

Postgraduate Diploma 3D Art for Video Games





Postgraduate Diploma 3D Art for Video Games

Course Modality: **Online**

Duration: **6 months**

Certificate: **TECH Technological University**

Official N° of hours: **450 h.**

Website: www.techtute.com/us/videogames-design/postgraduate-diploma/postgraduate-diploma-3d-art-videogames

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01

Introduction

With the arrival of the next-gen consoles, 3D modeling became a fundamental discipline. As a result, no major new game is conceivable without a high-level 3D art department. However, there are not many professionals specialized in this area, so large companies in the industry are looking for talented people who can help them achieve their goals. For this reason, this program offers its students the knowledge and skills necessary to become experts in 3D art applied to video games, so that they can access a valuable position in companies in this industry.



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3D art is fundamental in the development of video games: specialize and achieve success in one of the big companies in the industry”

Of the latest innovations that have been established in the video game industry, one of the most important is the absolute integration of 3D art into the discipline. Although it has been a fairly important element for years, it is now absolutely essential, so much so that professionals specialized in this area are highly sought after.

For this reason, this Postgraduate Diploma in 3D Art for Video Games is the answer for all those industry workers and students who wish to guarantee a future in this sector, as it offers all the knowledge required to achieve success.

In this way, throughout this qualification, students will be able to learn everything about 3D art, modeling, design and computer graphics, so they will receive a complete, in-depth and comprehensive education which is totally focused on video games, and which will guarantee them access to large companies in the industry. Therefore, this 100% online program, which adapts to the different circumstances of its students, is the answer for all those who are looking to work in this sector but who still do not know how to achieve it.

This **Postgraduate Diploma in 3D Art for Video Games** contains the most complete and up-to-date educational program on the market. The most important features include:

- ◆ The development of practical cases presented by experts in 3D art applied to video games
- ◆ 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 assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



You will be an essential expert for your company”

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*You have talent and a lot of ideas:
enroll and succeed in the video
game industry”*

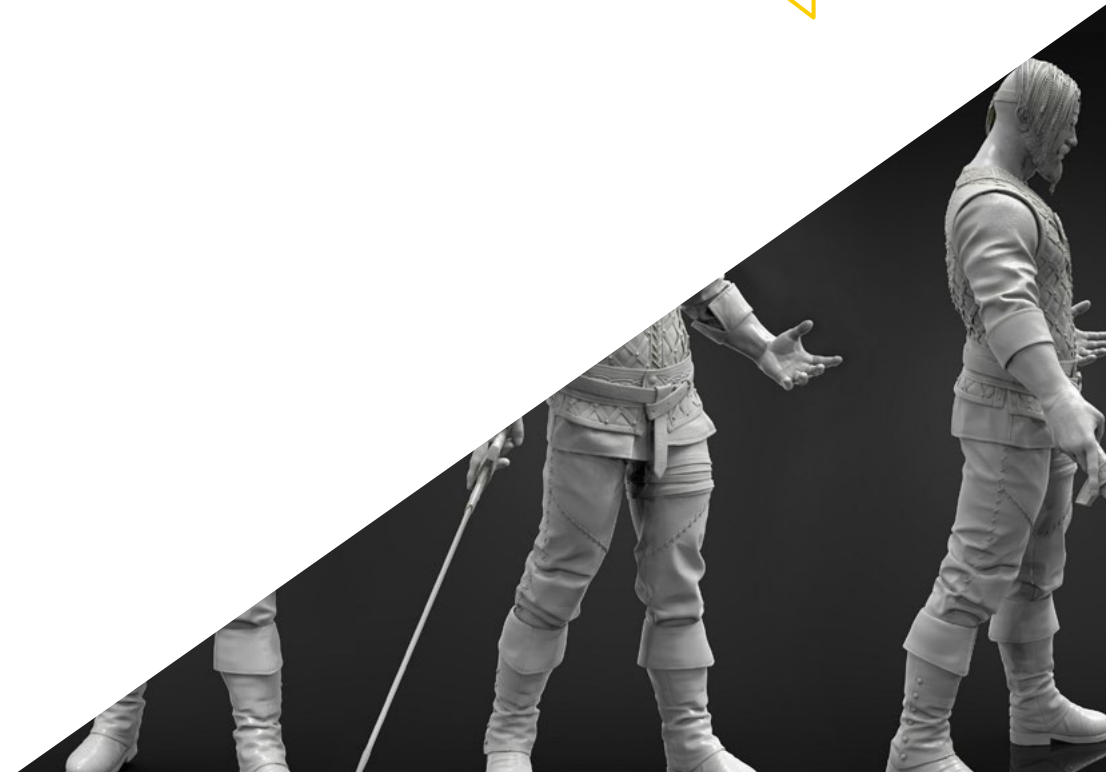
The program's teaching staff includes professionals from the sector who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

