

# Hybrid Professional Master's Degree Video Game Programming





## Hybrid Professional Master's Degree Video Game Programming

Course Modality: **Hybrid (Online)**

Duration: **12 months**

Certificate: **TECH Technological University**

Teaching Hours: **1,620 h.**

Website: [www.techtute.com/us/video-games/hybrid-professional-master-degree/hybrid-professional-master-degree-video-game-programming](http://www.techtute.com/us/video-games/hybrid-professional-master-degree/hybrid-professional-master-degree-video-game-programming)

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# 01 Introduction

The video game creation sector is more than consolidated and attracts more and more young people. One of the pillars that support a great title in the video game industry is programming. The processing that creates the basic instructions and dictates their overall operation is essential for the story and development of the game to run smoothly. This hybrid program offers the gaming professional a specialization that will allow him to advance his career in the *Gaming* sector. A program that you will study 100% online adapted to your needs, and that includes internships in a video game creation and development studio. All this will allow you to advance your professional career with the best experts.





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*Become one of the best programmers in the videogame industry with this Hybrid Professional Master's Degree"*

The video game industry has great potential. The increase in demand and the demands of the *Gamers* have led this sector to a race for perfection in their titles. The high level of quality in each of the creations takes behind a team of programming professionals who have excellent qualifications.

This Hybrid Professional Master's Degree in Video Game Programming responds to the current needs of the market, which demands increasingly specialized professionals with a high degree of involvement in the creations. Creativity plays an important role, but without solid knowledge, it would not be possible to obtain high-level video games.

For this reason, this degree offers students a thorough knowledge of the fundamentals of programming and software engineering and delves into the data structure and algorithm, in addition to teaching object-oriented programming and engine specifications. This program also addresses real-time programming to offer the video game professional a complete Hybrid Professional Master's Degree.

To achieve the goal of progress in the professional career of video game programming, students will have an expert teaching staff in this area, who will guide and tutor them at all times. In addition, the interactive content with video summaries, case studies, and additional readings will complement the extensive syllabus made available by TECH in this 100% online program with in-company internships.

This way, students will be able to complete this academic path with a 3-week intensive on-site stay in a leading studio in video game programming. An ideal professional environment where you will be able to test in situ the most sophisticated working methods, programs, and techniques for the creation of high-quality titles. A unique opportunity that only TECH, the largest digital university in the world, can offer you.

This **Hybrid Professional Master's Degree in Video Game Programming** contains the most complete and up-to-date program on the market. The most important features include:

- ♦ Development of more than 100 video game programming cases presented by programming professionals and university professors with extensive experience in the Video Game Industry
- ♦ 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 cases presented by experts in video game programming and 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
- ♦ 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
- ♦ All of this will be complemented by 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
- ♦ Furthermore, you will be able to carry out a clinical internship in one of the best centers on the international scene

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*This 100% online program gives you the opportunity to intern in a studio and test yourself with the best programmers”*

In this Master's program, of a professionalizing nature and hybrid learning modality, the program is aimed at updating Video Games professionals who develop their functions in great creative studios and require a high qualification level. The contents are based on the latest scientific evidence, and oriented in an educational way to integrate theoretical knowledge in the practice of the *gaming* industry practice, and the theoretical-practical elements will facilitate knowledge updates and decision-making in Video Game Programming.

Thanks to the multimedia content, developed with the latest educational technology, Video Games professionals will benefit from situated and contextual learning, i.e., a simulated environment that will provide immersive learning 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 experts.

*This Hybrid Professional Master's Degree will allow you to become a reference in the area of video game programming. Enroll now.*

*Develop applications efficiently applied to video game engines thanks to this Hybrid Professional Master's Degree.*



