

# Postgraduate Diploma Hard Surface Modeling





## Postgraduate Diploma Hard Surface Modeling

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

Website: [www.techtute.com/us/information-technology/postgraduate-diploma/postgraduate-diploma-hard-surface-modeling](http://www.techtute.com/us/information-technology/postgraduate-diploma/postgraduate-diploma-hard-surface-modeling)

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Certificate

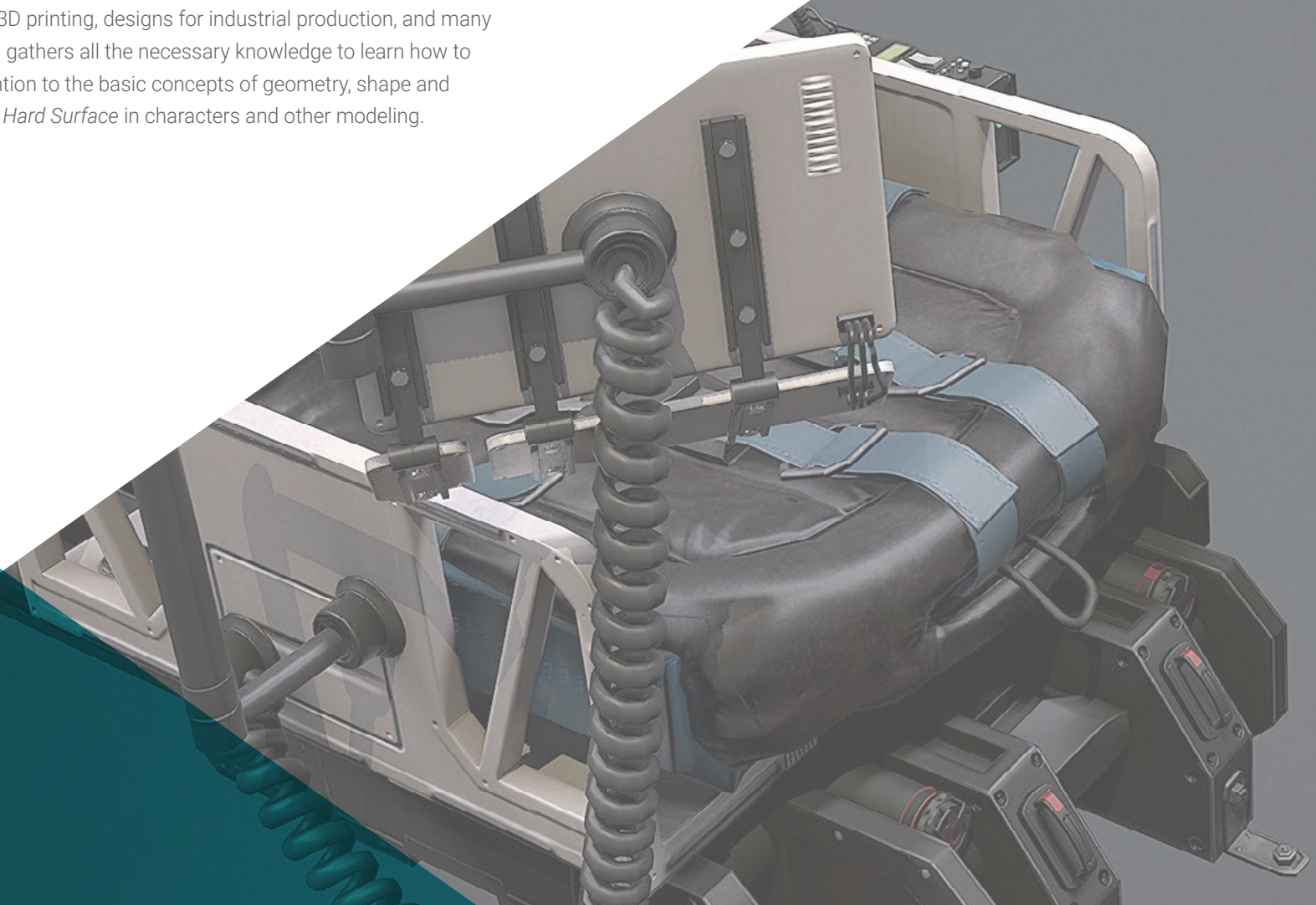
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# 01

# Introduction

*Hard Surface* modeling is considered a precision modeling that has given three-dimensional designs a considerable level of realism, since it achieves finishes as if they were made with machinery: milling, turning or riveting. This type of modeling has revolutionized the concept of 3D design as it has an infinite number of applications, for example, in terms of representation of architectural plans, 3D printing, designs for industrial production, and many more. That is why this online program gathers all the necessary knowledge to learn how to model *Hard Surface* with special attention to the basic concepts of geometry, shape and topology, as well as the application of *Hard Surface* in characters and other modeling.





