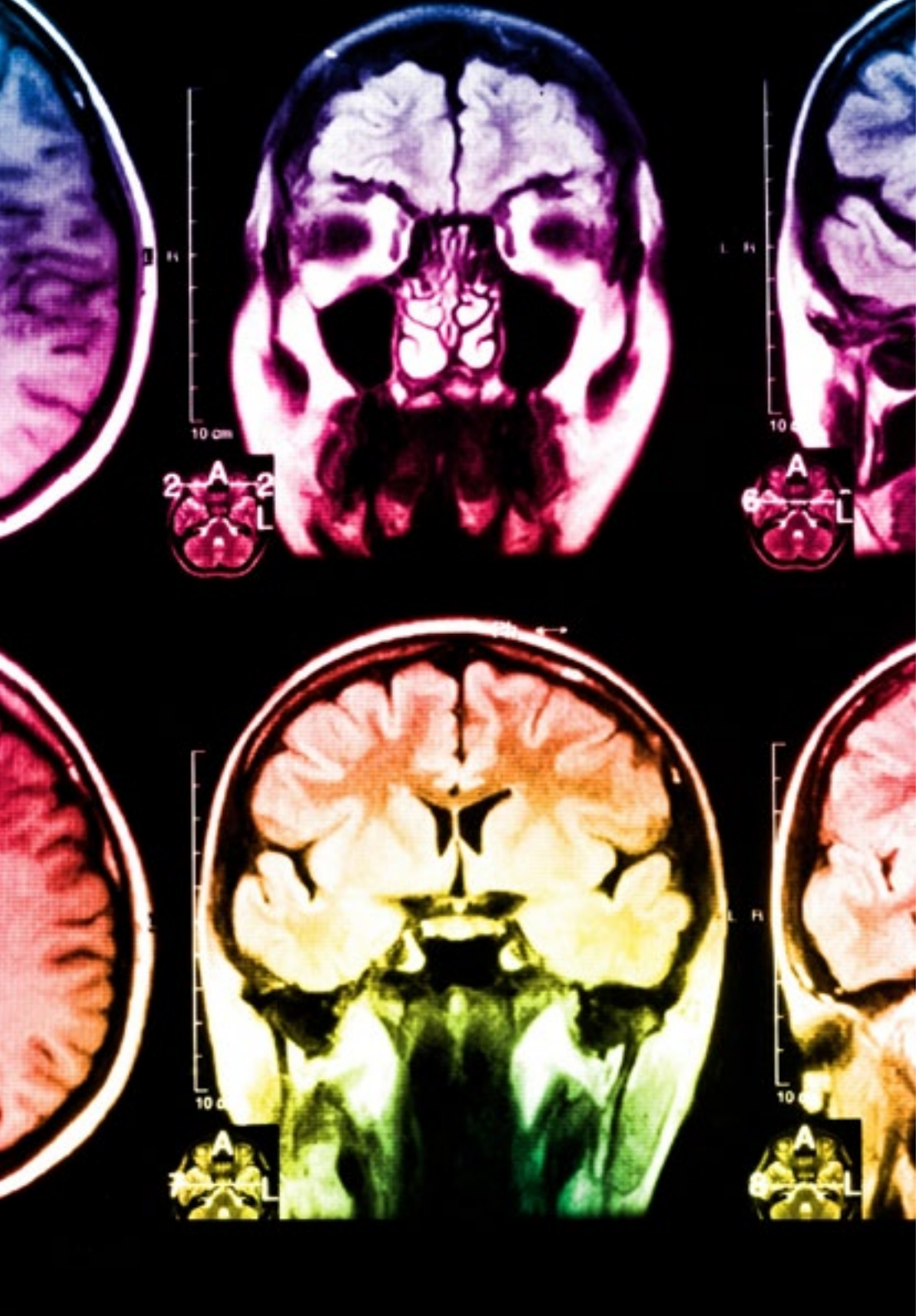
Our University is the first in the world to combine Harvard University case studies with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance Harvard case studies with the best 100% online teaching method: Re-learning.

In 2019 we obtained the best learning results of all Spanish-language 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 Re-learning.

Our University is the only one in Spanish-speaking countries licensed to incorporate 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 Spanish online university indicators.



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

Re-learning 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 to success

Based on the latest evidence in neuroscience, not only do we know how to organize information, ideas, images, memories, but we also know that the place and context where we have learned something is crucial for us to be able to remember it and store it in the hippocampus, and 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.

In this program you will have access to the best educational material, prepared with you 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.

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.

