

# Postgraduate Certificate Computer Graphics





## Postgraduate Certificate Computer Graphics

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

Website: [www.techtitute.com/in/videogames/postgraduate-certificate/computer-graphics](http://www.techtitute.com/in/videogames/postgraduate-certificate/computer-graphics)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Structure and Content

---

*p. 12*

04

Methodology

---

*p. 16*

05

Certificate

---

*p. 24*

# 01

# Introduction

The visual aspect of a video game involves a series of elements that are often referred to as graphics. The graphics are the basic aesthetics component of the game. That is why they are so important and why companies need great specialists to develop their best projects. This program offers its students the best content to become experts in graphics creation, so that they can access the best professional positions in the video game industry.



“

*Design the best graphics for the  
best video games of the year”*

Computer graphics are one of the basic elements that make up a video game. The most essential visual issues depend on them, so they are a vitally important aspect when designing a video game. But, precisely because of their importance, they require a very high level of specialization, and it is not easy for companies to find qualified personnel to meet their objectives.

Therefore, this area represents a great opportunity for all those professionals who wish to enter the video game industry, since experts in graphics design are currently in demand. For that reason, this Postgraduate Certificate in Computer Graphics is a great option for students, as it will give them access to large companies in the sector immediately.

This program offers a 100% online learning process, designed in such a way that it can be adapted to its students, as it emphasizes flexibility so that they can combine their studies with their professional careers. It has complete and in-depth contents, and has everything necessary to make the students highly successful professionals, making it the best program that exists on video game graphics.

This **Postgraduate Certificate in Computer Graphics** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ Practical cases presented by experts in Video Game Design
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the creation of computer graphics applied to video games
- ◆ 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



*Become an expert in the design of Computer Graphics for video games with this Postgraduate Certificate”*

“

*Learn all about Computer Graphics and get access to the best positions in your company”*

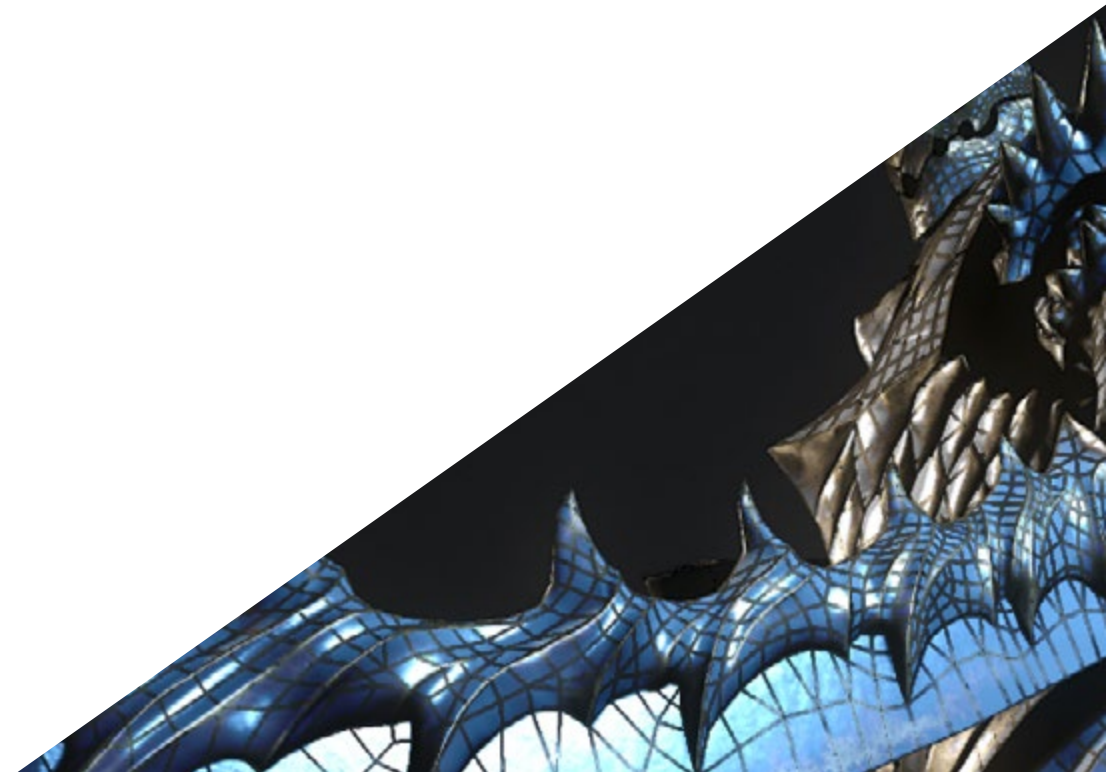
The program's teaching staff includes professionals from the sector who contribute the experience of their work to this program, as well as renowned specialists from reference societies and prestigious universities.

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.

*You will participate in the biggest successful video games of the future.*

*You will gain access to the best positions in the industry.*



# 02 Objectives

This Postgraduate Certificate in Computer Graphics offers its students the best contents in the design and creation of Computer Graphics applied to video games. Thanks to it, students will be able to acquire the best skills and knowledge in the field, gaining great job opportunities in the industry and achieving professional success. Therefore, students will have everything to succeed in their careers with this program, making it the best option to establish themselves in this currently popular sector.







