Postgraduate Certificate
Video Game Engines

tech technological university

tech technological university

Postgraduate Certificate

Video Game Engines

- Modality: **online**
- Duration: **12 weeks**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/in/video-games/postgraduate-certificate/video-games-engines**

Index

01

Introduction

Engines are the basic structure on which Video Games are programmed. It allows designers and developers to create animations and movements, and affects the playability of the work. Therefore, in essence, they are the skeleton of Video Games and a bad engine can mean their failure. That is why companies in the industry are looking for specialists who can create the best Engines on which to build the next successful Video Games. This program, therefore, offers its students the necessary knowledge to become great professionals who develop Video Game Engines in the best companies in the industry.

Develop the engines of the next successful video games thanks to this Postgraduate Certificate"

For Video Game fans, there are a number of elements that can be easily perceived and analyzed. These issues are mainly focused on their visual aspects. Therefore, they can appreciate the design, graphics or animations. But there is something without which all that could not be so valued, because it would not have the structure on which to settle: the Video Game Engines.

An engine includes the way the video game works, how the characters will move, what kind of scenarios they will be in, how the user participates and enjoys the game, and other elements related to its mechanics. Therefore, the engine is basic: without it there would be no great video games today.

For this reason, this Postgraduate Certificate in Videogame Engines is a great opportunity for students to become high-level professionals in the industry. This program provides the knowledge and skills necessary to develop Video Game Engines, so that students can make their way in the industry and progress to success.

This **Postgraduate Certificate in Video Game Engines** contains the most complete and up-to-date educational program on the market. The most important features include:

- Practical cases presented by experts in video game development
- 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
- Special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection work
- Content that is accessible from any fixed or portable device with an Internet connection

Companies are looking for specialists in video game engine development. Think no more and study this course with us"

Without good engines, video games wouldn't be successful. You will be essential to your company when you complete this"

The industry is expanding and needs great professionals like you.

Specialization is key for working in the field of video games.

The teaching staff of this program includes professionals from the industry, who contribute the experience of their work to this program, in addition to recognized specialists from reference 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 learning 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, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

Objectives

The main objective of this Postgraduate Certificate in Video Games Engines is to offer students the best specialized knowledge so that they can become experts in Video Game Engines development. By specializing in this important field, they will be able to access the best career opportunities in the industry. For this reason, this program is a great option for students, as they will be able to make their way in some of the most recognized companies in the world thanks to the knowledge they will gain.

TECH knows your objectives and will help you to achieve them"

General Objectives

- Understand the importance of Video Game Engines
- Become familiar with the field of programming as applied to this area
- Observe how Video Game Engines affect the proper or inadequate functioning of a video game
- Integrate engine operation with the rest of the elements of the video game

Your professional goals are very close thanks to this Postgraduate Certificate"