“

*Learn how to model in Hard Surface and give realistic finishes to hard surfaces, just as if you had shaped a machine in reality: milling, turning, riveting and many more"*

This Postgraduate Diploma delves into the Hard Surface modeling technique, which has evolved to become a precision modeling for hard surfaces, since, due to the possibilities it offers, it achieves hyper-realistic finishes on hard surfaces and adapts to the parameters of engineers, architects, designers, animators, among others.

The syllabus covers the basic and essential theoretical concepts of geometry, shapes and topology, which allows the development of a criterion for the creation or edition of components in the modeling to be worked on. Secondly, the different modeling techniques applied with Hard Surface and their principles will be analyzed. In this section we delve into the mapping and texturing of 3D meshes, a fundamental process to give realistic effects to surfaces.

Finally, we work on the modeling of a character or creature with Sculpt, a simplified modeling technique but that offers fantastic results, being able to achieve different types of textures such as skin, feathers, fur and others, favoring that detail finish on all types of surfaces.

The content of this Postgraduate Diploma is condensed into an online program that allows students to adapt their learning pace to other personal or professional projects. The educational methodology is based on Relearning and learning by doing, which guarantees learning in an autonomous and progressive manner. In addition, the program has audiovisual materials available on the virtual platform, so that they can be consulted at any time.

This **Postgraduate Diploma in Hard Surface Modeling** the most complete and up-to-date program on the market. The most important features include:

- ◆ The development of case studies presented by experts in 3D Hard Surface Modeling
- ◆ The graphic, schematic, and practical contents with which they are created, provide practical information on the disciplines that are essential for professional practice
- ◆ Practical exercises where the self-assessment process can be carried out to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*With a re-learning and learning by doing methodology, this online Postgraduate Diploma will give you the keys to become an expert in Hard Surface modeling"*

“

*Hard Surface Modeling is one of the most required techniques in the field of three-dimensional modeling because of its ability to offer very realistic finishes"*

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 throughout the program. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