“

*Achieve all your professional goals  
with this Postgraduate Certificate”*



## General Objectives

---

- ◆ Observe the importance of Computer Graphics
- ◆ Know the different options available when creating this type of graphics
- ◆ Learn how to integrate these graphics into video games
- ◆ Gain proficiency in computer graphics software

“

*You are ambitious  
and this program will  
help you go far”*





## Specific Objectives

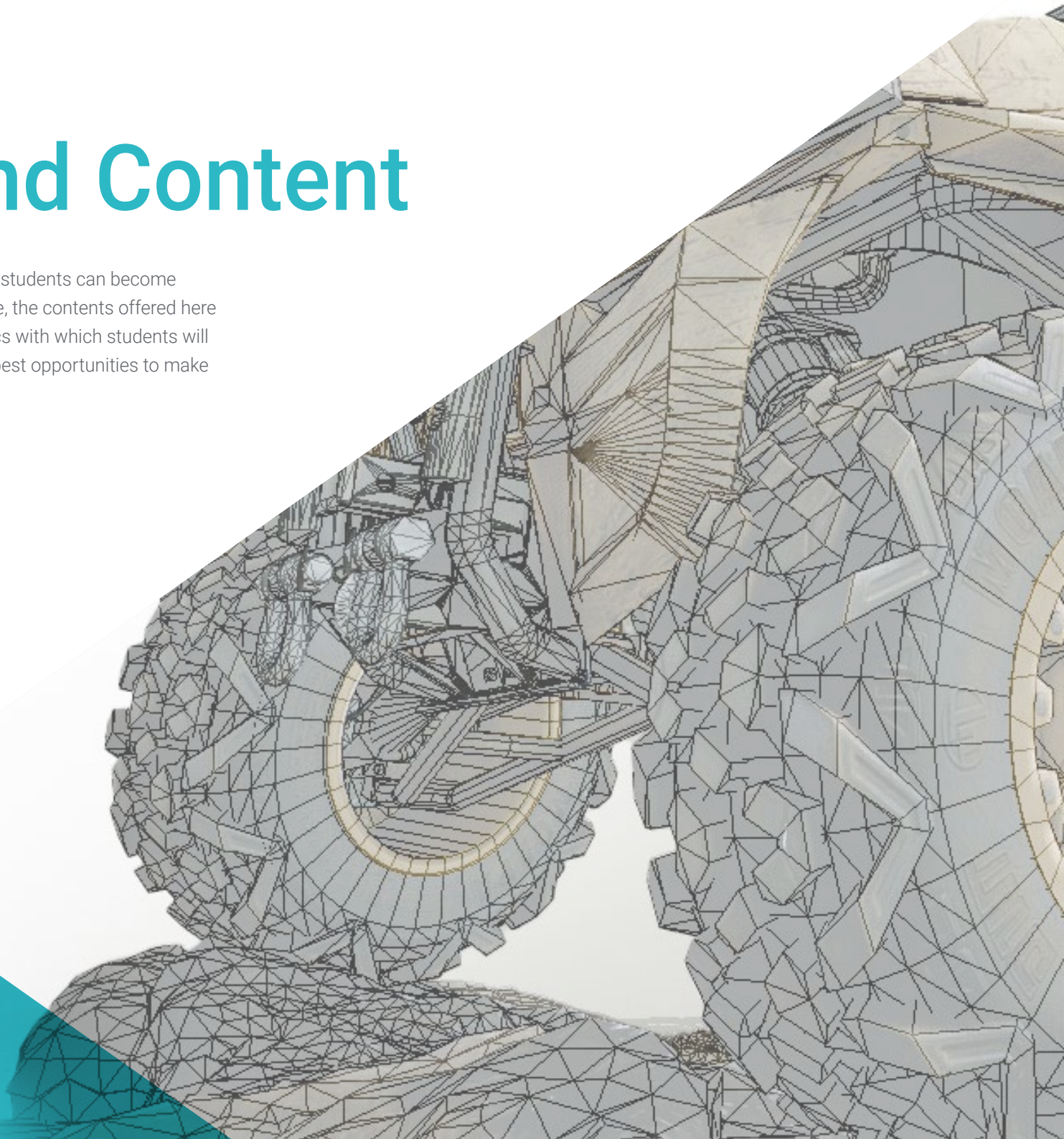
---

- ◆ 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

03

# Structure and Content

The contents of this program have been designed so that students can become experts in Computer Graphics upon completion. Therefore, the contents offered here have been structured into a module composed of 10 topics with which students will learn everything about the subject, thereby obtaining the best opportunities to make their way in this exciting industry with so much future.





“

*Create the best graphics for video games thanks to this program”*

## 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. Digital Image Size: Color and Resolution
  - 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 Textures
  - 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. Scene Rendering: Display 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. Shadows: Basic Rules and Types
- 1.6. Rendering Hardware Evolution and Performance
  - 1.6.1. The 1970s: The Advent of First 3D Modeling and Rendering Software
  - 1.6.2. Architectural Orientation
  - 1.6.3. The 1990s: Current 3D Software Development
  - 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



*You won't find better content to specialize in the subject"*

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 Computer Graphics guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate 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 Computer Graphics** 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 Computer Graphics**

Official N° of hours: **150 h.**



\*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.

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 Certificate Computer Graphics

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

# Postgraduate Certificate Computer Graphics