Classes

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

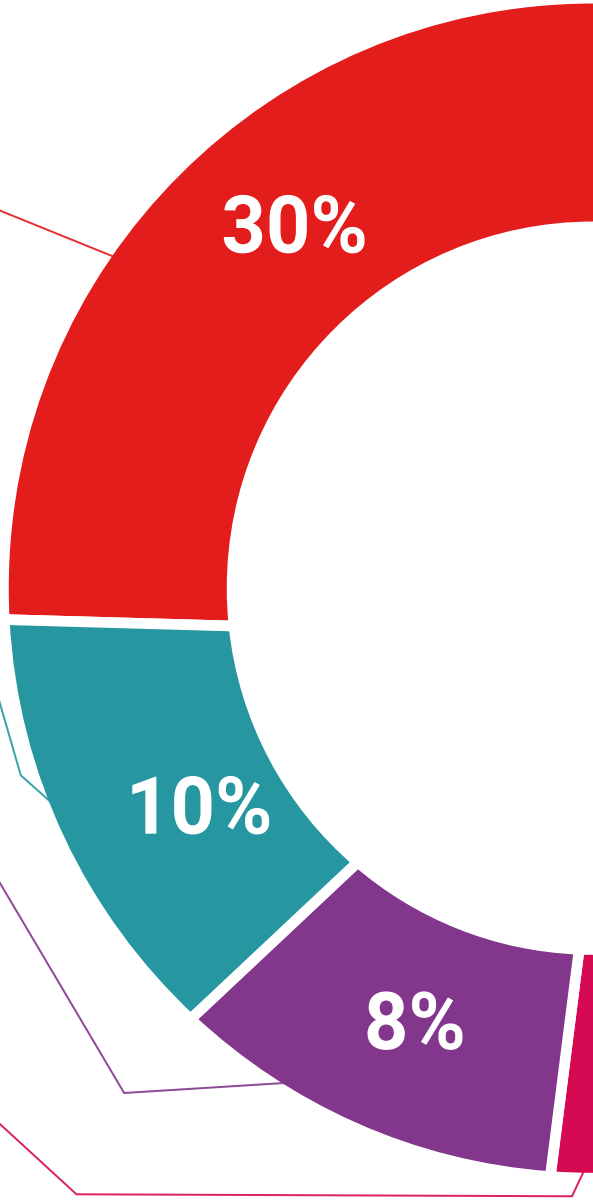
Learning from an expert strengthens knowledge and memory, and generates confidence in our future difficult decisions.

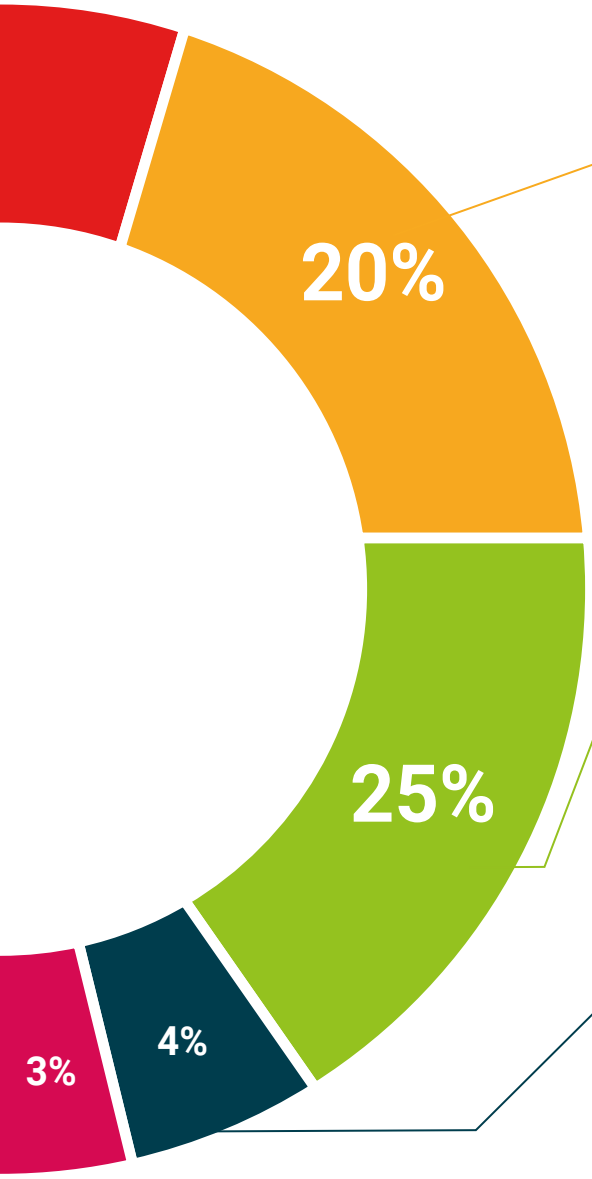
Practising Skills and Abilities

You 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 we live in.

Additional Reading

Recent articles, consensus documents, international guides. in our virtual library you will have access to everything you need to complete your training.





Case Studies

You will complete a selection of the best case studies in the field used at Harvard. Cases that are presented, analyzed, and supervised by the best senior management specialists in Latin America.

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 unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".

Testing & Re-testing

We periodically evaluate and re-evaluate your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.

06

Certificate

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

Include a Postgraduate Diploma in Mechanical Engineering: a high-quality added value for any professional"

This program will allow you to obtain your **Postgraduate Diploma in Mechanical Engineering** 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 Mechanical Engineering**

Modality: **online**

Duration: **6 months**

Accreditation: **24 ECTS**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Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Diploma in Mechanical Engineering

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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