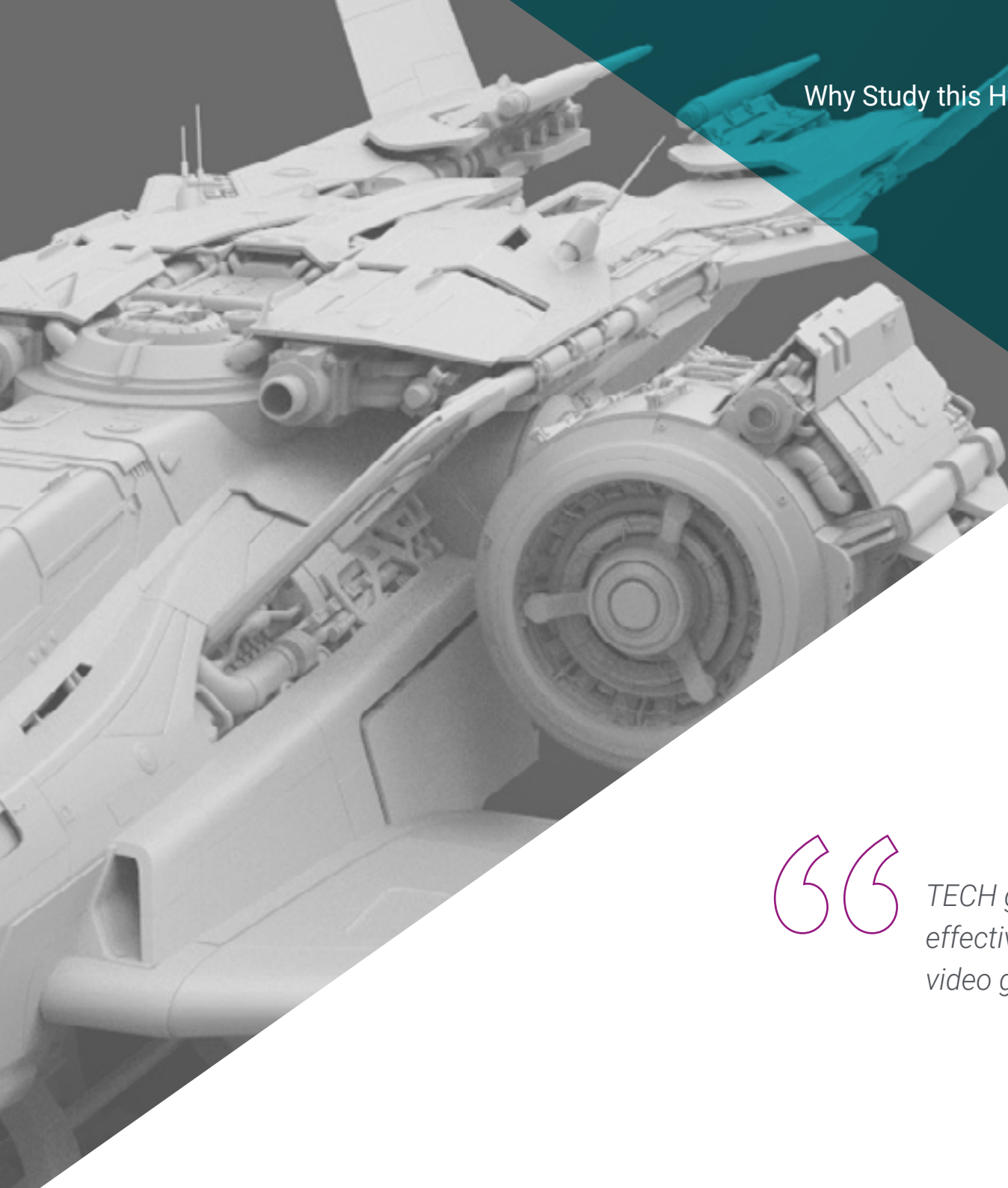
# 02

## Why Study this Hybrid Professional Master's Degree?

Programming requires solid theoretical knowledge, but undoubtedly, daily practice is what perfects the mastery of the professional in the video game industry. That is why TECH has created this program, which perfectly combines the most advanced online syllabus in areas such as algorithm design, intelligent systems, and real-time programming with a practical stay in a leading programming studio. In this way, students will obtain a much more complete vision of Video Game Programming, the programs used, and the latest techniques. All this is always guided at all times by the best experts in this field.







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*TECH gives you the opportunity to take an effective and intensive practical internship in video game programming”*

### 1. Updating from the latest technology available

In recent years, technology has revolutionized the area of Video Game Programming, favoring the creation of titles of higher quality and realism. For this reason, and in order to bring students closer to this technology, TECH has created this Hybrid Professional Master's Degree, where the professional will learn about video game engines, current technological challenges, and software for the creation of ontologies. In this way, they will achieve an update on the latest technology available.

### 2. Gaining In-Depth Knowledge from the Experience of Top Specialists

In this academic journey, students will always be guided by the best specialists in Video Game Programming. In this way, the graduate will have an excellent teaching team with extensive experience in the sector, who will accompany them during the theoretical phase, while, during the on-site stay, they will be together with real experts who are part of the studio team where they will carry out the practical phase.

