Postgraduate Diploma

Mechanical Engineering Design

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Postgraduate Diploma
Mechanical Engineering Design

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

Website: **www.techtitute.com/us/engineering/postgraduate-diploma/postgraduate-diploma-mechanical-engineering-design**

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01

Introduction

This course takes a professional approach to the design of mechanical elements, starting with the choice of failure theories and the principles of tribilogy and lubrication, which are fundamental to ensure the durability of these elements and the energy efficiency of their operation.

Specialize in Mechanical Engineering Design with this high-level program, taught by industry professionals with extensive experience in the field.

A unique opportunity to achieve professional success.

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 Design 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 training, 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 Design** is the most comprehensive and up-to-date educational program on the market. The most important features of the program include:

- 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 training 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 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 training programmed to train in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professional will have to try to solve the different situations of Professional Practice, which will be posed throughout the Postgraduate Diploma. 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 Design** 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

- Train scientifically and technologically 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.
- Gain in-depth knowledge of Industry 4.0 applied to mechanical engineering.
- Gain in-depth knowledge of advanced and innovative mechanical engineering applications.

Specific Objectives

- Master all aspects of mechanical engineering design.
- Develop patents, utility models and industrial design.
- Evaluate the different failure theories for their application to each machine element.
- Analyze the behavior of different lubricants in specific machine applications.
- Design, analyze and evaluate machine components using state-of-the-art design tools.
- Evaluate the different alternatives for the design of machine elements.
- Design hydraulic and hydrostatic systems capable of generating, transmitting and storing energy.
- Design pneumatic systems capable of transmitting and storing energy.
- Design, analyze and evaluate industrial and building structures.
- Design, analyze and evaluate air conditioning, ventilation, sanitary water and sanitation installations in housing, industrial and tertiary buildings.
- Design, analyze and evaluate fire safety installations in all types of buildings.
- Design, analyze and evaluate special installations in all types of buildings.
- Design, analyze and evaluate acoustic and thermal insulation installations in all types of buildings.
- Design lighting, electrical power and control installations that fall within the remit of mechanical engineers.
- Create, evaluate and analyze designs combining mechanics and electronics.

- Design accelerated life testing and reliability improvement plans for mechanical components.
- Apply the principles of circular economy to the design of mechanical systems.
- Create maintenance plans based on the Reliability Centered Maintenance (RCM) methodology to ensure the safety and reliability of mechanical elements.

Join us and we will help you achieve professional excellence"

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

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. Design of Mechanical Elements

1.1. Failure Theories
- 1.1.1. Static Failure Theories
- 1.1.2. Dynamic Failure Theories
- 1.1.3. Fatigue

1.2. Tribology and Lubrication
- 1.2.1. Friction
- 1.2.2. Wear and Tear
- 1.2.3. Lubricants.

1.3. PTO Shaft Design
- 1.3.1. Shafts and PTO
- 1.3.2. Keyways and Splined Shafts
- 1.3.3. Flywheels

1.4. Rigid Transmission Design
- 1.4.1. Cams
- 1.4.2. Spur Gears
- 1.4.3. Bevel Gears
- 1.4.4. Helical Gears
- 1.4.5. Worm Screws

1.5. Flexible Transmission Design
- 1.5.1. Chain Transmissions
- 1.5.2. Belt Transmissions

1.6. Bearing Design
- 1.6.1. Friction Bearings
- 1.6.2. Bearings

1.7. Design of Brakes, Clutches and Couplings
- 1.7.1. Brakes
- 1.7.2. Clutch
- 1.7.3. Couplings

1.8. Mechanical Spring Design

1.9. Design of Non-Permanent Joints
  1.9.1. Bolted Joints
  1.9.2. Riveted Joints
1.10. Design of Permanent Joints
  1.10.1. Welded Joints
  1.10.2. Adhesive Joints

Module 2. Structures and Installations

2.1. Structure Calculations
  2.1.1. Beam Calculation
  2.1.2. Column Calculation
  2.1.3. Gantry Calculation
  2.1.4. Foundations
  2.1.5. Preloaded Structures
2.2. Low Voltage Electrical Installations
2.3. Air Conditioning and Ventilation Systems
  2.3.1. Heating Installations
  2.3.2. Air Conditioning Installations
  2.3.3. Ventilation Installations
2.4. Sanitary Water Installations and Sewage Systems
  2.4.1. Water Installations
  2.4.2. Domestic Hot Water Installations - DHW
  2.4.3. Sanitation Networks
2.5. Fire Safety Installations
  2.5.1. Portable Extinguishing Systems
  2.5.2. Detection and Alarm Systems
  2.5.3. Automatic Extinguishing Systems
  2.5.4. BIEs, Dry Columns and Hydrants
2.6. Communication, Home Automation and Security Installations
2.7. Thermal and Acoustic Insulation