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 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. This will be done with the help of an innovative system of interactive videos made by renowned experts.

*The best video game companies
are waiting for you.*

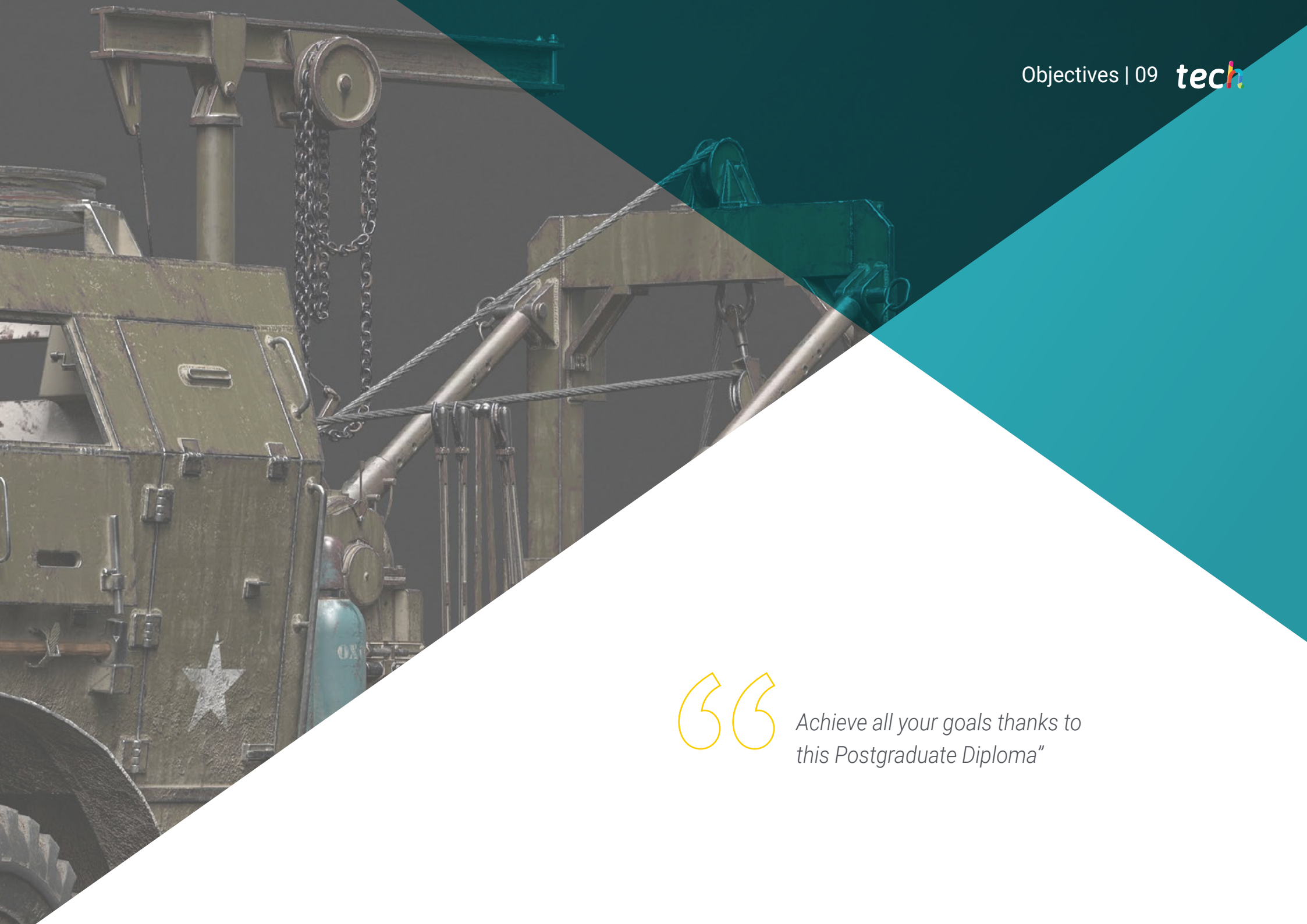
*3D Art for Video Games is a complex
and exciting discipline: don't wait any
longer and take this qualification.*