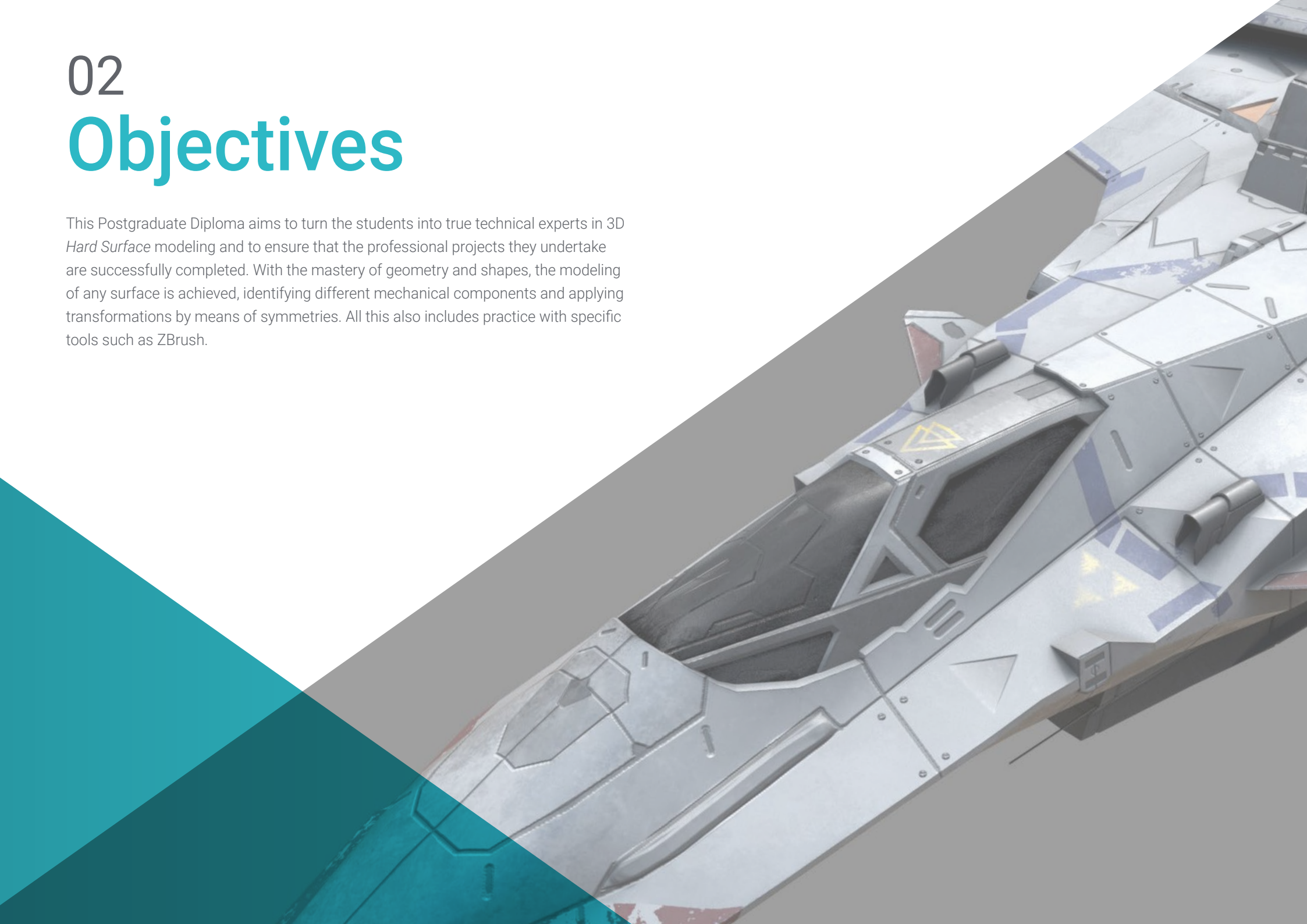
*With a fully online educational program, you can enjoy learning at your own pace and speed.*

*Are you thinking about changing your career path? This Postgraduate Diploma will allow you to specialize in Hard Surface modeling.*