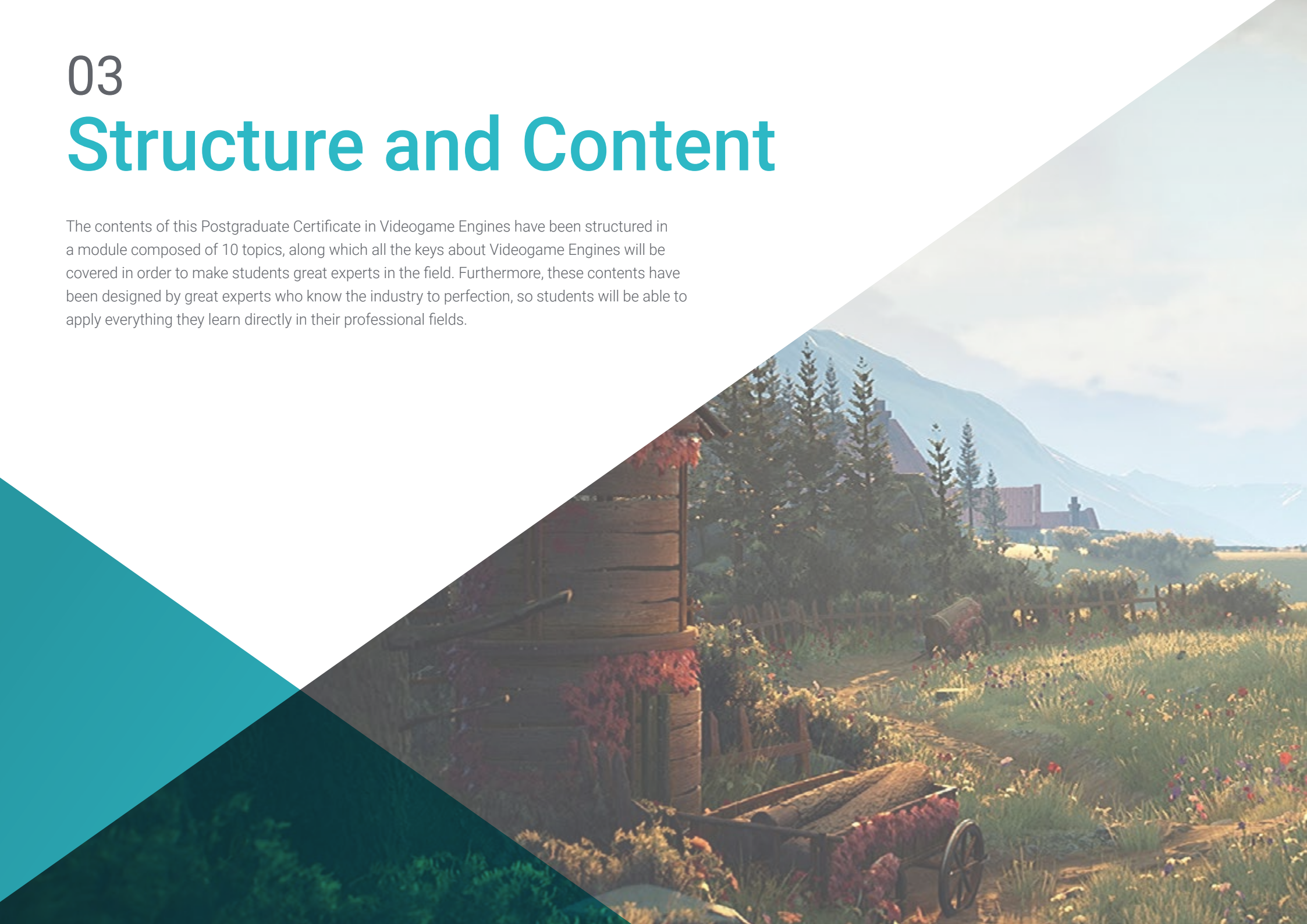
Specific Objectives

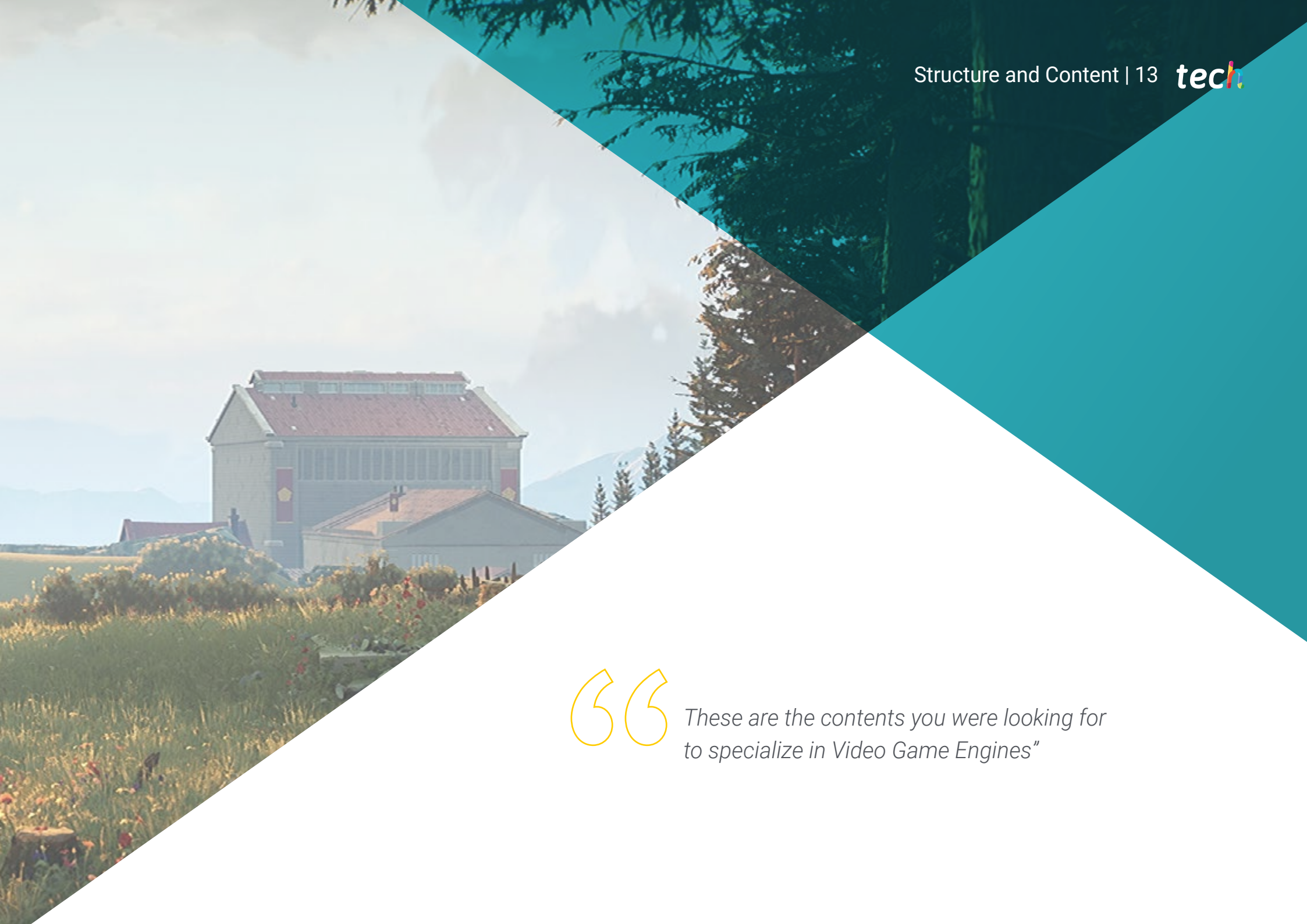
- Establish the technical specifications of the most commonly used graphics libraries in the creation of synthetic imaging
- Understand the basic principles of 2D and 3D imaging
- Assimilate image creation methods
- Apply visualization, animation, simulation and model interaction techniques
- Discover video game engine operation and architecture
- Understand the basic features of existing game engines
- Correctly and efficiently program applications applied to Video Game Engines
- Choose the most appropriate paradigm and programming languages to program applications applied to video game engines

