Postgraduate Diploma
Mechanism Design

tech global university

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Postgraduate Diploma

Mechanism Design

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Global University**
- Credits: **18 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/design/postgraduate-diploma/postgraduate-diploma-mechanism-design

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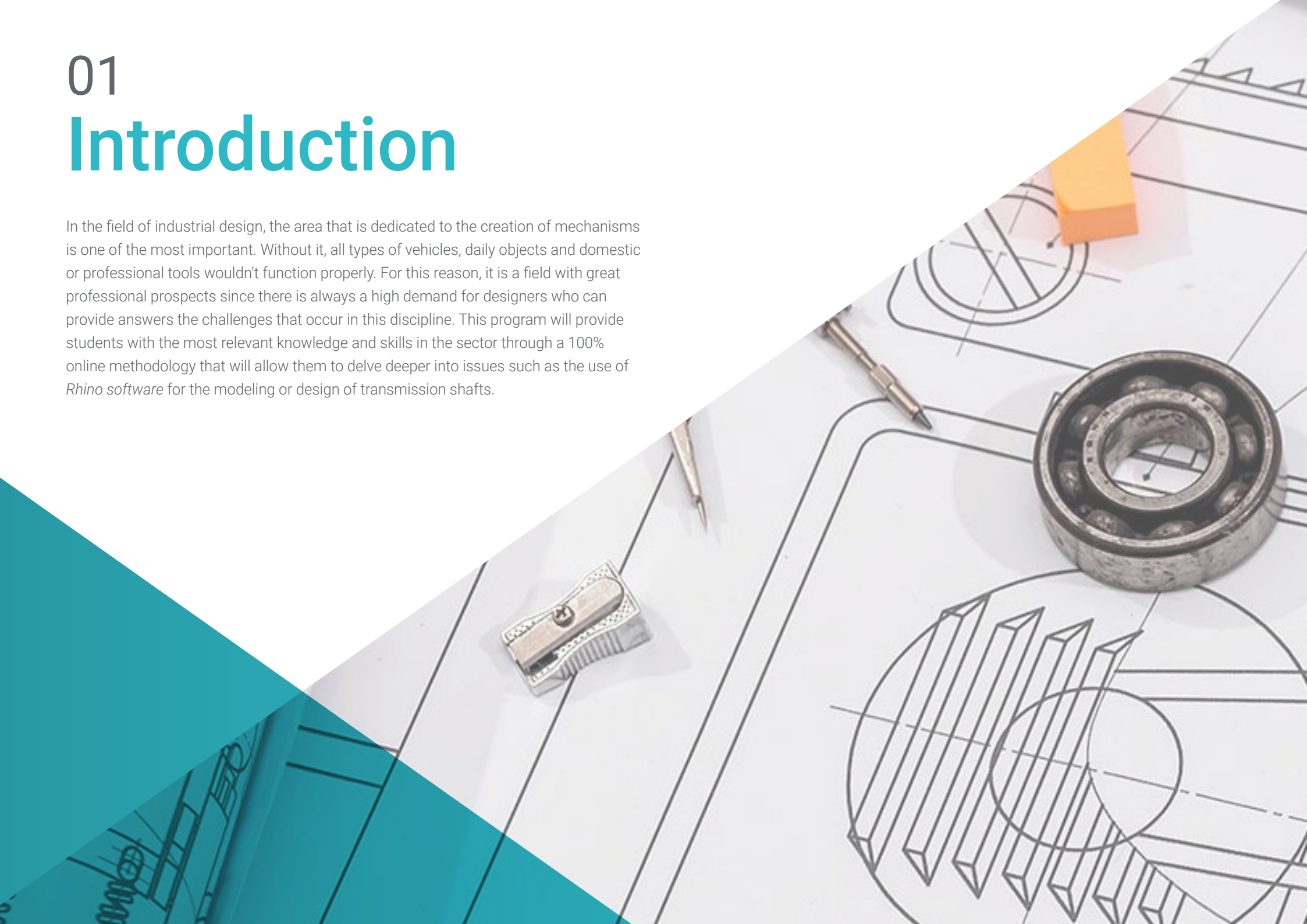
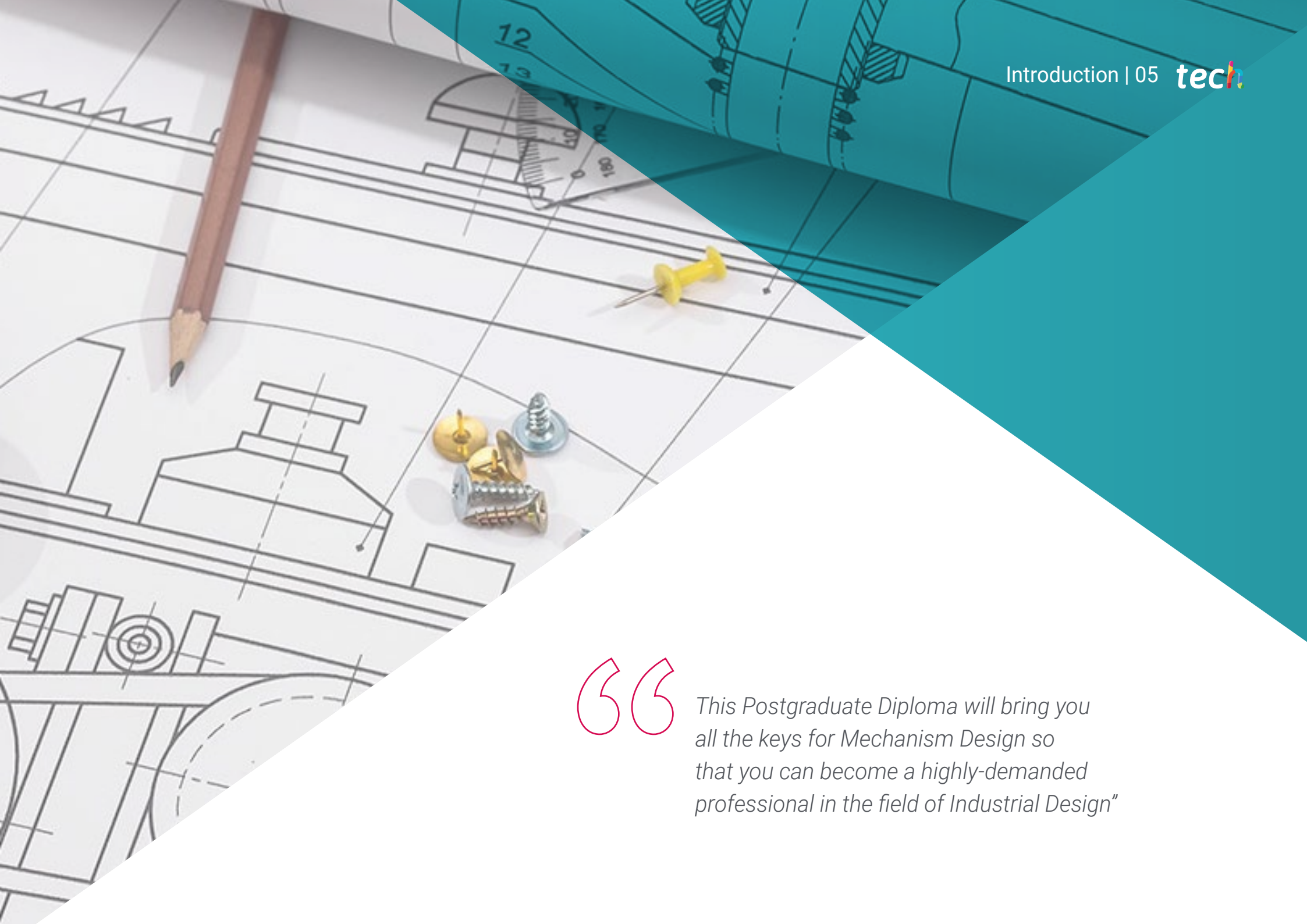
01