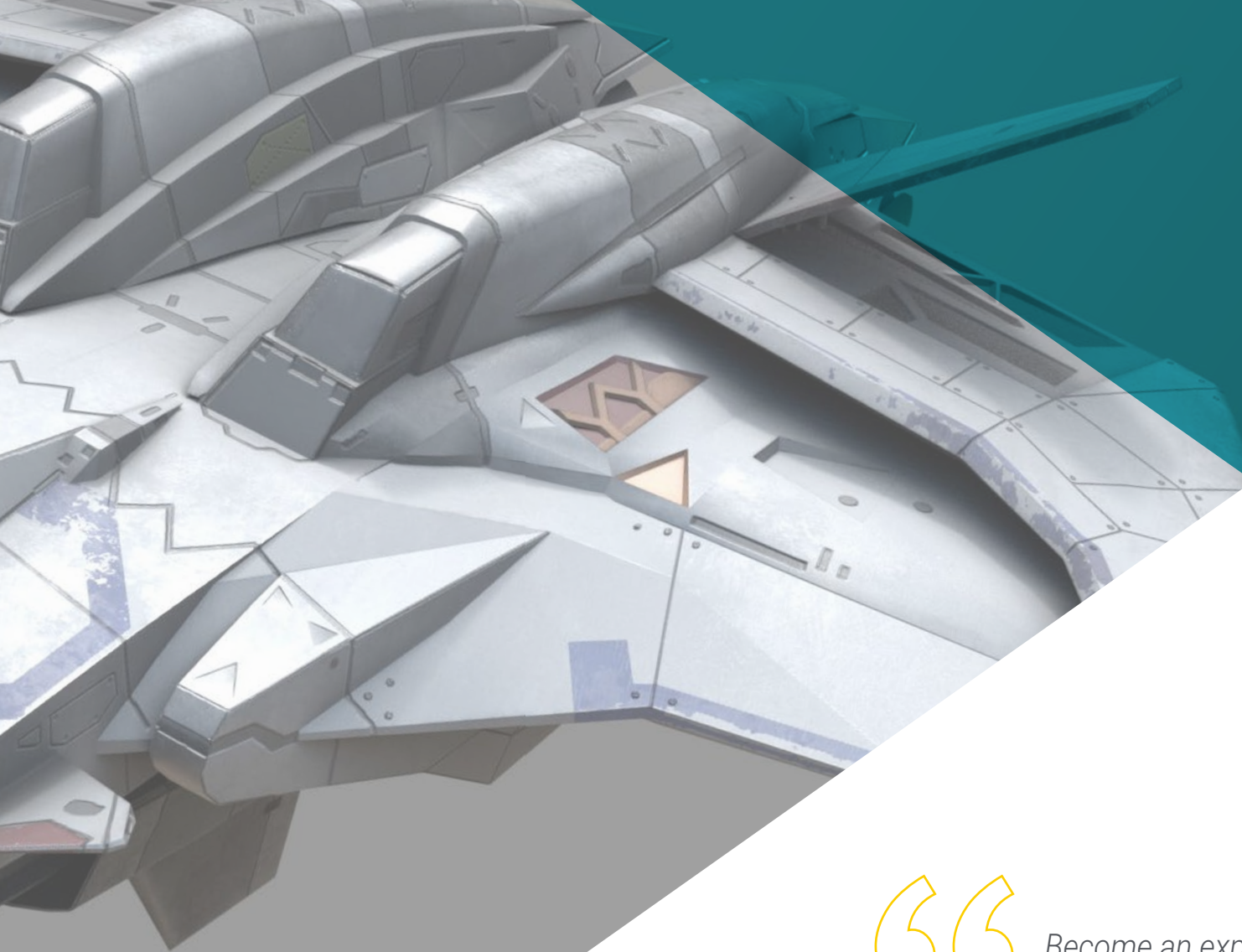


# 02 Objectives

This Postgraduate Diploma aims to turn the students into true technical experts in 3D *Hard Surface* modeling and to ensure that the professional projects they undertake are successfully completed. With the mastery of geometry and shapes, the modeling of any surface is achieved, identifying different mechanical components and applying transformations by means of symmetries. All this also includes practice with specific tools such as ZBrush.







“

*Become an expert in ZBrush with this Postgraduate Diploma, you will be able to create hyper-realistic effects to surfaces with the Hard Surface technique"*



## General Objectives

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- ◆ Learn in depth the different types of Hard surface modeling, the different concepts and features to apply them in the 3D modeling industry
- ◆ Delve into the theory of shape creation in order to develop shape masters
- ◆ Learn in detail the basics of 3D modeling in its different forms
- ◆ Generate designs for different industries and their application
- ◆ Be a technical expert and/or artist in 3D modeling for Hard surface
- ◆ Know all the tools involved in the 3D modeling profession
- ◆ Acquire skills for the development of textures and FX of 3D models



*This program is organized by objectives so that students can progressively enhance their knowledge"*





## Specific Objectives

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### Module 1. Study of Figure and Shape

- ◆ Conceive and apply constructions of geometric figures
- ◆ Understand the basics of three-dimensional geometry
- ◆ Knowing in detail how it is represented in technical drawing
- ◆ Identify different mechanical components
- ◆ Apply transformations through symmetries
- ◆ Develop an understanding of how shapes are developed
- ◆ Work through shape analysis

### Module 2. Hard Surface Modeling

- ◆ Understand in depth how to control the topology
- ◆ Develop function communication
- ◆ Have knowledge of the emergence of Hard Surface
- ◆ Have a detailed understanding of the different industries of its application
- ◆ Have a comprehensive understanding of the different types of modeling
- ◆ Possess valid information on the fields that make up modeling

### Module 3. Hard Surface Modeling for Characters

- ◆ How Sculpt modeling works
- ◆ Know extensively the tools that will make our performance
- ◆ Conceive what type of Sculpt will be developed on our model
- ◆ Understand how character props will play a role in our concept
- ◆ Learn in detail how to clean up meshes for export
- ◆ Presenting a Hard Surface character model

03

# Course Management

The teachers offered by TECH in all its degrees are professionals in their field with a long and consolidated trajectory, both in their professional performance as well as in teaching. This educational plan, in particular, has been designed by experts in three-dimensional modeling, texturing and rendering. Always focused on offering a professional and critical dimension to students, beyond theoretical and practical notions, so that they can take on new professional challenges without any problem.