2.8. Steam, Compressed Air and Medical Gas Installations
  2.8.1. Steam Installations
  2.8.2. Compressed Air Installations
  2.8.3. Medical Gas Installations
2.9. Gas and Liquid Fuel Installations
  2.9.1. Natural Gas Installations
  2.9.2. Liquefied Petroleum Gas Installations
  2.9.3. Liquid Hydrocarbon Installations
2.10. Energy Certifications
  2.10.1. Energy Demand Control
  2.10.2. Renewable Energy Contribution
  2.10.3. Energy Audits
  2.10.4. ISO 50001 Energy Certification

Module 3. Design for Manufacturing

3.1. Design for Manufacturing
3.2. Forming by Molding
  3.2.1. Melting
  3.2.2. Injection
3.3. Forming by Deformation
  3.3.1. Plastic Deformation
  3.3.2. Stamping
  3.3.3. Fprging
  3.3.4. Extrusion.
3.4. Conformation Due to Loss of Material
  3.4.1. Abrasion
  3.4.2. By Chip Removal
3.5. Heat Treatment
  3.5.1. Quenching
  3.5.2. Tempering
  3.5.3. Annealing
  3.5.4. Normalizing
  3.5.5. Thermochemical Treatments
3.6. Application of Paints and Coatings
  3.6.1. Electrochemical Treatments
  3.6.2. Electrolytic Treatments
  3.6.3. Paints, Lacquers and Varnishes
3.7. Forming of Polymers and Ceramic Materials
3.8. Manufacture of Composite Parts
3.9. Additive Manufacturing
  3.9.1. Powder Bed Fusion
  3.9.2. Direct Energy Deposition
  3.9.3. Binder jetting
  3.9.4. Bound Powder Extrusion
3.10. Robust Engineering
  3.10.1. Taguchi's Method
  3.10.2. Experiment Design
  3.10.3. Statistical Process Control

Module 4. Design for Reliability, Safety and Environment

4.1. RAMS Fundamentals of Engineering
- 4.1.1. Reliability, Maintainability and Availability Functions
- 4.1.2. Failure Curves
- 4.1.3. Statistical Distributions

4.2. Reliability of Elements

4.3. System Reliability
- 4.3.1. Reliability Block Diagrams - RBD

4.4. Reliability Analysis I - Qualitative Methods
- 4.4.1. Failure Mode and Effects Analysis - FMEA

4.5. Reliability Analysis II - Quantitative Methods
- 4.5.1. Failure Tree Analysis - FTA

4.6. Improved Reliability and Accelerated Life Testing
- 4.6.1. Reliability Improvement Plans
- 4.6.2. Accelerated Life Testing - HASS/HALT

4.7. Machine Safety
- 4.7.1. Security Management Programs

4.8. Risk Analysis
- 4.8.1. Risk Matrix
- 4.8.2. ALARP
- 4.8.3. Operational Hazard Studies - HAZOP
- 4.8.4. Safety Level - SIL
- 4.8.5. Event Tree Analysis - ETA
- 4.8.6. Root Cause Analysis - RCA

4.9. Environment and Circular Economy
- 4.9.1. Environmental Management
- 4.9.2. The Fundamentals of Circular Economy

4.10. Reliability Centered Maintenance - RCM
- 4.10.1. SAE Standard JA1011
- 4.10.2. Failure Management Policies

A comprehensive and multidisciplinary training program that will allow you to excel in your career, following the latest advances in the field of Mechanical Engineering"

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- Technological University 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 Technological University 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