03

Structure and Content

The contents of this Postgraduate Certificate in Videogame Engines have been structured in a module composed of 10 topics, along which all the keys about Videogame Engines will be covered in order to make students great experts in the field. Furthermore, these contents have been designed by great experts who know the industry to perfection, so students will be able to apply everything they learn directly in their professional fields.





These are the contents you were looking for to specialize in Video Game Engines"

Module 1. Computer Graphics

1.1. Computer Graphics Overview
- 1.1.1. Computer Graphics Applications and Uses
- 1.1.2. Computer Graphics History
- 1.1.3. Basic Algorithms for 2D Graphics
- 1.1.4. 3D Transformations: Projections and Perspectives

1.2. Mathematical and Physical Basis for Simulations and Textures
- 1.2.1. Light Rays
- 1.2.2. Absorption and Scattering
- 1.2.3. Specular and Diffuse Reflection
- 1.2.4. Color
- 1.2.5. Bidirectional Reflectance Distribution Function (BRDF) Color
- 1.2.6. Energy Conservation and Fresnel F0 Effect
- 1.2.7. Key Features of Physically Based Rendering (PBR)

1.3. Image Representation: Nature and Format
- 1.3.1. Introduction: Theoretical Basis
- 1.3.2. Size of the Digital Image: Resolution and Color
- 1.3.3. Uncompressed Image Formats
- 1.3.4. Compressed Image Formats
- 1.3.5. Color Spaces
- 1.3.6. Levels and Curves

1.4. Image Representation: Texture
- 1.4.1. Procedural Textures
- 1.4.2. Quixel Megascans: Scanning Textures
- 1.4.3. Texture Baking
- 1.4.4. Normal Mapping and Displacement
- 1.4.5. Albedo, Metallic and Roughness Maps

1.5. Rendering Scenes: Visualization and Lighting
- 1.5.1. Light Direction
- 1.5.2. Contrast
- 1.5.3. Saturation
- 1.5.4. Color
- 1.5.5. Direct and Indirect Light
- 1.5.6. Hard and Soft Light
- 1.5.7. Importance of Shading: Basic Rules and Types

1.6. Rendering Hardware Evolution and Performance
- 1.6.1. The 70's: The Advent of First 3D Modeling and Rendering Software
- 1.6.2. Architectural Orientation
- 1.6.3. The 90's: Development of Current 3D Software
- 1.6.4. 3D Printing
- 1.6.5. VR Equipment for 3D Visualization