02 Objectives

The main objective of this Postgraduate Diploma in 3D Art for Video Games is to offer its students the best knowledge in this discipline so that they can be in a position to access positions in the 3D art department in the best companies in the industry. In this way, students know that pursuing this qualification with TECH is the key to success and their careers will take off quickly once they complete it.





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*Achieve all your goals thanks to
this Postgraduate Diploma”*



General objectives

- ◆ Observe the importance of computer graphics
- ◆ Gain knowledge about the different options available when creating this type of graphics
- ◆ Learn how to integrate these graphics into video games
- ◆ Master computer graphics creation software
- ◆ Introduce 3D in video games and its relevance in the industry
- ◆ Learn the efficient use of the main 3D modeling tools: Maya, Blender and Zbrush
- ◆ Specialize in 3D texturing with programs such as Substance Designer, Substance Painter and Substance Alchemist
- ◆ Understand the different rendering techniques and how to use them optimally



You will go far thanks to this qualification”





Specific objectives

Module 1. 3D Art

- ◆ Model and texturize 3D objects and characters
- ◆ Gain knowledge about the 3D Studio Max and Mudbox program interface for modeling objects and characters
- ◆ Understand the theory of 3D modeling
- ◆ Be able to extract textures
- ◆ Get to know how 3D cameras work

Module 2. 3D Design

- ◆ Analyze the history of 3D on computers and how it was implemented in video games
- ◆ Delve into the philosophy of the different modeling programs and the projects that can be carried out with them
- ◆ Differentiate 3D texturing software and under what circumstances to use each one
- ◆ Gain in-depth knowledge about all rendering techniques and the different processes to optimize them

Module 3. Computer Graphics

- ◆ Establish the technical specifications of the most commonly used graphic libraries for the creation of synthetic images
- ◆ Understand the basic principles of 2D and 3D imaging
- ◆ Assimilate image creation methods
- ◆ Apply visualization, animation, simulation and interaction techniques to models

03

Structure and Content

This Postgraduate Diploma in 3D Art for Video Games offers its students the best content so that they can apply them later in their professional careers. For that reason, they have been designed with an eminently practical approach, so that students are fully prepared to face all kinds of challenges in the field of 3D design, a delicate and complex issue to which companies in the industry pay special attention.





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*You won't find better content on 3D
Art applied to Video Games”*