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*The teachers of this Postgraduate Diploma are professionals in 3D modeling with a long and consolidated trajectory, both in their field and in teaching"*

## Management



### Mr. Salvo Bustos, Gabriel Agustín

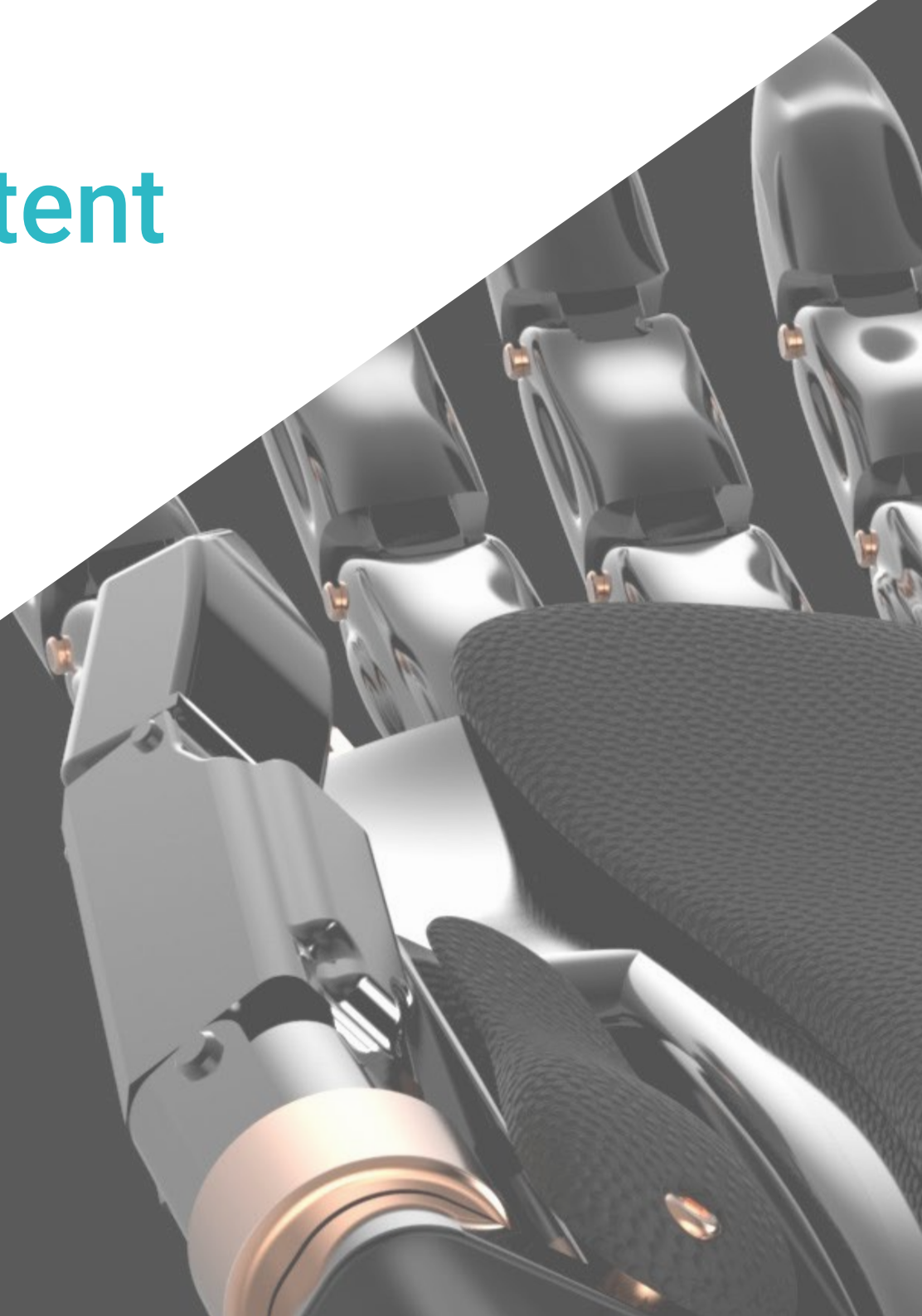
- ◆ 3D Artist at 3D VISUALIZATION SERVICE INC.
- ◆ 3D Production for Boston Whaler
- ◆ 3D Modeler at Shay Bonder Multimedia TV Production Company
- ◆ Audiovisual Producer at Digital Film
- ◆ Product Designer for Escencia de los Artesanos by Eliana M
- ◆ Industrial Designer Specializing in Products. National University of Cuyo
- ◆ Exhibitor at the Regional Visual Arts Salon Vendimia.
- ◆ Digital Composition Seminar. National University of Cuyo
- ◆ National Congress of design and production. C.P.R.O.D.I



