

# Postgraduate Certificate

## Advanced Video Game Programming





## Postgraduate Certificate Advanced Video Game Programming

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

Website: [www.techtute.com/us/design/postgraduate-certificate/advanced-video-game-programming](http://www.techtute.com/us/design/postgraduate-certificate/advanced-video-game-programming)

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Certificate

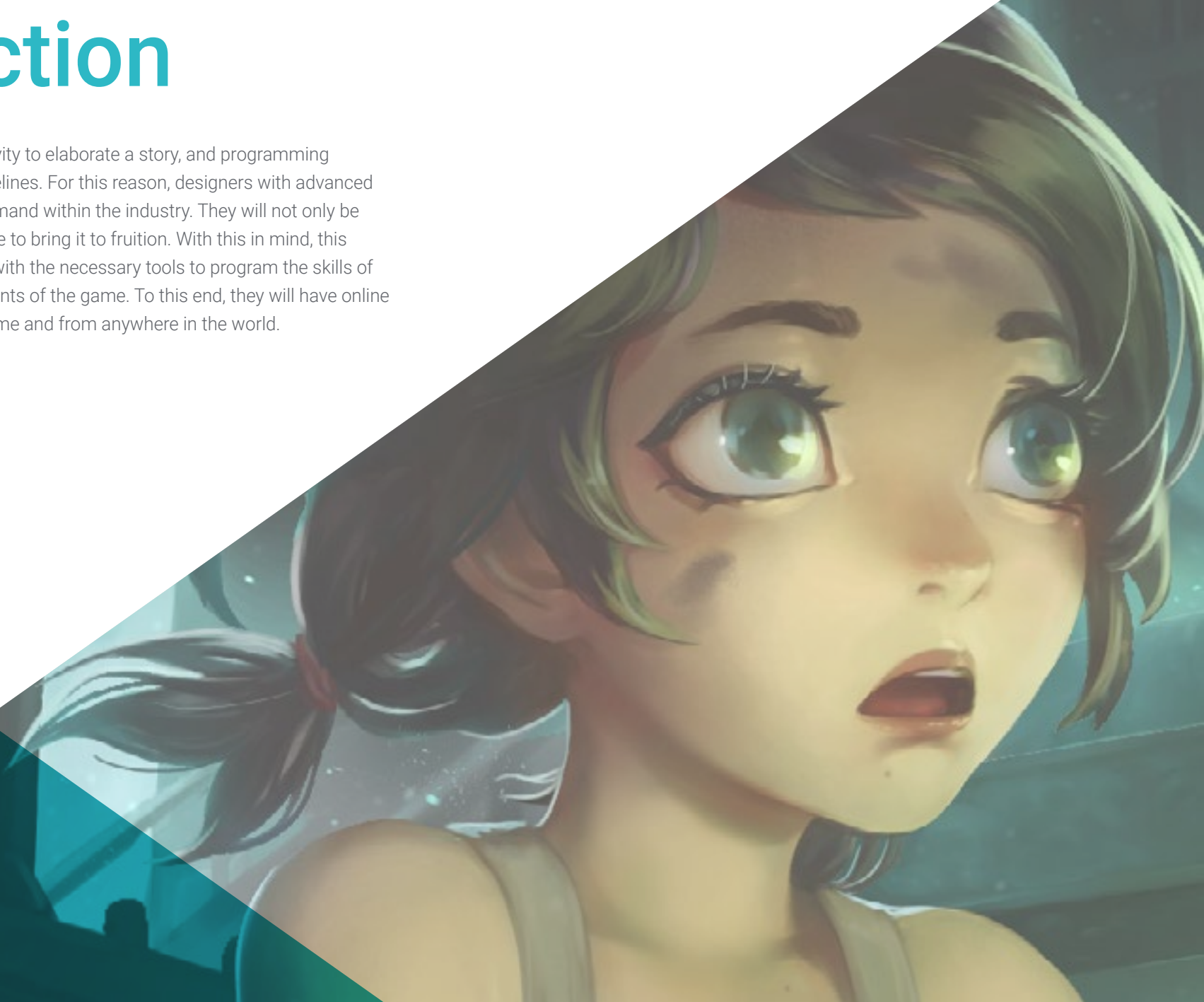
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# 01

# Introduction

Creating a video game requires creativity to elaborate a story, and programming skills to follow the design team's guidelines. For this reason, designers with advanced knowledge in this area are in great demand within the industry. They will not only be able to design a game, but also be able to bring it to fruition. With this in mind, this program aims to provide the student with the necessary tools to program the skills of the characters and the different elements of the game. To this end, they will have online content that they can access at any time and from anywhere in the world.





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*Without programmers there would be no video games. Specialize in this area by enrolling in this program"*

There are different teams involved in the design of a videogame. Each of them specializes in one area. The art team oversees the aesthetics and visibility of the environments; the sound team is in charge of the soundtrack and effects; the creative team is in charge of the story and script. They all work on tangible aspects of video games, but it is thanks to developers that all these areas can be integrated into a solid scene or novel gameplay.