Introduction

In the field of industrial design, the area that is dedicated to the creation of mechanisms is one of the most important. Without it, all types of vehicles, daily objects and domestic or professional tools wouldn't function properly. For this reason, it is a field with great professional prospects since there is always a high demand for designers who can provide answers the challenges that occur in this discipline. This program will provide students with the most relevant knowledge and skills in the sector through a 100% online methodology that will allow them to delve deeper into issues such as the use of *Rhino software* for the modeling or design of transmission shafts.





This Postgraduate Diploma will bring you all the keys for Mechanism Design so that you can become a highly-demanded professional in the field of Industrial Design"

One of the most important areas of product design is mechanism design. It is a vital discipline for the functioning of all types of tools, vehicles and devices. Despite this, it is not widely recognized, so there is often a shortage of specialized professionals in the sector. For that reason, this field has great job opportunities that the designer can take advantage of if they are properly trained.

This Postgraduate Diploma in Mechanism Design has been carefully designed to provide the student with the most advanced knowledge in the field, so that they can become a great specialist ready to take on this important task in a large industrial company. In order to achieve this objective, this program will go in depth into issues such as fundamental layouts in the plane, fundamental geometrical elements, the design of flexible transmissions or the modeling of mechanisms with Rhino software.

All of this is based on an online learning system that will allow the professional to combine work and studies, since it adapts to their personal circumstances. In addition, this degree will provide you with full access, 24 hours a day, to its contents, presented in a variety of multimedia materials that will make teaching a simple and effective process.

This **Postgraduate Diploma in Mechanism Design** contains the most complete and up-to-date program on the market. The most important features include:

- Practical cases presented by experts in Industrial Design
- 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 self-assessment can be used 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

The industrial sector offers great professional opportunities and when you complete this program you will be able to access them, having become a great expert in Mechanism Design"

This program offers the most advanced multimedia materials: theoretical and practical exercises, videos, master classes, etc., to learn the best mechanism design techniques"

You will deepen your knowledge in the use of Rhino software to perform large modeling applied to Mechanism Design.

The online methodology at TECH will allow you to choose the moment and the place to study, given that it can be completely adapted to your personal and professional circumstances.

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

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Objectives

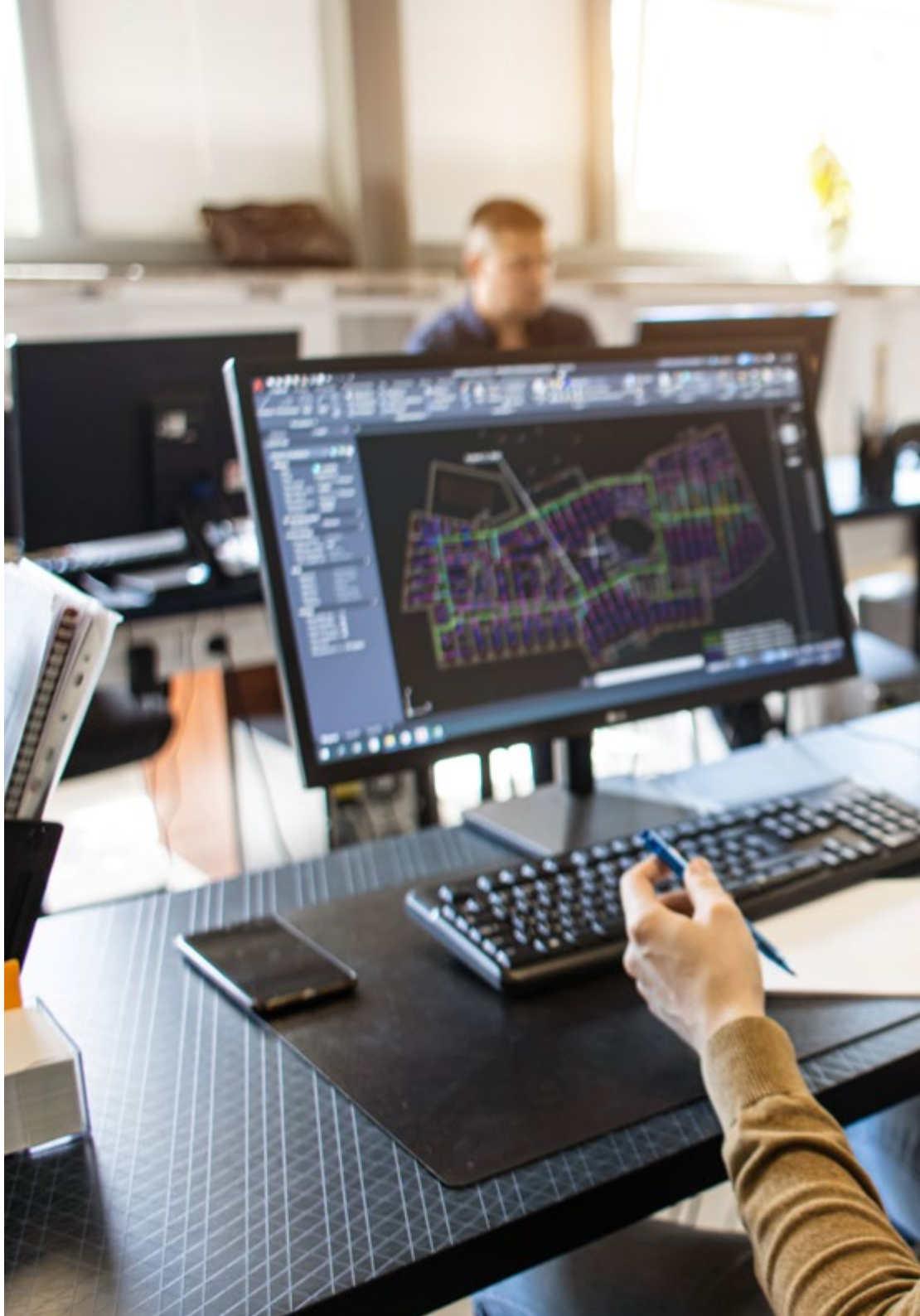
The main objective of this Postgraduate Diploma in Mechanism Design is to provide the student with all the tools, knowledge and necessary skills to develop professionally in this industrial field. Thus, TECH has been responsible for bringing together the latest content in this area, while facilitating the designer's learning process thanks to the online methodology with which the program has been developed.