Module 1. 3D Art

- 1.1. Advanced Art
 - 1.1.1. From Concept Art to 3D
 - 1.1.2. 3D Model Principles
 - 1.1.3. Modeling types: Organic / Inorganic
- 1.2. 3D Max Interface
 - 1.2.1. 3D Max Software
 - 1.2.2. Basic Interface
 - 1.2.3. Scene Organization
- 1.3. Inorganic Modeling
 - 1.3.1. Modeling with Primitives and Deformers
 - 1.3.2. Editable Polygon Modeling
 - 1.3.3. Modeling with Graphite
- 1.4. Organic Model
 - 1.4.1. Character Modeling I
 - 1.4.2. Character Modeling II
 - 1.4.3. Character Modeling III
- 1.5. Creation of UVs
 - 1.5.1. Basic Materials and Maps
 - 1.5.2. Unwrapping and Texture Projections
 - 1.5.3. Retopology
- 1.6. Advanced 3D
 - 1.6.1. Creation of Texture Atlas
 - 1.6.2. Hierarchies and Bone Creation
 - 1.6.3. Application of a Skeleton
- 1.7. Animation Systems
 - 1.7.1. Biped
 - 1.7.2. CAT
 - 1.7.3. Own Rigging
- 1.8. Facial Rigging
 - 1.8.1. Expressions
 - 1.8.2. Restrictions
 - 1.8.3. Controllers
- 1.9. Principles of Animation
 - 1.9.1. Cycles
 - 1.9.2. Libraries and Use of MoCap Motion Capture Files
 - 1.9.3. Motion Mixer
- 1.10. Export to Engines
 - 1.10.1. Export to Unity Engine
 - 1.10.2. Models Export
 - 1.10.3. Animation Export

Module 2. 3D Design

- 2.1. 3D in Video Games, Why is it Important?
 - 2.1.1. History of Computer 3D
 - 2.1.2. Implementation of 3D in Video Games
 - 2.1.3. Techniques for 3D Optimization in Video Games
 - 2.1.4. Interaction between Graphics Software and Game Engines
- 2.2. 3D Modeling: Maya
 - 2.2.1. Maya's Philosophy
 - 2.2.2. Maya's Capabilities
 - 2.2.3. Projects Carried out with Autodesk Maya
 - 2.2.4. Introduction to Modeling Tools, Rigging, Texturing, etc.
- 2.3. 3D Modeling: Blender
 - 2.3.1. Blender's Philosophy
 - 2.3.2. Past, Present and Future
 - 2.3.3. Projects Made with Blender
 - 2.3.4. Blender Cloud
 - 2.3.5. Introduction to Modeling Tools, Rigging, Texturing, etc.
- 2.4. 3D Modeling: Zbrush
 - 2.4.1. Zbrush's Philosophy
 - 2.4.2. Integration of Zbrush into a Production Pipeline
 - 2.4.3. Advantages and Disadvantages Compared to Blender
 - 2.4.4. Analysis of Designs Made in ZBrush
- 2.5. 3D Texturing: Substance Designer
 - 2.5.1. Introduction to Substance Designer
 - 2.5.2. Substance Designer's Philosophy
 - 2.5.3. Substance Designer in Video Game Production
 - 2.5.4. Substance Designer and Substance Painter Interaction
- 2.6. 3D Texturing: Substance Painter
 - 2.6.1. What is Substance Painter Used For?
 - 2.6.2. Substance Painter and its Standardization
 - 2.6.3. Substance Painter in Stylized Texturing
 - 2.6.4. Substance Painter in Realistic Texturing
 - 2.6.5. Analysis of Textured Models
- 2.7. 3D Texturing: Substance Alchemist
 - 2.7.1. What is Substance Alchemist?
 - 2.7.2. Workflow of Substance Alchemist
 - 2.7.3. Alternatives to Substance Alchemist
 - 2.7.4. Examples of Projects
- 2.8. Rendering: Texture Mapping and Baking
 - 2.8.1. Introduction to Texture Mapping
 - 2.8.2. UV Mapping
 - 2.8.3. Optimization of UV
 - 2.8.4. UDIMs
 - 2.8.5. Integration with Texturing Software
- 2.9. Rendering: Advanced lighting
 - 2.9.1. Lighting Techniques
 - 2.9.2. Contrast Balance
 - 2.9.3. Color Balance
 - 2.9.4. Lighting in Video Games
 - 2.9.5. Resource Optimization
 - 2.9.6. Pre-Rendered Lighting vs. Real-Time Lighting
- 2.10. Rendering: Scenes, Render Layers and Passes
 - 2.10.1. Use of Scenes
 - 2.10.2. Utility of Render Layers
 - 2.10.3. Utility of the Passes
 - 2.10.4. Integration of Passes in Photoshop