# 04

## Structure and Content

This educational plan is organized in 3 main sections: the study of figure and shape, which delves into geometry and topology applied to modeling; *Hard Surface* modeling and *Hard Surface* modeling for characters. All the content is concentrated to ensure that students obtain hyper-realistic finishes in their modeling. The program offered by TECH Global University always covers a theoretical, practical and professional/critical dimension, in order to familiarize the students with the reality of their working field.







“

*Get a progressive learning, theoretical and practical, in Hard Surface modeling”*

## Module 1. Study of Figure and Shape

- 1.1. The Geometric Figure
  - 1.1.1. Types of Geometrical Figures
  - 1.1.2. Basic Geometric Constructions
  - 1.1.3. Geometric Transformations on the Plane
- 1.2. Polygons
  - 1.2.1. Triangles
  - 1.2.2. Quadrilaterals
  - 1.2.3. Regular Polygons
- 1.3. Axonometric System
  - 1.3.1. System Fundamentals
  - 1.3.2. Types of Orthogonal Axonometry
  - 1.3.3. Sketches
- 1.4. Three-Dimensional Drawing
  - 1.4.1. Perspective and Third Dimension
  - 1.4.2. Essential Elements of Drawing
  - 1.4.3. Perspectives
- 1.5. Technical Drawing
  - 1.5.1. Basic Notions
  - 1.5.2. Disposition of Views
  - 1.5.3. Cuts
- 1.6. Fundamentals of Mechanical Elements I
  - 1.6.1. Axes
  - 1.6.2. Joints and Bolts
  - 1.6.3. Springs
- 1.7. Fundamentals of Mechanical Elements II
  - 1.7.1. Bearings
  - 1.7.2. Gears
  - 1.7.3. Flexible Mechanical Elements
- 1.8. Laws of Symmetry
  - 1.8.1. Translation, Rotation, Reflection, Extension
  - 1.8.2. Touch, Overlay, Subtract, Intersect, Join
  - 1.8.3. Combined Laws

- 1.9. Form Analysis
  - 1.9.1. Form and Function
  - 1.9.2. Mechanical Form
  - 1.9.3. Types of Shapes
- 1.10. Topological Analysis
  - 1.10.1. Morphogenesis
  - 1.10.2. Composition
  - 1.10.3. Morphology and Topology

## Module 2. Hard Surface Modeling

- 2.1. Hard Surface Modeling
  - 2.1.1. Topology Control
  - 2.1.2. Function Communication
  - 2.1.3. Speed and Efficiency
- 2.2. Hard Surface I
  - 2.2.1. Hard Surface
  - 2.2.2. Development
  - 2.2.3. Structure
- 2.3. Hard Surface II
  - 2.3.1. Applications
  - 2.3.2. Physical Industry
  - 2.3.3. Virtual Industry
- 2.4. Types of Modeling
  - 2.4.1. Technical Modeling / Nurbs
  - 2.4.2. Polygonal Modeling
  - 2.4.3. Sculpt Modeling
- 2.5. Deep Hard Surface Modeling
  - 2.5.1. Profiles
  - 2.5.2. Topology and Edge Flow
  - 2.5.3. Mesh Resolution
- 2.6. Nurbs Modeling
  - 2.6.1. Dots, Lines, Polylines, Curves
  - 2.6.2. Surfaces
  - 2.6.3. 3D Geometry

- 2.7. Fundamentals of Polygonal Modeling
  - 2.7.1. Edit Poly
  - 2.7.2. Vertices, Edges, Polygons
  - 2.7.3. Surgery
- 2.8. Fundamentals of Sculpt Modeling
  - 2.8.1. Basic Geometry
  - 2.8.2. Subdivisions
  - 2.8.3. Deformities
- 2.9. Topology and Retopology
  - 2.9.1. High Poly and Low poly
  - 2.9.2. Polygonal Count
  - 2.9.3. Bake Maps
- 2.10. UV Maps
  - 2.10.1. UV Coordinates
  - 2.10.2. Techniques and Strategies
  - 2.10.3. Unwrapping