Numerous companies in the industrial sector are looking for mechanism designers. Enroll now and gain access to the best professional opportunities with TECH"

General Objectives

- Learn to plan, develop and present artistic productions appropriately, using effective production strategies and with their own creative contributions
- Acquire theoretical and practical methodological knowledge necessary for the realization of technical projects
- Analyze and evaluate materials used in engineering based on their properties
- Deepen knowledge in the innovation and technology transfer processes for the development of new products and processes and the establishment of a new state of the art
- Master Rhino Software in order to do mechanism modeling

All your professional goals will be within your reach when you complete this Postgraduate Diploma"



Specific Objectives

Module 1. Technical Representation Systems

- Use knowledge of representation systems as a tool in the search for solutions to design problems
- Develop conception and spatial vision, obtaining new tools that encourage the promotion and generation of ideas
- Learn to represent objects in the dihedral, axonometric and conical systems as a means of conveying an idea of how to create them

Module 2. Design of Mechanical Elements

- Master all aspects of Mechanical Engineering design
- Develop patents, utility models and industrial designs
- Evaluate the different failure theories for their application to each machine element
- Design, analyze and evaluate machine components using state-of-the-art design tools
- Evaluate the different alternatives for the design of machine elements

Module 3. Technical Modeling in Rhino

- Have a broad understanding of how the NURBS modeling software works
- Work with precision modeling systems
- Work with an organization in the scenes

03

Structure and Content

Leading experts in industrial design have been in charge of developing the contents and materials of this program, taking into account the current needs of the sector. Thus, the knowledge provided by this Postgraduate Diploma is eminently focused on the work environment and, in line with the learning method used by TECH, the designer will be able to learn through practice, since the degree has numerous exercises and activities. Through these resources, therefore, the student will learn more about issues such as editing geometry with *Rhino* or the fundamental tracings in the plane.

You are just one step away from accessing the most advanced knowledge in this field of design. Enroll now and discover how your career can progress immediately"

Module 1. Technical Representation Systems

1.1. Introduction to Flat Geometry
- 1.1.1. The Fundamental Material and Its Use
- 1.1.2. Fundamental Tracings in the Plane
- 1.1.3. Polygons. Metric Ratios
- 1.1.4. Standardization, Lines, Writing and Formats
- 1.1.5. Standardized Dimensioning
- 1.1.6. Scales
- 1.1.7. Technical Representation Systems
  - 1.1.7.1. Types of Projection
    - 1.1.7.1.1. Conical Projection
    - 1.1.7.1.2. Orthogonal Cylindrical Projection
    - 1.1.7.1.3. Oblique Cylindrical Projection
  - 1.1.7.2. Classes of Representation Systems
    - 1.1.7.2.1. Measuring Systems
    - 1.1.7.2.2. Perspective Systems