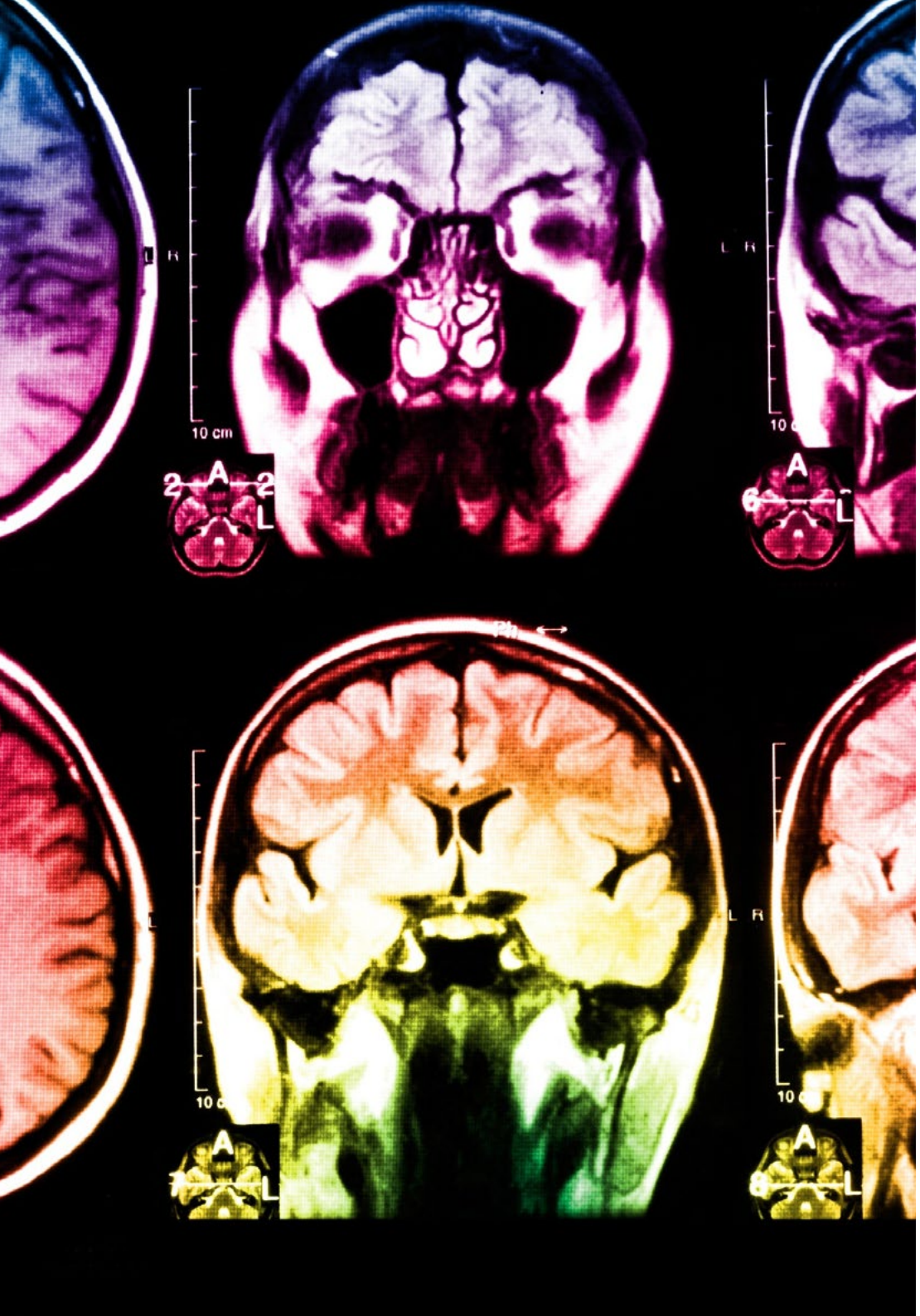
Our University is the first in the world to combine Harvard University case studies with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