### Module 3. Hard Surface Modeling for Characters

- 3.1. ZBrush
  - 3.1.1. ZBrush
  - 3.1.2. Understanding the Interface
  - 3.1.3. Creating Some Meshes
- 3.2. Brushes and Sculpting
  - 3.2.1. Brushes Configurations
  - 3.2.2. Working with Alphas
  - 3.2.3. Standard Brushes
- 3.3. Tools
  - 3.3.1. Subdivision Levels
  - 3.3.2. Masks and Polygrups
  - 3.3.3. Tools and Techniques
- 3.4. Conception
  - 3.4.1. Dressing a Character
  - 3.4.2. Concept Analysis
  - 3.4.3. Rhythm

- 3.5. Initial Character Modeling
  - 3.5.1. The Torso
  - 3.5.2. The Arms
  - 3.5.3. Legs
- 3.6. Accessories
  - 3.6.1. Adding Belt
  - 3.6.2. The Hoof
  - 3.6.3. The Wings
- 3.7. Details of Accessories
  - 3.7.1. Hull Details
  - 3.7.2. Wing Details
  - 3.7.3. Shoulder Details
- 3.8. Body Details
  - 3.8.1. Torso Details
  - 3.8.2. Details on the Arms
  - 3.8.3. Leg Details
- 3.9. Cleaning
  - 3.9.1. Cleaning the Body
  - 3.9.2. Creating Sub-Tools
  - 3.9.3. Rebuilding Sub-Tools
- 3.10. Finalization
  - 3.10.1. Posing the Model
  - 3.10.2. Materials
  - 3.10.3. Rendering

“Enroll now and achieve this educational program comfortably. Become an expert in giving realism to the surfaces of your projects”

# 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 has been the most widely used learning system among the world's leading Information Technology 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.

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 course, students 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 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.