1.2. Fundamental Tracings in the Plane
- 1.2.1. Fundamental Geometrical Elements
- 1.2.2. Perpendicularity
- 1.2.3. Parallelism
- 1.2.4. Operations With Segments
- 1.2.5. Angles
- 1.2.6. Circumferences
- 1.2.7. Geometric Places

1.3. Geometric Transformations
- 1.3.1. Isometric
  - 1.3.1.1. Equality
  - 1.3.1.2. Translation
  - 1.3.1.3. Symmetry
  - 1.3.1.4. Turn
- 1.3.2. Isomorphic
  - 1.3.2.1. Homothecary
  - 1.3.2.2. Similarities

1.3.3. Anamorphic
1.3.3.1. Equivalents
1.3.3.2. Investments
1.3.4. Projective
1.3.4.1. Homology
1.3.4.2. Affine Homology or Affinity
1.4. Polygons
1.4.1. Polygon Lines
1.4.1.1. Definition and Types
1.4.2. Triangles
1.4.2.1. Elements and Classification
1.4.2.2. Construction of Triangles
1.4.2.3. Notable Lines and Points
1.4.3. Quadrilaterals
1.4.3.1. Elements and Classification
1.4.3.2. Parallelograms
1.4.4. Regular Polygons
1.4.4.1. Definition
1.4.4.2. Construction
1.4.5. Perimeters and Areas
1.4.5.1. Definition. Measuring Areas
1.4.5.2. Surface Units
1.4.6. Polygon Areas
1.4.6.1. Quadrilateral Areas
1.4.6.2. Triangle Areas
1.4.6.3. Regular Polygon Areas
1.4.6.4. Irregular Areas
1.5. Tangents and Links. Technical and Conic Curves
1.5.1. Tangents, Links and Polarity
1.5.1.1. Tangents
1.5.1.1.1. Tangency Theorems
1.5.1.1.2. Drawings of Tangent Lines
1.5.1.1.3. Straight and Curved Links
1.5.1.2. Polarity at the Circumference
1.5.1.2.1. Drawings of Tangent Lines
1.5.2. Technical Curves
1.5.2.1. Ovals
1.5.2.2. Ovoids
1.5.2.3. Spirals
1.5.3. Conical Curves
1.5.3.1. Ellipse
1.5.3.2. Parabola
1.5.3.3. Hyperbola
1.6. Dihedral System
1.6.1. General Aspects
1.6.1.1. Point and Line
1.6.1.2. The Plane. Intersections
1.6.1.3. Parallelism, Perpendicularity and Distances
1.6.1.4. Plane Changes
1.6.1.5. Turns
1.6.1.6. Reductions
1.6.1.7. Angles
1.6.2. Curves and Surfaces
1.6.2.1. Curves
1.6.2.2. Surfaces
1.6.2.3. Polyhedra
1.6.2.4. Pyramids
1.6.2.5. Pryzm
1.6.2.6. Cone
1.6.2.7. Cylinder
1.6.2.8. Revolution Surfaces
1.6.2.9. Intersection of Surfaces
1.6.3. Shade
1.6.3.1. General Aspects
1.7. System Boundary
1.7.1. Point, Line and Plane
1.7.2. Intersections and Reductions
1.7.2.1. Reductions
1.7.2.2. Applications

1.7.3. Parallelism, Perpendicularity, Distance and Angles
1.7.3.1. Perpendicularity
1.7.3.2. Distances
1.7.3.3. Angles
1.7.4. Line, Surfaces and Terrains
1.7.4.1. Terrains
1.7.5. Applications
1.8. Axonometric System
1.8.1. Orthogonal Axonometry: Point, Line and Plane
1.8.2. Orthogonal Axonometry: Intersections, Reductions and Perpendicularity
1.8.2.1. Reductions
1.8.2.2. Perpendicularity
1.8.2.3. Flat Shapes
1.8.3. Orthogonal Axonometry: Body Perspective
1.8.3.1. Representation of Bodies
1.8.4. Oblique Axonometry: Abatisms, Perpendicularity
1.8.4.1. Frontal Perspective
1.8.4.2. Reduction and Perpendicularity
1.8.4.3. Flat Figures
1.8.5. Oblique Axonometry: Body Perspective
1.8.5.1. Shade
1.9. Conical System
1.9.1. Conical or Central Projection
1.9.1.1. Intersections
1.9.1.2. Parallelisms
1.9.1.3. Reductions
1.9.1.4. Perpendicularity
1.9.1.5. Angles
1.9.2. Lineal Perspective
1.9.2.1. Auxiliary Constructions
1.9.3. Lines and Surfaces Perspective
1.9.3.1. Practical Perspective
1.9.4. Perspective Methods
1.9.4.1. Tilted Frame
1.9.5. Prospective Restitutions
1.9.5.1. Reflexes
1.9.5.2. Shade
1.10. The Sketch
1.10.1. Objectives of the Sketch
1.10.2. The Proportion
1.10.3. Sketch Process
1.10.4. Point of View
1.10.5. Labeling and Graphic Symbols
1.10.6. Measurement