Module 3. Computer Graphics

- 3.1. Computer Graphics Overview
 - 3.1.1. Computer Graphics Applications and Uses
 - 3.1.2. Computer Graphics History
 - 3.1.3. Basic Algorithms for 2D Graphics
 - 3.1.4. 3D Transformations: Projections and Perspectives
- 3.2. Mathematical and Physical Basis for Simulations and Textures
 - 3.2.1. Light Rays
 - 3.2.2. Absorption and Scattering
 - 3.2.3. Specular and Diffuse Reflection
 - 3.2.4. Color
 - 3.2.5. Bidirectional Reflectance Distribution Function (BRDF) Color
 - 3.2.6. Energy Conservation and Fresnel F0 Effect
 - 3.2.7. Key Features of Physically Based Rendering (PBR)
- 3.3. Image Representation: Nature and Format
 - 3.3.1. Presentation: Theoretical Foundation
 - 3.3.2. Digital Image Size: Color and Resolution
 - 3.3.3. Uncompressed Image Formats
 - 3.3.4. Compressed Image Formats
 - 3.3.5. Color Spaces
 - 3.3.6. Levels and Curves
- 3.4. Image Representation Textures
 - 3.4.1. Procedural Textures
 - 3.4.2. Quixel Megascans: Scanning Textures
 - 3.4.2. Texture Baking
 - 3.4.3. Normal Mapping and Displacement
 - 3.4.4. Albedo, Metallic and Roughness Maps
- 3.5. Scene Rendering: Display and Lighting
 - 3.5.1. Light Direction
 - 3.5.2. Contrast
 - 3.5.3. Saturation
 - 3.5.4. Color
 - 3.5.5. Direct and Indirect Light
 - 3.5.6. Hard and Soft Light
 - 3.5.7. Shadows: Basic Rules and Types
- 3.6. Rendering Hardware Evolution and Performance
 - 3.6.1. The 1970s: The Advent of First 3D Modeling and Rendering Software
 - 3.6.2. Architectural Orientation
 - 3.6.3. The 1990s: Current 3D Software Development
 - 3.6.4. 3D Printing
 - 3.6.5. VR Equipment for 3D Visualization
- 3.7. 2D Graphics Software Analysis
 - 3.7.1. Adobe Photoshop
 - 3.7.2. Gimp
 - 3.7.3. Krita
 - 3.7.4. Inkscape
 - 3.7.5. Pyxel Edit
- 3.8. 3D Modeling Software Analysis
 - 3.8.1. Autodesk Maya
 - 3.8.2. Cinema 4D
 - 3.8.3. Blender
 - 3.8.4. Zbrush
 - 3.8.5. SketchUp
 - 3.8.6. Computer-Aided Design (CAD) Software
- 3.9. 3D Texturing Software Analysis
 - 3.9.1. Procedural Texturing in Maya
 - 3.9.2. Procedural Texturing in Blender
 - 3.9.3. Baking
 - 3.9.4. Substance Painter and Substance Designer
 - 3.9.5. ArmorPaint
- 3.10. 3D Texturing Software Analysis
 - 3.10.1. Arnold
 - 3.10.2. Cycles
 - 3.10.3. Vray
 - 3.10.4. IRay
 - 3.10.5. Real-Time Rendering: Marmoset Toolbag



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.





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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.

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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.



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

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 Diploma in 3D Art for Video Games guarantees you, in addition to the most rigorous and up-to-date training, access to a Postgraduate Diploma issued by TECH Technological University.



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*Successfully complete this program
and receive your university degree
without travel or laborious paperwork”*

This **Postgraduate Diploma in 3D Art for Video Games** 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 Diploma** issued by **TECH Technological University** via tracked delivery*.

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

Title: **Postgraduate Diploma in 3D Art for Video Games**

Official N° of hours: **450 h.**



*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.

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



Postgraduate Diploma 3D Art for Video Games

Course Modality: **Online**

Duration: **6 months**

Certificate: **TECH Technological University**

Official N° of hours: **450 h.**

Postgraduate Diploma 3D Art for Video Games