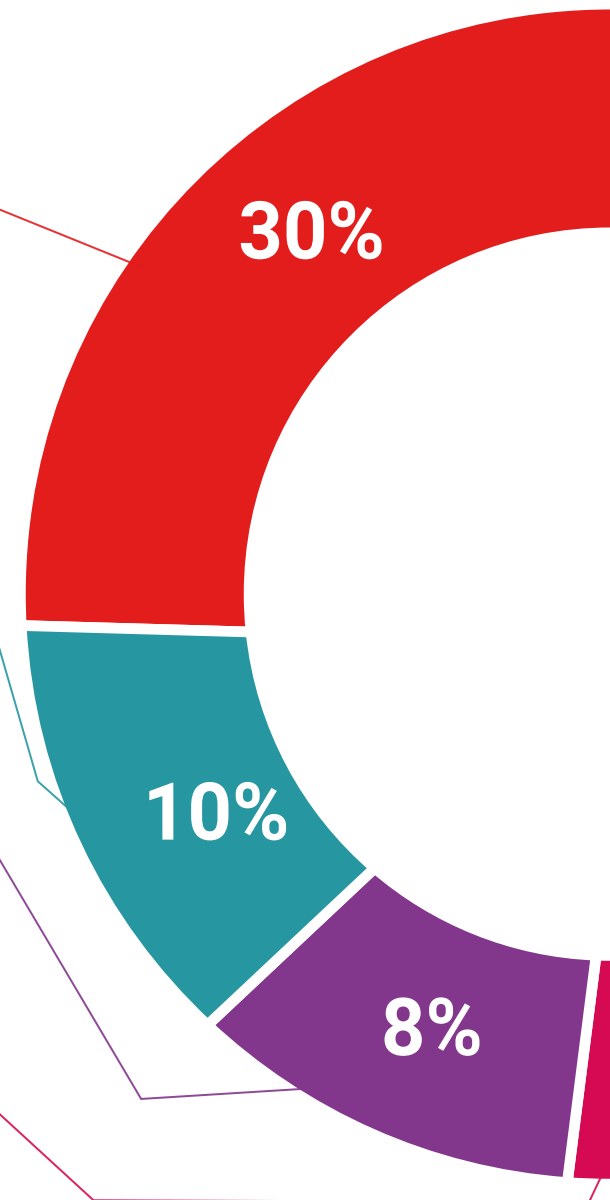
#### Practising Skills and Abilities

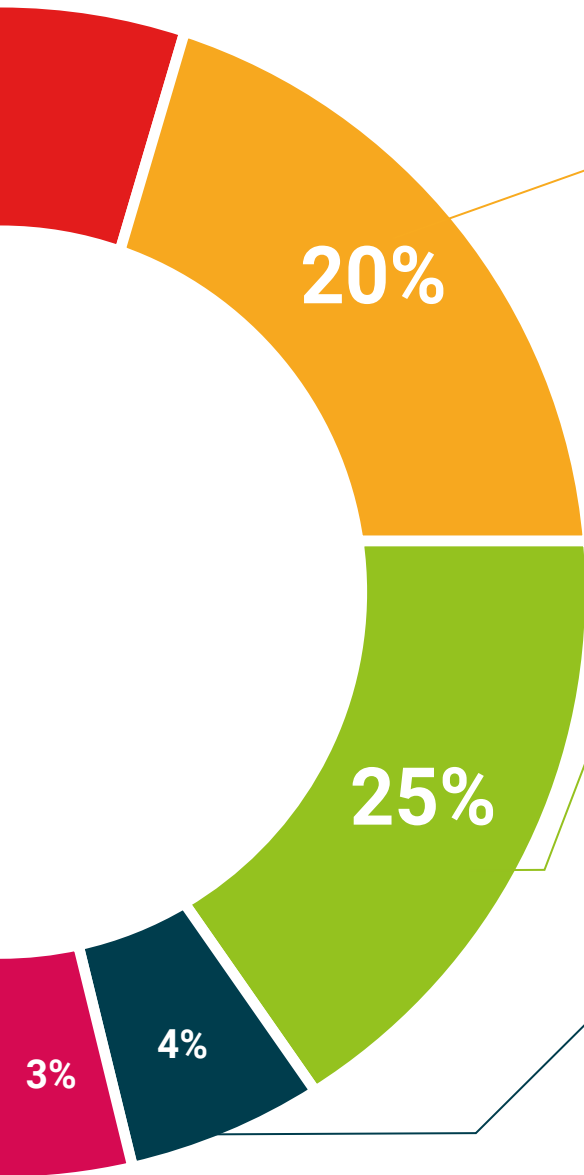
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



#### 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 Diploma in Hard Surface Modeling guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



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

This private qualification will allow you to obtain a **Postgraduate Diploma in Hard Surface Modeling** 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.

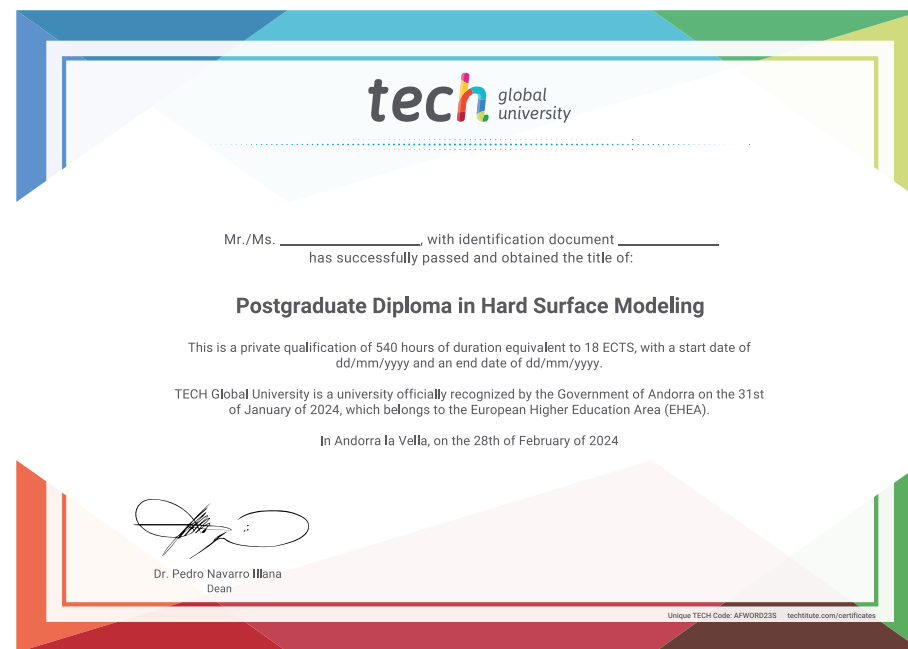
This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Diploma in Hard Surface Modeling**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**



future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present quality  
development language  
classroom



## Postgraduate Diploma Hard Surface Modeling

- » Modality: **online**
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