Module 2. Design of Mechanical Elements

2.1. Theories of Failure
2.1.1. Static Failure Theories
2.1.2. Dynamic Failure Theories
2.1.3. Fatigue
2.2. Tribology and Lubrication
2.2.1. Friction
2.2.2. Wear and Tear
2.2.3. Lubricants
2.3. Propshaft Design
2.3.1. Shafts and Axles
2.3.2. Keyways and Splined Shafts
2.3.3. Flywheels
2.4. Rigid Transmission Design
2.4.1. Cams
2.4.2. Spur Gears
2.4.3. Bevel Gears
2.4.4. Helical Gears
2.4.5. Worm Screws
2.5. Flexible Transmission Design
2.5.1. Chain Drives
2.5.2. Belt Drives

2.6. Bearing Design
- 2.6.1. Friction Bearings
- 2.6.2. Roller Bearings

2.7. Design of Brakes, Clutches and Couplings
- 2.7.1. Brakes
- 2.7.2. Clutches
- 2.7.3. Couplings

2.8. Mechanical Spring Design

2.9. Design of Non-Permanent Joints
- 2.9.1. Bolted Joints
- 2.9.2. Riveted Joints

2.10. Design of Permanent Connections
- 2.10.1. Welded Joints
- 2.10.2. Adhesive Joints

Module 3. Technical Modeling in Rhino

3.1. Rhino Modeling
- 3.1.1. Rhino Interface
- 3.1.2. Types of Objects
- 3.1.3. Navigating the Model

3.2. Fundamental Notions
- 3.2.1. Editing with Gumball
- 3.2.2. Viewports
- 3.2.3. Modeling Support

3.3. Precision Modeling
- 3.3.1. Input by Coordinates
- 3.3.2. Distance and Angle Restriction Input
- 3.3.3. Object Restriction

3.4. Command Analysis
- 3.4.1. Additional Modeling Support
- 3.4.2. SmartTrack
- 3.4.3. Construction Planes

3.5. Lines and Polylines
- 3.5.1. Circles
- 3.5.2. Free-Form Lines
- 3.5.3. Helix and Spiral

3.6. Geometry Editing
- 3.6.1. Fillet and Chamfer
- 3.6.2. Mixture of Curves
- 3.6.3. Loft

3.7. Transformations I
- 3.7.1. Move - Rotate - Scale
- 3.7.2. Join - Prune - Extend
- 3.7.3. Separate - Offset - Formations

3.8. Creating Shapes
- 3.8.1. Deformable Shapes
- 3.8.2. Modeling With Solids
- 3.8.3. Transformation of Solids

3.9. Creating Surfaces
- 3.9.1. Simple Surfaces
- 3.9.2. Extrusion, *Lofting* and Surface Finishing
- 3.9.3. Surface Sweeping

3.10. Organisation
- 3.10.1. Layers
- 3.10.2. Groups
- 3.10.3. Blocks

04

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 we face 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