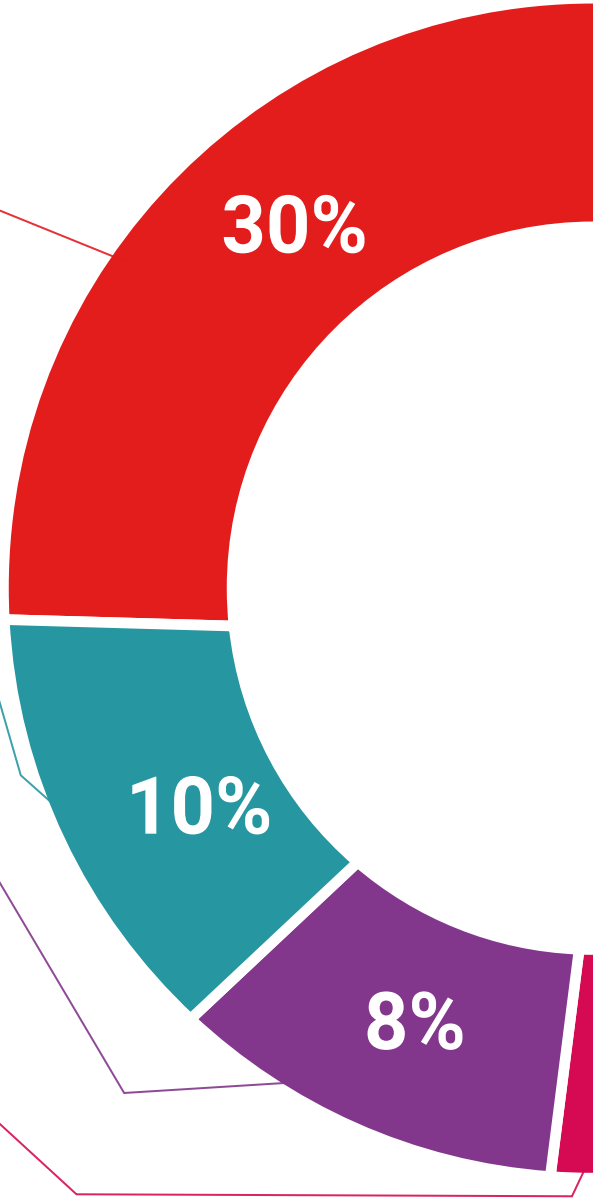
Learning from an expert strengthens knowledge and memory, and generates confidence in our future difficult decisions.

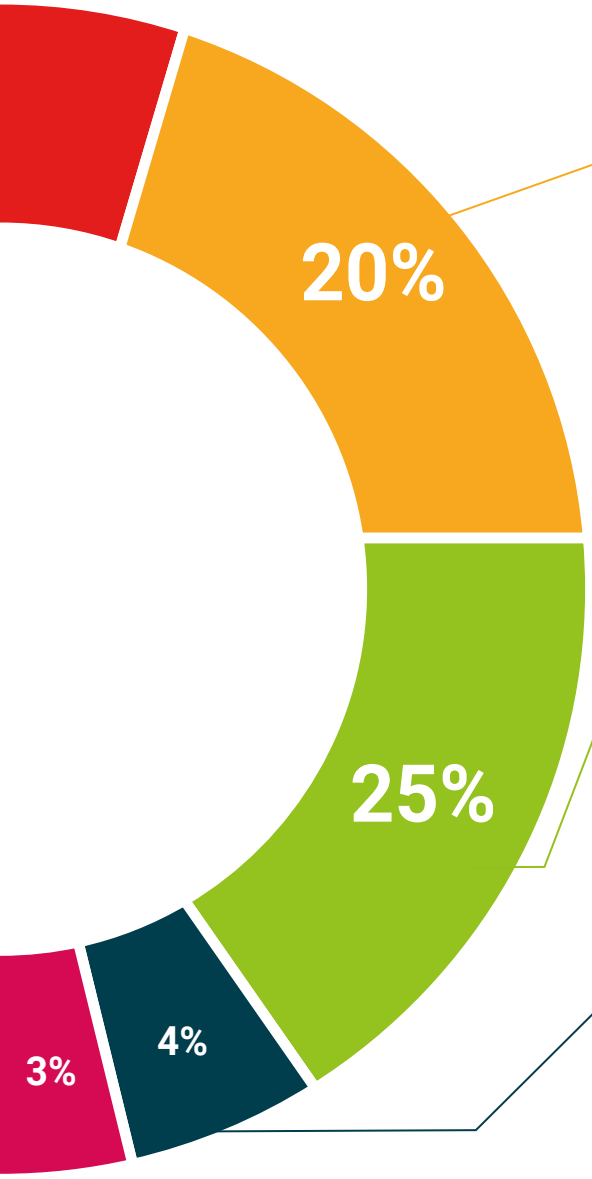
Practising Skills and Abilities

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

Through a different and stimulating learning experience, you will be able to acquire the necessary skills to take a big step in your training. An opportunity to progress, with the support and monitoring of a modern and specialized university, which will propel you to another professional level.

Include in your training a Postgraduate Diploma in Mechanical Engineering Design: a highly qualified added value for any professional in the field of education"

This **Postgraduate Diploma in Mechanical Engineering Design is the most comprehensive and up-to-date educational program on the market.**

Once the student has passed the evaluation, they will receive by post, with acknowledgement of receipt, their corresponding **Postgraduate Diploma** issued by **TECH-Technological University.**

The diploma issued by **TECH-Technological University** will specify the qualification obtained though the Postgraduate Diploma , and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional from career evaluation committees.