1.7. 2D Graphics Software Analysis
- 1.7.1. Adobe Photoshop
- 1.7.2. Gimp
- 1.7.3. Krita
- 1.7.4. Inkscape
- 1.7.5. Pyxel Edit

1.8. 3D Modeling Software Analysis
- 1.8.1. Autodesk Maya
- 1.8.2. Cinema 4D
- 1.8.3. Blender
- 1.8.4. ZBrush
- 1.8.5. SketchUp
- 1.8.6. Computer-Aided Design (CAD) Software

1.9. 3D Texturing Software Analysis
- 1.9.1. Procedural Texturing in Maya
- 1.9.2. Procedural Texturing in Blender
- 1.9.3. Baking
- 1.9.4. Substance Painter and Substance Designer
- 1.9.5. ArmorPaint

1.10. 3D Texturing Software Analysis
- 1.10.1. Arnold
- 1.10.2. Cycles
- 1.10.3. Vray
- 1.10.4. IRay
- 1.10.5. Real-Time Rendering: Marmoset Toolbag

Module 2. Video Game Engines

2.1. Video Games and Information Communication Technologies (ICTs)
- 2.1.1. Introduction
- 2.1.2. Opportunities
- 2.1.3. Challenges
- 2.1.4. Conclusions

2.2. History of Video Game Engines
- 2.2.1. Introduction
- 2.2.2. Atari
- 2.2.3. The 80s
- 2.2.4. First Engines: The 90s
- 2.2.5. Current Engines

2.3. Video Game Engines
- 2.3.1. Types of Engines
- 2.3.2. Video Game Engine Parts
- 2.3.3. Current Engines
- 2.3.4. Selecting an Engine for Our Project

2.4. Motor Game Maker
- 2.4.1. Introduction
- 2.4.2. Scenarios Design
- 2.4.3. Sprites and Animations
- 2.4.4. Collisions
- 2.4.5. Scripting in Game Maker Languages (GML)

2.5. Unreal Engine 4: Introduction
- 2.5.1. What Is Unreal Engine 4? What Is Its Philosophy?
- 2.5.2. Materials
- 2.5.3. UI
- 2.5.4. Animations
- 2.5.5. Particle Systems
- 2.5.6. Artificial Intelligence
- 2.5.7. Frames Per Second (FPS)

2.6. Unreal Engine 4: Visual Scripting
- 2.6.1. Blueprints and Visual Scripting Philosophy
- 2.6.2. Debugging
- 2.6.3. Types of Variables
- 2.6.4. Basic Flow Control

2.7. Unity 5 Engine
- 2.7.1. C# and Visual Studio Programming
- 2.7.2. Creating Prefabs
- 2.7.3. Using Gizmos to Control Video Games
- 2.7.4. Adaptive Engine: 2D and 3D

2.8. Godot Engine
- 2.8.1. Godot Design Philosophy
- 2.8.2. Object- and Composition-Oriented Design
- 2.8.3. All in One Package
- 2.8.4. Open and Community-Driven Software

2.9. RPG Maker Engine
- 2.9.1. RPG Maker Philosophy
- 2.9.2. Taking as a Reference
- 2.9.3. Creating a Game with Personality
- 2.9.4. Commercially Successful Games

2.10. Source 2 Engine
- 2.10.1. Source 2 Philosophy
- 2.10.2. Source and Source 2: Evolution
- 2.10.3. Use of the Community: Audiovisual Content and Video Games
- 2.10.4. Future of Source 2 Engine
- 2.10.5. Successful Mods and Games

Learn everything about Video Game Engines and become a great expert"

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 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.

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. Over the course of 4 years, you will be presented with multiple practical case studies. You will have to combine all your knowledge, and research, argue, and defend your ideas and decisions.