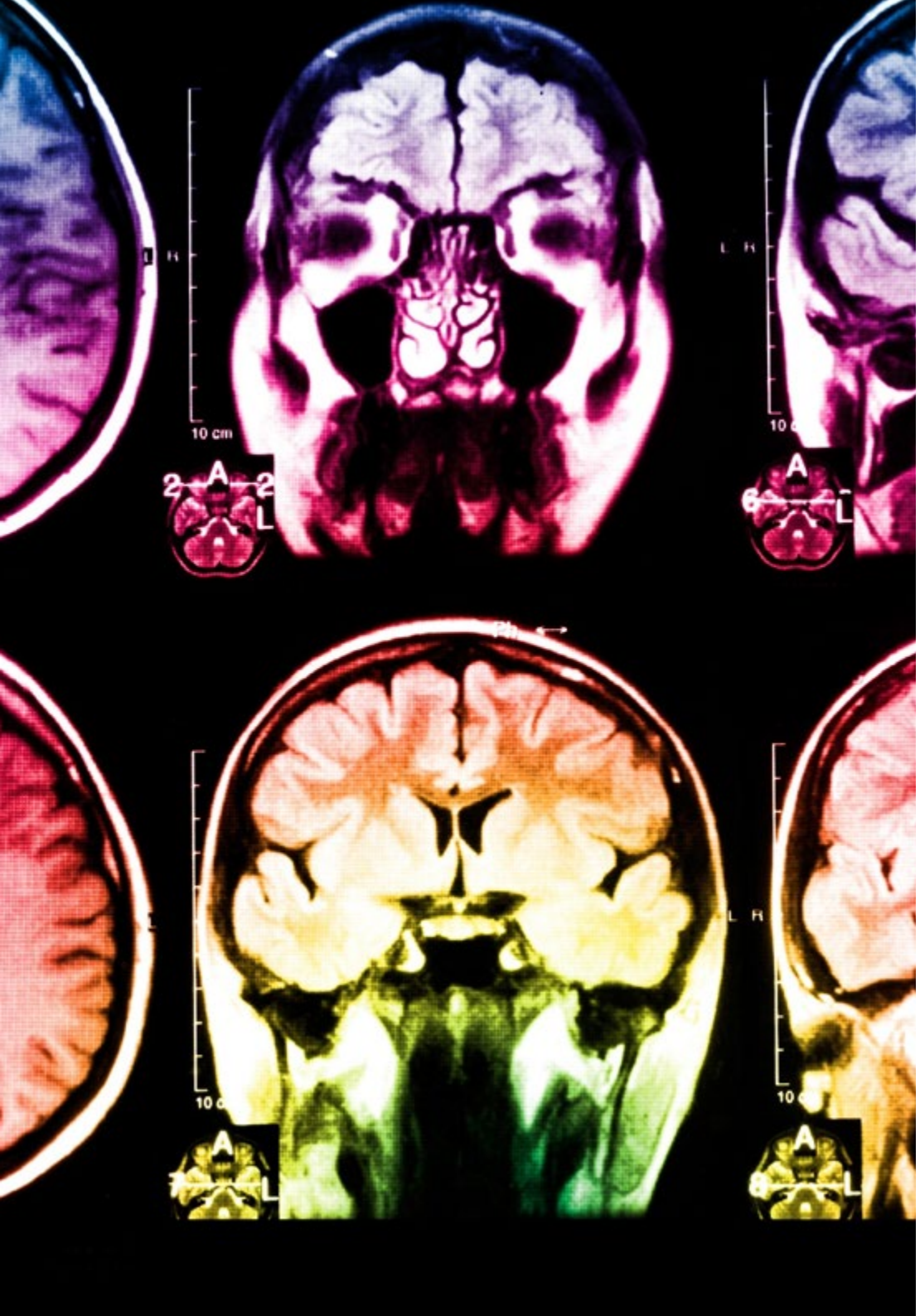
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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. 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.

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.