Video game programming is, therefore, a complex field that requires advanced skills and knowledge to ensure excellence in the work. That is why companies in the industry are always looking for professionals in the field. As such, this Postgraduate Certificate has all the tools that the student may require to specialize in the sector.

So, the concepts presented go far beyond knowing how to program in Unity 3D or how to create characters and animations. With this program, advanced knowledge is provided, whereby students can program the artificial intelligence of opponents and NPCs so that they learn and respond according to the player's decisions.

All this will be available from anywhere in the world, thanks to the online modality of the Postgraduate Certificate. In addition, there is a direct qualification, and therefore no final project must be presented to obtain the qualification, thereby allowing students to start implementing what they have learned immediately.

This **Postgraduate Certificate in Advanced Video Game Programming** contains a complete educational program especially designed for those students who want to dedicate themselves to the development of video games. Its most notable features are:

- ◆ The practical exercises, with which students can learn advanced programming for video games
- ◆ A high-level teaching staff ready to offer their best tricks to the students
- ◆ The dynamic and flexible approach, with which learners will be able to carry out a process of self-evaluation to improve their learning
- ◆ Access to content from any fixed or portable device with an Internet connection



*In just a few weeks you will learn what many take years to learn. All this with a 100% online program"*

“ *Big companies need designers specialized in programming to develop new video games* ”

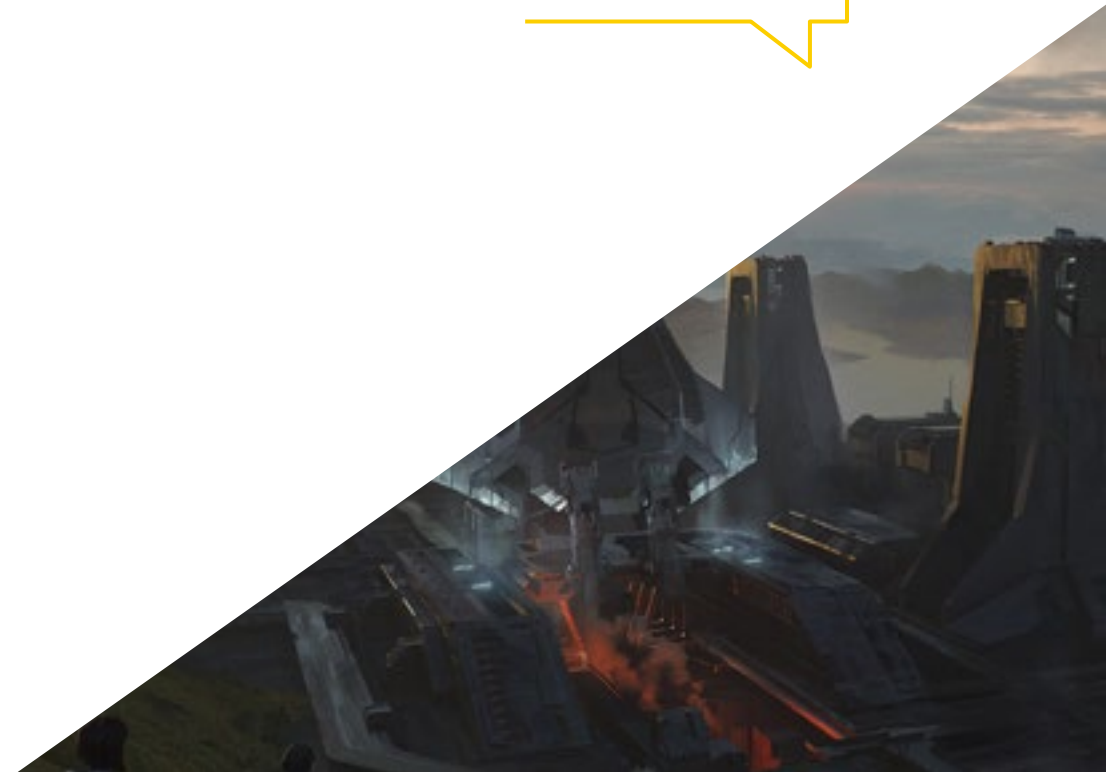
The program's teaching staff includes professionals from sector who contribute their work experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

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 immersion training programmed to train 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.

*Programming a video game as a designer will allow you to attract new professional opportunities.*

*Want to enter the world of video games? This degree will help you achieve it.*





# 02 Objectives

The main objective of this Postgraduate Certificate focuses on providing students with the tools and knowledge they need to train as programmers. The contents are, therefore, designed to guarantee advanced specialization in the area, allowing students to improve their professional profile for the working and professional world. That is why they are provided with a fully online program and an innovative teaching methodology.