Relearning Methodology

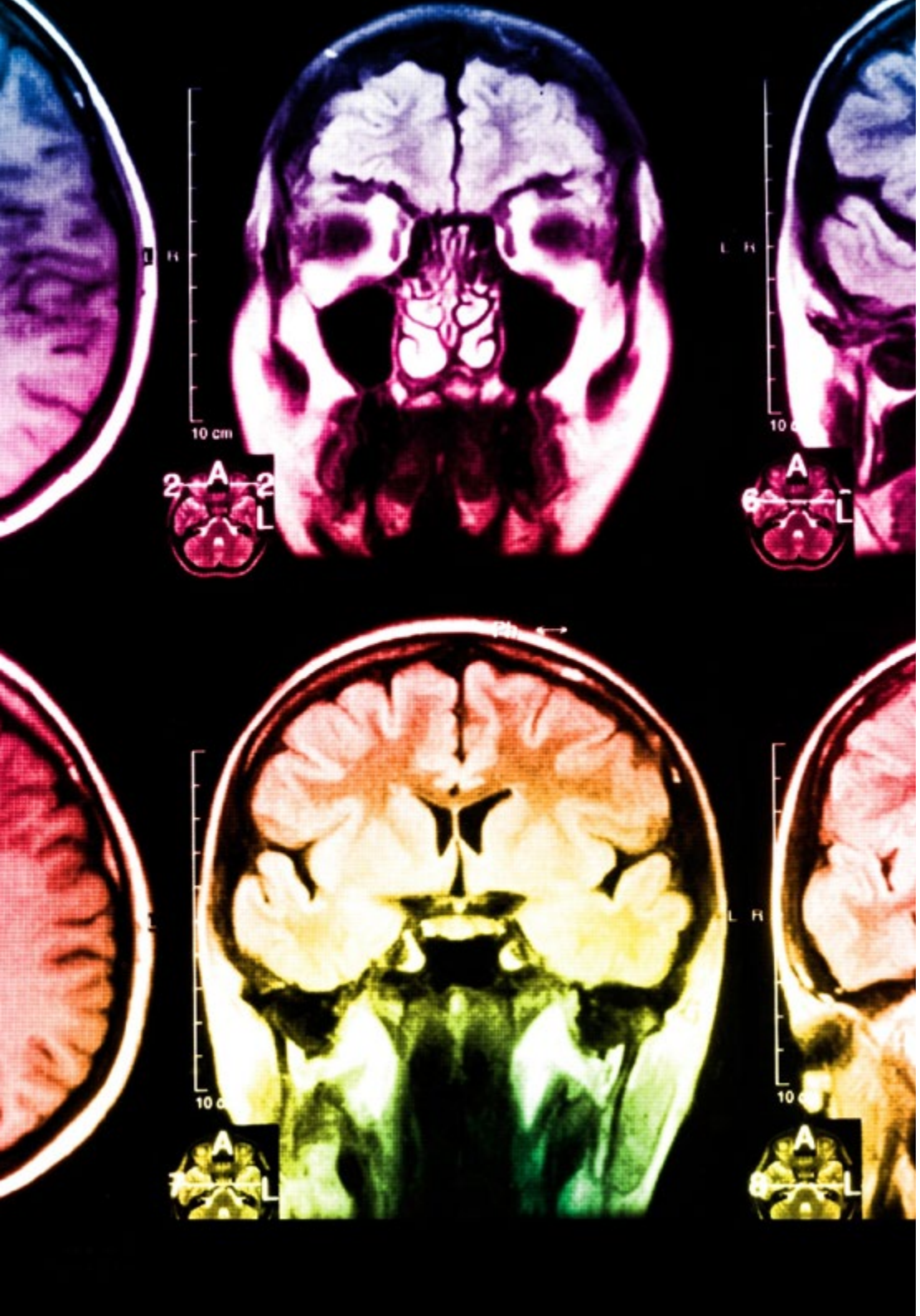
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

In 2019, we obtained the best learning results of all online universities in the world.

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.