### 3. Entering First-Class Clinical Environments

TECH carries out a rigorous selection process of all studios and companies where internships are carried out. In this way, students are guaranteed access to a first-level professional environment in Video Game Programming. In this way, they will be able to see first-hand what the day-to-day work of a specialized programmer is like, as well as the techniques and methods used to achieve quality titles.





#### 4. Combining the Best Theory with State-of-the-Art Practice

TECH, with this program, is adapted to the daily work of programmers, and that is why it adopts a theoretical-practical approach, away from long hours of study, to focus on the key concepts. This academic institution, therefore, offers an innovative learning model that allows students to acquire the necessary knowledge to take the lead in the programming of high-quality video games.

#### 5. Expanding the Boundaries of Knowledge

TECH offers the possibility of doing this Internship Program, not only in national, but also in international centers. This way, the specialist will be able to expand their frontiers and catch up with the best professionals, who practice in first class centers and in different continents. A unique opportunity that only TECH, the largest online university in the world, could offer.

“

*You will have full practical immersion  
at the center of your choice”*

# 03 Objectives

The design of this Hybrid Professional Master's Degree program will allow students to acquire the necessary skills to advance in a highly competitive program that requires qualified personnel. Therefore, the main objective of this teaching is to ensure that students become excellent video game developers using all the tools that this teaching provides. To achieve this, this program provides up-to-date multimedia content with additional readings and a *Relearning* learning system based on the reiteration of content, which will facilitate the cementing of concepts.



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*Do you want to start a multiplayer game? Learn how to transform your idea into a real programming language for this kind of video games”*



## General Objective

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- To achieve that, the students know the different programming languages and methods applied to video games. To this end, the production process of a title and its integration in the different stages will be studied in depth. Likewise, the videogame professional will learn the basics of videogame design and the main theoretical knowledge. In addition, at the end of this course, the student will be able to understand the role of programming and develop web and multiplayer video games



*This program will allow you to advance professionally. You will be able to master any data structure and algorithms with this Hybrid Professional Master's Degree"*



## Specific Objective

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### Module 1. Programming Fundamentals

- Understand the basic structure of a computer, software and general purpose programming languages
- Analyze the essential elements of a computer program, such as the different data types, operators, expressions, statements, I/O and control statements
- Interpret Algorithms as the necessary basis to develop Computer Programs

### Module 2. Data Structure and Algorithms

- Learn the main strategies for algorithm design, as well as the different methods and measures for algorithm computation
- Understand algorithm function, strategies and examples of the most common problems
- Understand the *Backtracking technique and its main uses*

### Module 3. Object Oriented Programming

- Know the different design patterns for object-oriented problems
- Understand the importance of documentation and testing in software development
- Manage the use of threading and synchronization, and solve common problems in concurrent programming

**Module 4. Consoles and Devices for Videogames**

- ♦ Know the basic functioning of the main input and output peripherals
- ♦ Understand the main implications of design for different platforms
- ♦ Study the structure, organization, functioning and interconnection of devices and systems
- ♦ Understand the function of the operative system and the development kits for mobile devices and video game platforms

**Module 5. Software Engineering**

- ♦ Become familiar with the bases of software engineering, software processes and different development models, including agile technologies
- ♦ Recognize requirements engineering, its development, elaboration, negotiation and validation in order to understand the main standards in terms of software quality and project management

**Module 6. Video Game Engines**

- ♦ Discover how a video game engine works and its 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

**Module 7. Intelligent Systems**

- ♦ Establish agent theory concepts, agent architecture and the reasoning process behind it
- ♦ Assimilate the theory and practice behind the concepts of information and knowledge, as well as the different ways of representing knowledge
- ♦ Understand the functioning of semantic reasoners, knowledge-based systems and expert systems

**Module 8. Real-Time Programming**

- ♦ Analyze the key features of real-time programming languages that differentiate them from traditional programming languages
- ♦ Understand the basic concepts behind computer systems
- ♦ Acquire the ability to apply the main bases and techniques of real-time programming