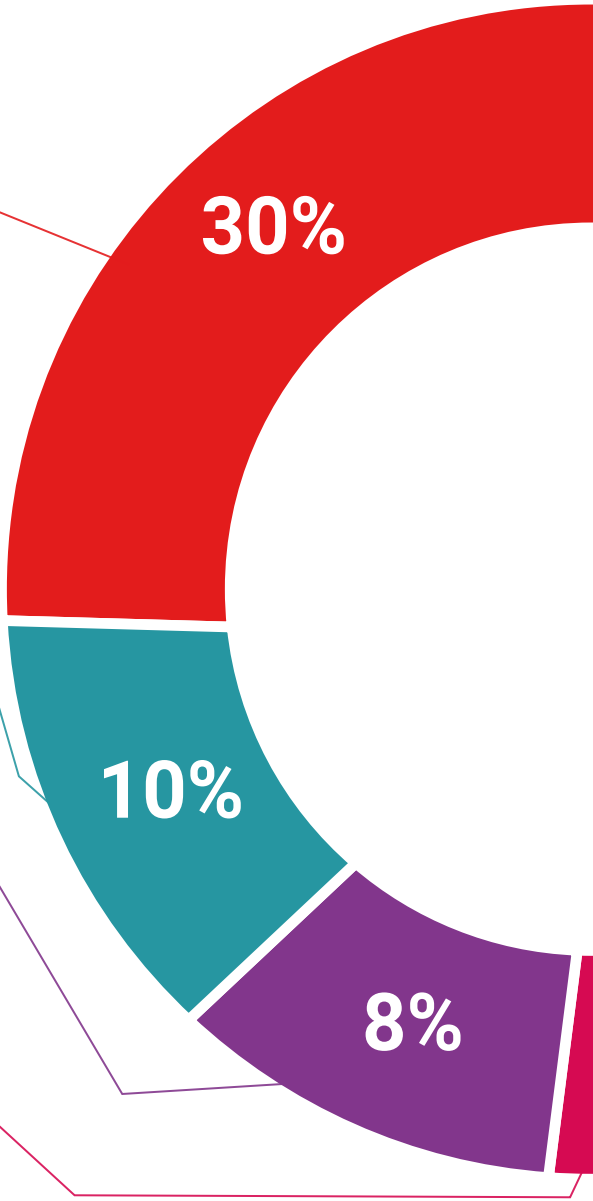
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

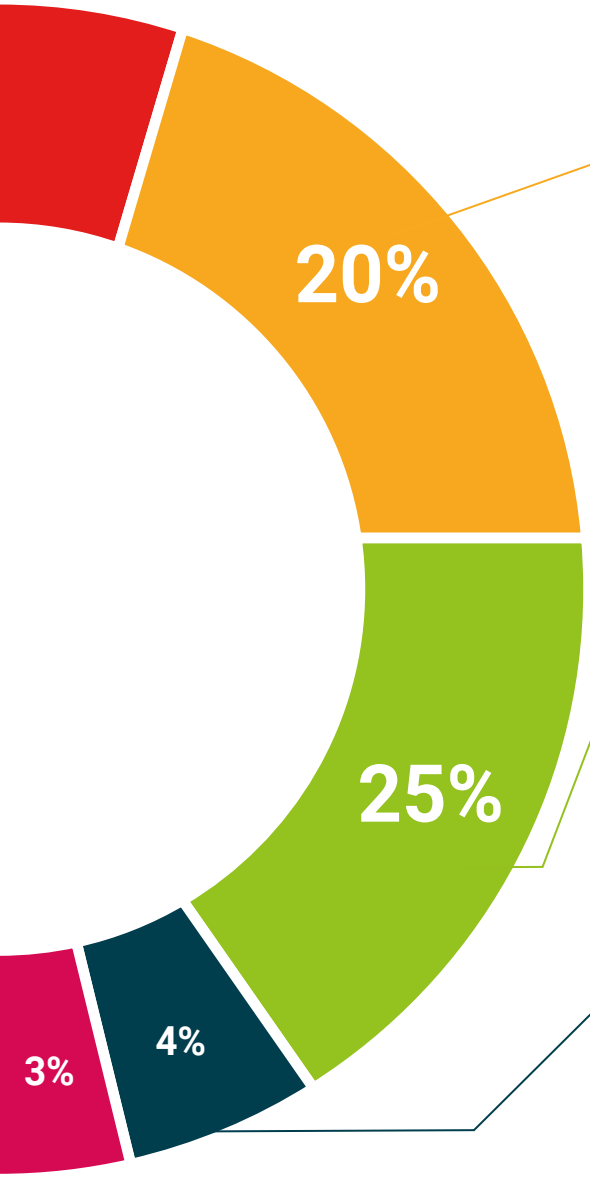
Practising Skills and Abilities

They will carry out activities to develop specific competencies and skills in each thematic 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.

05

Certificate

The Postgraduate Diploma in Mechanism Design guarantees you, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Global University.

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

This program will allow you to obtain your **Postgraduate Diploma in Mechanism Design** 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 Mechanism Design**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**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Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Diploma in Mechanism Design

This is a program of 450 hours of duration equivalent to 18 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

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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