Title: **Postgraduate Diploma in Mechanical Engineering Design**

ECTS: **24**

Official Number of Hours: **600**


tech technological university

Awards the following

DIPLOMA

to

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

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

Mechanical Engineering Design

This is a qualification awarded by this University, with 24 ECTS credits and equivalent to 600 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

Tere Guevara Navarro

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

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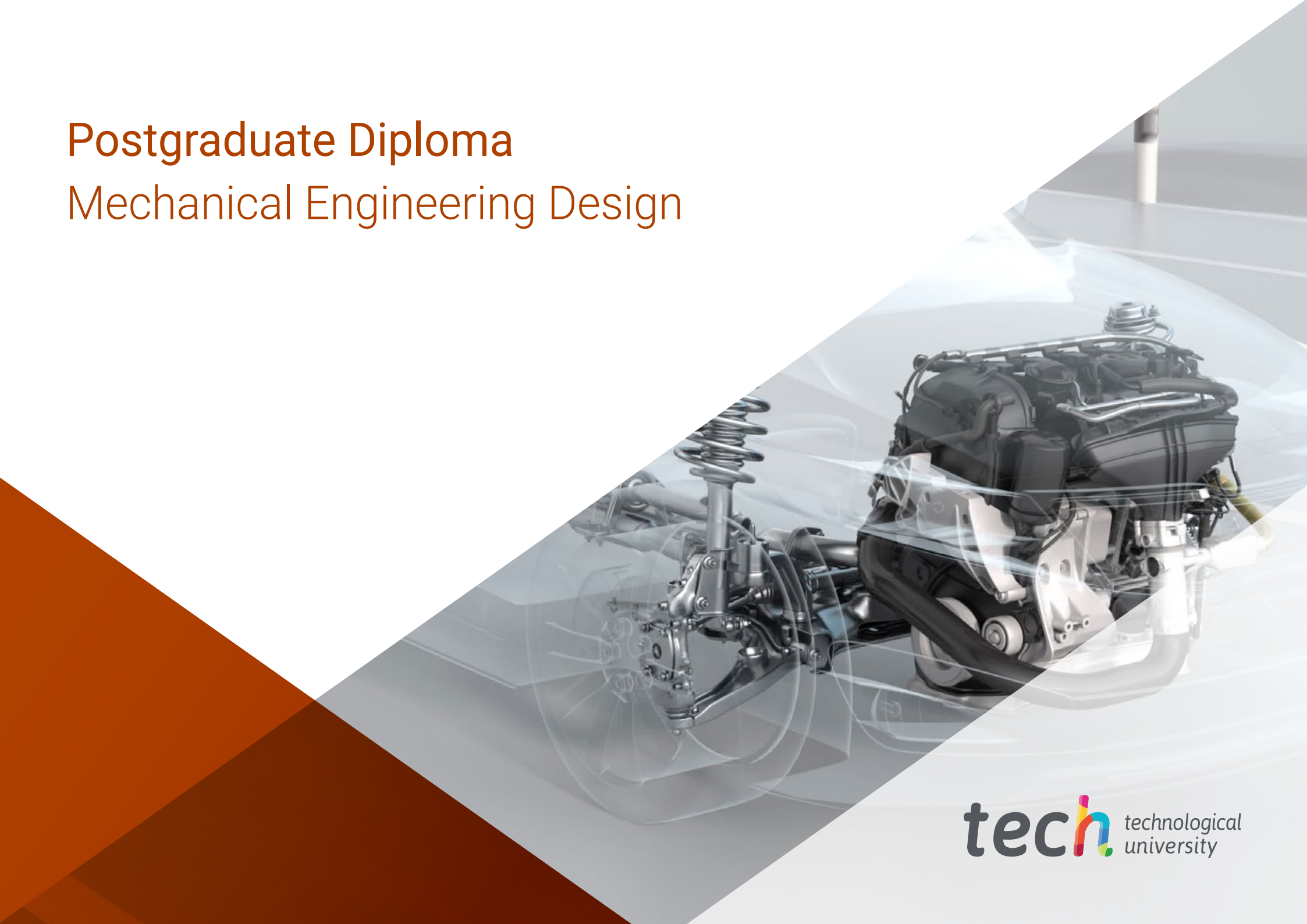

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