**Module 9. Web Game Design and Development**

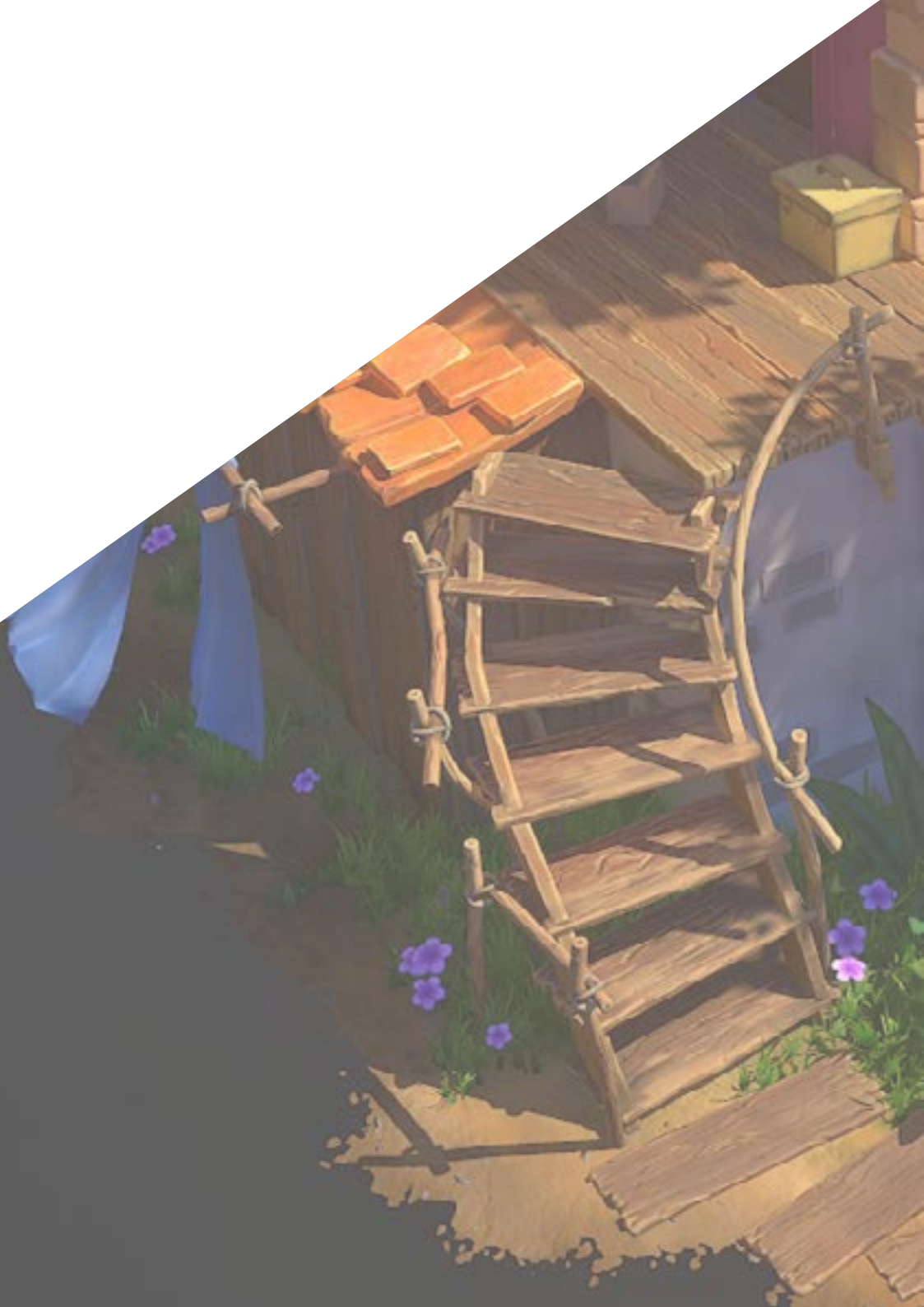
- ♦ Design Games and Interactive Web Applications with the corresponding Documentation
- ♦ Evaluate the main features of games and interactive web applications for professional and adequate communication