Classes

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

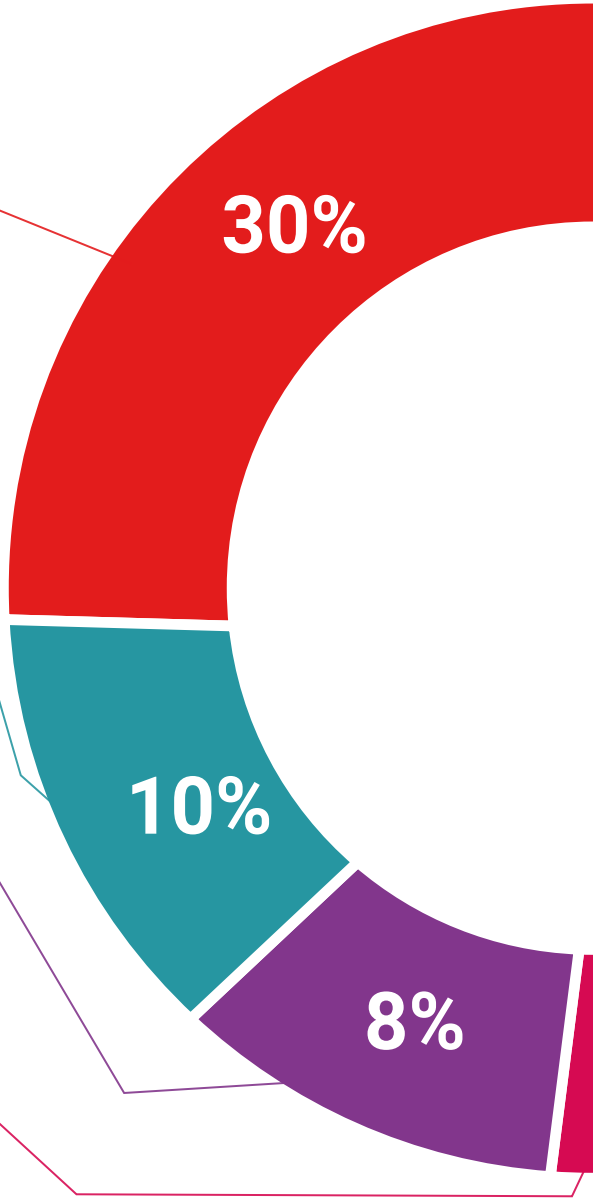
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

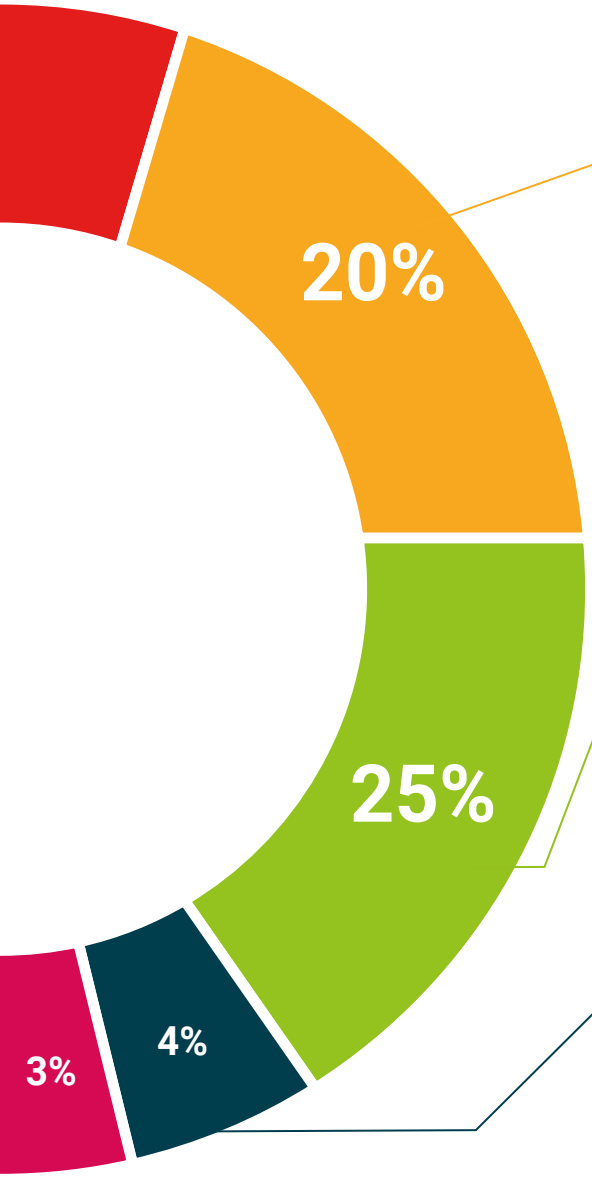
Practising Skills and Abilities

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

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 Certificate in Video Game Engines guarantees students, in addition to the most rigorous and up-to-date education, access to a qualification issued by TECH Technological University.

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

This **Postgraduate Certificate in Video Game Engines** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations and professional career evaluation committees.

Title: **Postgraduate Certificate in Video Game Engines**

Official Nº of Hours: **300 h.**


tech technological university

Awards the following

CERTIFICATE

to

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

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Video Game Engines

This is a qualification awarded by this University, equivalent to 300 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 certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

tech technological university

Postgraduate Certificate

Video Game Engines

- Modality: **online**
- Duration: **12 weeks**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Postgraduate Certificate
Video Game Engines

tech technological university