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*Specialization in programming is necessary for designers looking to improve their professional profile"*



## General Objectives

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- ◆ Perform professional programming with the Unity 3D engine
- ◆ Know the different genres of video games, the concept of gameplay and features in order to apply them in the analysis of video games and in the creation of the design of the video game
- ◆ Deepen understanding of the production of video games and in the SCRUM methodology for project production
- ◆ Learn the fundamentals of video game design and the theoretical knowledge that a video game designer should know







## Specific Objectives

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- ◆ Learn how to perform advanced programming
- ◆ Design 3D characters and environments
- ◆ Program different Gameplays, environment puzzles and level objects
- ◆ Create different game elements and program player skills such as jump, run, shoot or hide
- ◆ Create a computer game

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*Transform your passion for video games into your profession"*

# 03

# Course Management

The teaching staff of this program will teach students all the keys to advanced programming applied to video games. Thanks to their experience, students will be able to learn first-hand what is needed in the video game industry and make their way in the labor market. Also, their professional achievements within the industry make them the best team to guide the careers of designers who wish to venture into this area.





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*You will be supported by experts in video game development to bring the characters to life through programming code”*

## Management



### Mr. Blasco Vilches, Luis Felipe

- ♦ Narrative designer at Stage Clear Studios, developing a confidential product
- ♦ Narrative designer at HeYou Games in the “Youturbo” project
- ♦ E-learning and serious games product designer and scriptwriter for Telefónica Learning Services, TAK and Bizpills
- ♦ Level designer at Indigo for the “Meatball Marathon” project
- ♦ Screenwriting teacher in the Master’s Degree in Video Game Creation at the University of Malaga
- ♦ Lecturer in Video Game Narrative Design and Production at the TAI Film Department, Madrid
- ♦ Narrative Design and Script Workshops teacher, and in the Video Game Design Degree at ESCAV, Granada
- ♦ Degree in Hispanic Studies from the University of Granada, Spain
- ♦ Master’s Degree in Creativity and Television Screenwriting, Rey Juan Carlos University





## Professors

### Mr. Carpintero Rodríguez, Eduardo

- ◆ Developer of video games and interactive environments
- ◆ Master's Degree in Video Game Development IVisual
- ◆ Degree in Web Application Development IES Ribera de Castilla
- ◆ Degree in Multiplatform Application Development IES Ribera de Castilla
- ◆ Course in Video Game Development for Mobile Phones Camilo José Cela University

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*An excellent teaching staff  
for professionals who want  
to improve in their career”*

# 04

# Structure and Content

The contents developed for this Postgraduate Certificate have been specially designed to meet the needs of the sector. This way, students will receive updated training with the best curriculum on the market. Hence, they will be able to develop a game from scratch, work for or found an internationally renowned company or provide their services independently. All this, thanks to an online program with direct qualification, avoiding the need to travel to receive a class or prepare a final assignment to obtain the certification.





“This TECH Postgraduate Certificate will give you the tools to turn your professional career as a designer around”



## Module 1. Advanced Programming

- 1.1. Unity 3D Programming
  - 1.1.1. 3D and Scene Creation
  - 1.1.2. Software Architecture
  - 1.1.3. Game Manager
- 1.2. 3D Character Creation
  - 1.2.1. Movement
  - 1.2.2. Jump
  - 1.2.3. Attack
- 1.3. 3D Character Animation
  - 1.3.1. Animation Types
  - 1.3.2. Programming Animations
  - 1.3.3. Advanced Animation Programming
- 1.4. Artificial Intelligence, NPCs and Enemies
  - 1.4.1. AI
  - 1.4.2. NPC
  - 1.4.3. Enemies
- 1.5. Physical
  - 1.5.1. Physical Materials
  - 1.5.2. Hinge Joint/Spring Joint
  - 1.5.3. Distance Joint/Wheel Joint
- 1.6. Physics II
  - 1.6.1. Platform Effector I
  - 1.6.2. Platform Effector II
  - 1.6.3. Surface Effector





- 1.7. Sound
  - 1.7.1. Music
  - 1.7.2. Sound Effects
  - 1.7.3. Advanced SFX and music Programming
- 1.8. Level Programming
  - 1.8.1. Raycast
  - 1.8.2. Pathfinding
  - 1.8.3. Trigger on the Level
- 1.9. Particles and FX
  - 1.9.1. Particle Creation I
  - 1.9.2. Particle Creation II
  - 1.9.3. Color and Effects
- 1.10. Options
  - 1.10.1. Sound
  - 1.10.2. Saved
  - 1.10.3. AutoSave

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*You will be able to make any video game you can imagine come true. Enroll now to achieve this”*

# 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.





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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.*



*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.



# 06 Certificate

The Postgraduate Certificate in Advanced Video Game Programming guarantees students, in addition to the most rigorous and up-to-dated education, access to a Postgraduate Certificate issued by TECH Global University.



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

This program will allow you to obtain your **Postgraduate Certificate in Advanced Video Game Programming** 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 Certificate in Advanced Video Game Programming**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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



## Postgraduate Certificate Advanced Video Game Programming

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



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