**Module 10. Multiplayer Networks and Systems**

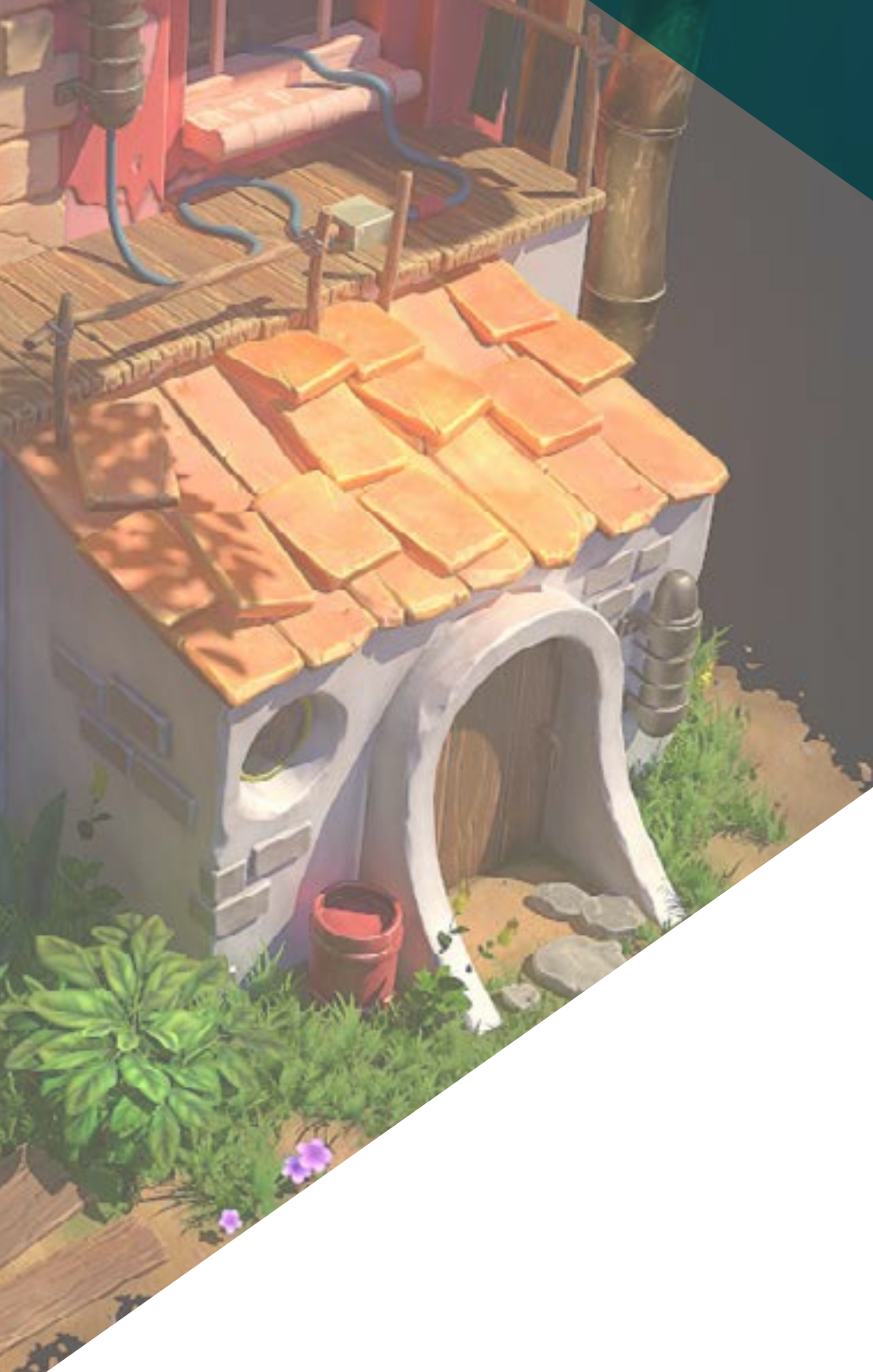
- ♦ Describe the Transmission Control Protocol/Internet Protocol (TCP/IP) architecture and the basic operation of wireless networks
- ♦ Analyze video games security
- ♦ Acquire the ability to develop online games for multiple players

# 04 Skills

The videogame professional who takes this Hybrid Professional Master's Degree will acquire a series of skills that will allow them to join any type of videogame development studio. Therefore, at the end of this course, students will have the necessary skills to program in different languages used in the *gaming* industry and will acquire the essential skills to run a project from start to finish on different platforms and video game engines.







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*Acquire the necessary skills to program video games for Xbox One, PS4, and Wii U-Switch"*



## General Skills

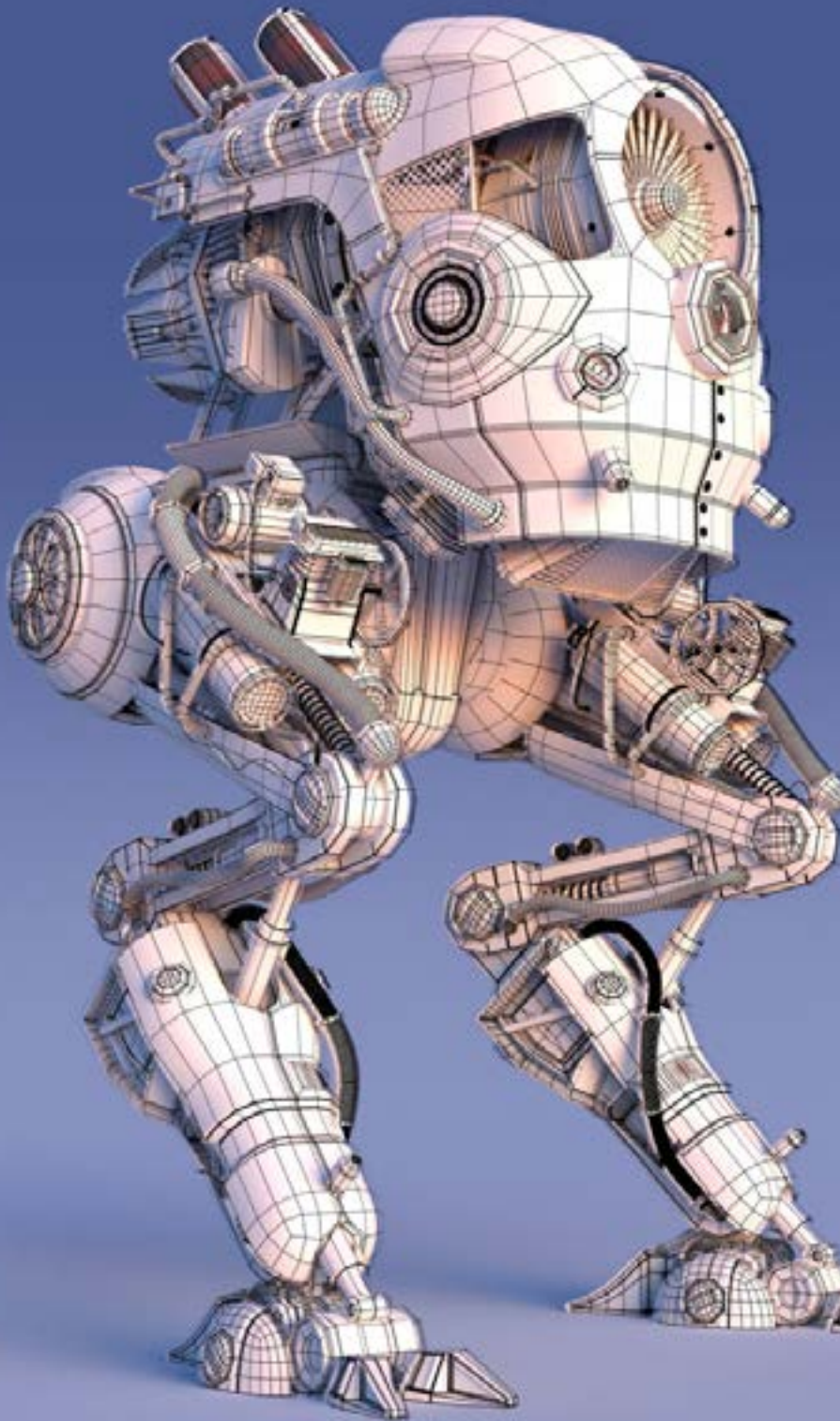
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- ◆ Design all the phases in developing a video game, from start to the final launch
- ◆ Specialize as a video game programmer
- ◆ Delve into all the developmental stages, from the initial architecture and player-character programming to every element involved in the game process
- ◆ Obtain an overall vision of the project, being able to provide solutions to the different problems and challenges that arise in the design of a video game

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*Before programming, know the gamer's experience and analyze the gameplay of the video game. With this Hybrid Professional Master's Degree you will learn how to achieve success"*





## Specific Skills

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- ◆ Know the necessary software to be a professional video game developer
- ◆ Understand the player's experience and know how to analyze video game gameplay
- ◆ Understand all the theoretical and practical procedures involved in video game programming processes
- ◆ Master the most useful programming languages used in the video game world
- ◆ Integrate the programming learned to different types of consoles and platforms
- ◆ Program web and multiplayer video games
- ◆ Assimilate the concept of a video game engine for correct programming
- ◆ Apply knowledge of software engineering to video game programming

# 05

## Educational Plan

This Hybrid Professional Master's Degree in Video Game Programming offers students complete and comprehensive content in video game development structured in 10 specialized modules. The faculty of this degree program will be able to delve into the fundamentals of programming while acquiring up-to-date, practice-oriented knowledge. In this way, students receive quality education with innovative content in a multimedia format that can be downloaded and consulted at any time. The 100% online theoretical training gives you the freedom to distribute the teaching load according to your needs.





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*A curriculum designed to provide you with the most advanced and current content on video game programming”*



























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*Thanks to the Relearning Method, based on Key Concepts reiteration, you will be able to reduce the long hours of study”*

# 06 Practices

Once the video game professional concludes the online theoretical education, this degree includes an internship in a creative studio and a video game developer. In this way, students will be able to come into direct contact with teams of developers in the sector and will be able to demonstrate everything they have learned. During this learning stage, the student will have a tutor who will accompany them until the end of the course.



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*Sit next to great developers and work as a team during the hands-on phase of this course"*

The Internship Program's Internship Program lasts 3 weeks. Students will attend the creative studio and video game developer from Monday to Friday with a day of 8 consecutive hours of practical teaching by a specialist.

This practical phase will allow students to deploy all their programming knowledge acquired in this Hybrid Professional Master's Degree. With other professionals in this company, you will be able to coordinate with the rest of the team and learn the main programming tools and software. In this way, they obtain an apprenticeship close to the reality of the video game industry.

During the stay in this studio, the professional will not only use the usual programming language but will also be able to design multiplayer video games. A category of video games that is on the rise and that fascinates *Gamers*.

The student will actively participate by performing activities and procedures related to each area of competence (learning to learn and learning to do), with the support and guidance of the teachers and other classmates to facilitate teamwork and multidisciplinary integration as transversal skills for the practice of Video Game Programming (learning to be and learning to relate to others).

The procedures described below will be the basis of the practical part of the training, and their implementation will be subject to the center's own availability and workload, the proposed activities being the following:



*Train in a studio that will give you the opportunity to demonstrate your potential as a videogame programmer"*



Module	Practical Activity	Quantity
<b>Creation of Data Structure and Algorithms</b>	Carry out the Backtracking technique for the creation of data and algorithms	1
	Participate in the analysis of algorithms for efficiency gains	
	Perform input size and runtime measurement tasks	
	Create Sorting algorithms with trees, with Heaps, with graphs and with Greedy	
<b>Object Oriented Programming</b>	Use the Factory Pattern, Singleton Pattern, Observer Pattern, and Composite Pattern	1
	Creating, catching and managing exceptions in object creation	
	Perform concurrent programming	
	Employ locking and communication mechanisms	
	Create software documentation and testing	
<b>Real-Time Programming</b>	Create and synchronizeThreads	1
	ProgrammingShaders	
	Implement the pattern in Java and use Java libraries	
	Create Post-Effects	
	Process interrupts, synchronization, and inter-process communication	
<b>Web Game Design and Development</b>	Programming the web with HTML forms	1
	Use DOCTYPE and inner HTML for Web Game Development	
	Make use of PlayCanvas for Web Game Development	
	Configuring the web game design and development project	

## Civil Liability Insurance

This institution's main concern is to guarantee the safety of the trainees and other collaborating agents involved in the internship process at the company. Among the measures dedicated to achieve this is the response to any incident that may occur during the entire teaching-learning process.

To this end, this entity commits to purchasing a civil liability insurance policy to cover any eventuality that may arise during the course of the internship at the center.

This liability policy for interns will have broad coverage and will be taken out prior to the start of the practical training period. That way professionals will not have to worry in case of having to face an unexpected situation and will be covered until the end of the internship program at the center.



## General Conditions of the Internship Program

The general terms and conditions of the internship program agreement shall be as follows:

**1. TUTOR:** During the Hybrid Professional Master's Degree, students will be assigned with two tutors who will accompany them throughout the process, answering any doubts and questions that may arise. On the one hand, there will be a professional tutor belonging to the internship center who will have the purpose of guiding and supporting the student at all times. On the other hand, they will also be assigned with an academic tutor whose mission will be to coordinate and help the students during the whole process, solving doubts and facilitating everything they may need. In this way, the student will be accompanied and will be able to discuss any doubts that may arise, both clinical and academic.

**2. DURATION:** The internship program will have a duration of three continuous weeks, in 8-hour days, 5 days a week. The days of attendance and the schedule will be the responsibility of the center and the professional will be informed well in advance so that they can make the appropriate arrangements.

**3. ABSENCE:** If the students does not show up on the start date of the Internship Program, they will lose the right to it, without the possibility of reimbursement or change of dates. Absence for more than two days from the internship, without justification or a medical reason, will result in the professional's withdrawal from the internship, therefore, automatic termination of the internship. Any problems that may arise during the course of the internship must be urgently reported to the academic tutor.

**4. CERTIFICATION:** Professionals who pass the Hybrid Professional Master Program will receive a certificate accrediting their stay at the center.

**5. EMPLOYMENT RELATIONSHIP:** the Hybrid Professional Master Program shall not constitute an employment relationship of any kind.

**6. PREVIOUS EDUCATION:** Some centers may require a certificate of prior education for the Internship Program. In these cases, it will be necessary to submit it to the TECH internship department so that the assignment of the chosen center can be confirmed.

**7. NOT INCLUDED:** the Hybrid Professional Master's Degree will not include any element not described in the present conditions. Therefore, it does not include accommodation, transportation to the city where the internship takes place, visas or any other items not listed.

However, students may consult with their academic tutor for any questions or recommendations in this regard. The academic tutor will provide the student with all the necessary information to facilitate the procedures in any case.

07

# Where Can I Do the Internship?

This Hybrid Professional Master's Degree includes a practical stay in a reference studio where students will put into practice everything they have learned about video game programming. In this way, TECH offers students the opportunity to bring this program to video game professionals who wish to acquire a quality education according to the current demands of the sector.



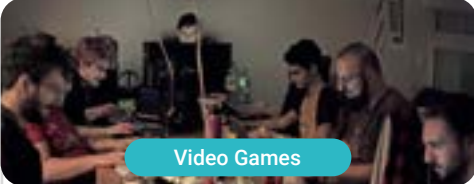


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*Reach your goals by applying all your knowledge in a benchmark studio in the video game industry”*



Students can take the practical part of this Hybrid Professional Master's Degree at the following centers:



**Video Games**

**Startreming Games**

Country	City
Argentina	Mendoza

Management: Route 160 corner Buenos Aires 88, San Rafael, Mendoza

Independent and remote working game development studio

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**Related internship programs:**

- Video Game Programming
- 3D Hard Surface Modeling

**Video Game Programming**





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*Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice”*

08

# 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.



09

# Certificate

This Hybrid Professional Master's Degree in Video Game Programming guarantees, in addition to the most rigorous and updated training, access to a Hybrid Professional Master's Degree issued by TECH Technological University.



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

This **Hybrid Professional Master's Degree in Video Game Programming** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Hybrid Professional Master's Degree** issued by **TECH Technological University** via tracked delivery\*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Hybrid Professional Master's Degree and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

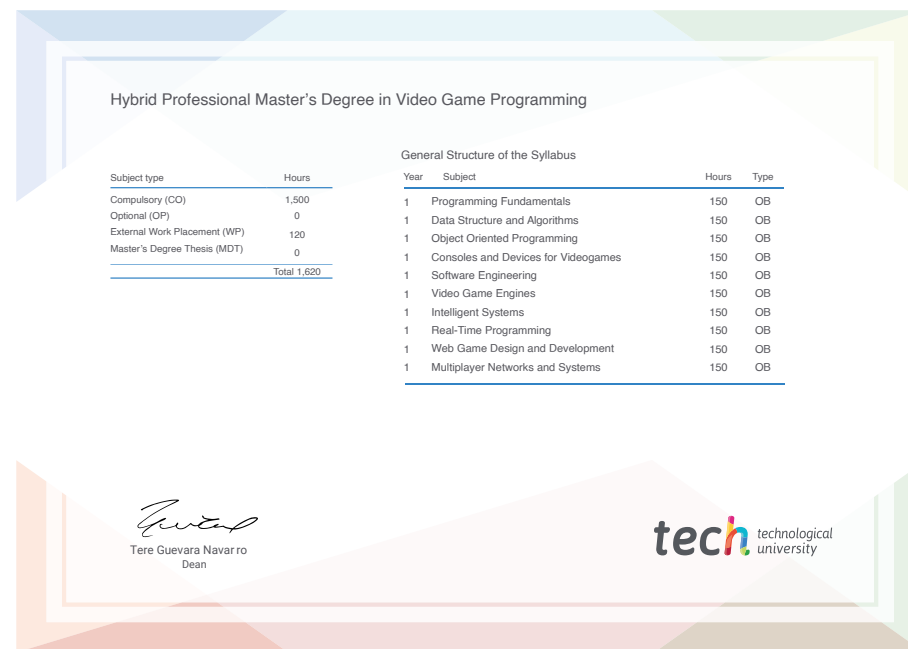
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Course Modality: **Hybrid (Online + Internship)**

Duration: **12 months.**

Certificate: **TECH Technological University**

Teaching Hours: **1,620 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.



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