Postgraduate Certificate

Definition of Artificial Intelligence Software Architectures

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Postgraduate Certificate
Definition of Artificial Intelligence Software Architectures

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

Website: **www.techtitute.com/us/artificial-intelligence/postgraduate-certificate/definition-artificial-intelligence-software-architectures**

Index

01 Introduction p. 4

02 Objectives p. 8

03 Course Management p. 12

04 Structure and Content p. 16

05 Methodology p. 20

06 Certificate p. 28

01

Introduction

In the world of programming, algorithms are a valuable tool for developing products that incorporate Artificial Intelligence (AI). Computer scientists use these mechanisms to make predictions and decisions based on data. Along these lines, these technological resources are also used to find optimal solutions to complex problems (an example being route optimization in logistics). On the other hand, these tools are useful for analyzing user behavior and preferences. In this way, experts will be able to offer them personalized recommendations that capture their interest to a greater extent. Faced with this reality, TECH implements a pioneering program that will perfect the data structure through Artificial Intelligence. And all in a convenient 100% online format.

You have at your fingertips 6 weeks of intensive, rigorous and current information on the most effective Software Architectures with Artificial Intelligence"

Software Architecture plays a fundamental role in the QA *Testing* process for multiple reasons. For example, it enables early identification of code problems to save time and resources. It also facilitates test automation, allowing *testers* to create more efficient and maintainable scripts over time. In addition, these structures ensure stability in order to meet the changing needs of users. IT professionals have the possibility to evaluate how the software behaves under different loads and thus verify its performance.

In this context, TECH launches an exclusive program that will delve into optimization and performance management in tools with Artificial Intelligence. To this end, the curriculum will delve in detail into key concepts, among which are: scalability, maintainability and performance. Likewise, the syllabus will analyze the most innovative tools for large-scale data storage. In addition, students will explore programming algorithms to solve problems and calculate results. The program will also highlight how to secure web applications to prevent cyber-attacks.

The university program brings together in 180 teaching hours the most advanced information for designing large-scale systems. To this end, the teaching staff has developed a university proposal with numerous didactic materials that include interactive summaries, case studies and infographics. In addition, thanks to the Relearning method, the students will be able to consolidate key concepts and reduce the hours spent memorizing. They will also have greater freedom to self-manage the time they spend accessing the syllabus, since this program presents a 100% online methodology. Students taking this program only need a cell phone,tabletor computer with an Internet connection to access the Virtual Campus. Therefore, professionals have before them an ideal option to keep abreast of advances in this field through an avant-garde university proposal.

This **Postgraduate Certificate in Definition of Artificial Intelligence Software Architectures** contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical cases presented by experts in Artificial Intelligence in programming
- 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

Looking to delve into large-scale data warehousing? This university program will provide you with the most sophisticated tools to achieve it"

You'll delve into the most effective strategies for secure software development in web applications. And only in 180 hours thanks to this program!"

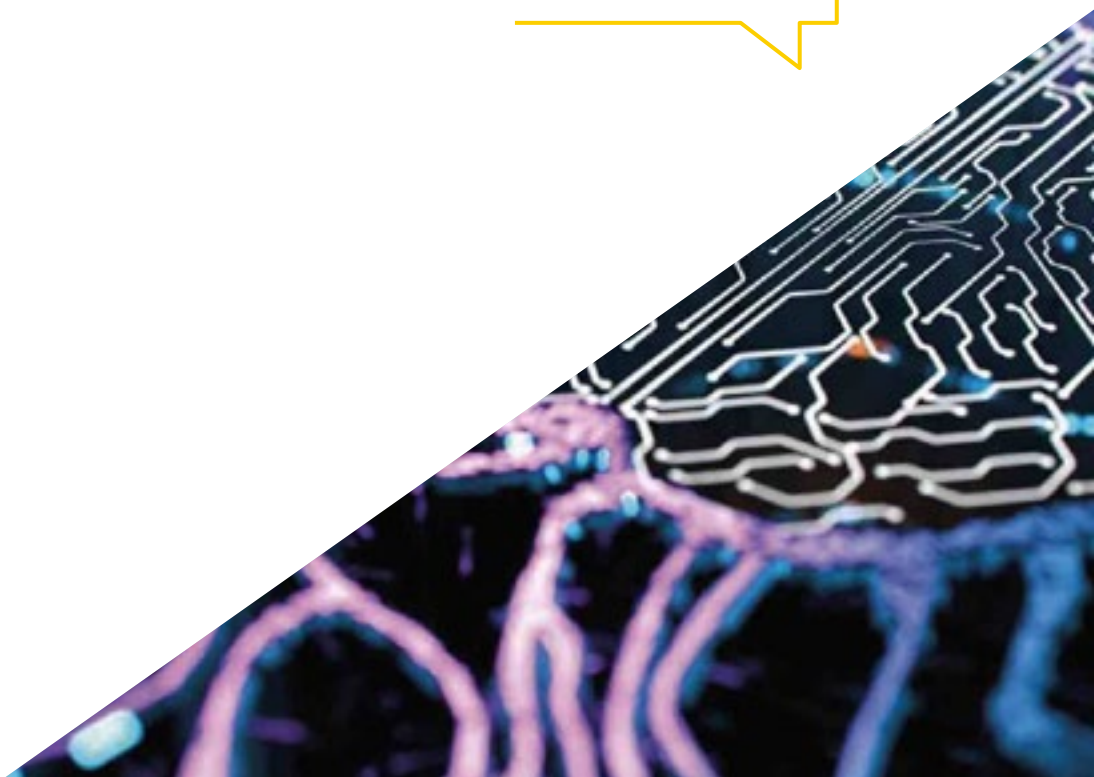
Thanks to the Relearning method, you will not have to spend long hours studying and memorizing.

TECH adapts to your schedule, that's why it has designed a flexible and 100% online program.

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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 education 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 during the academic year For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.



02

Objectives

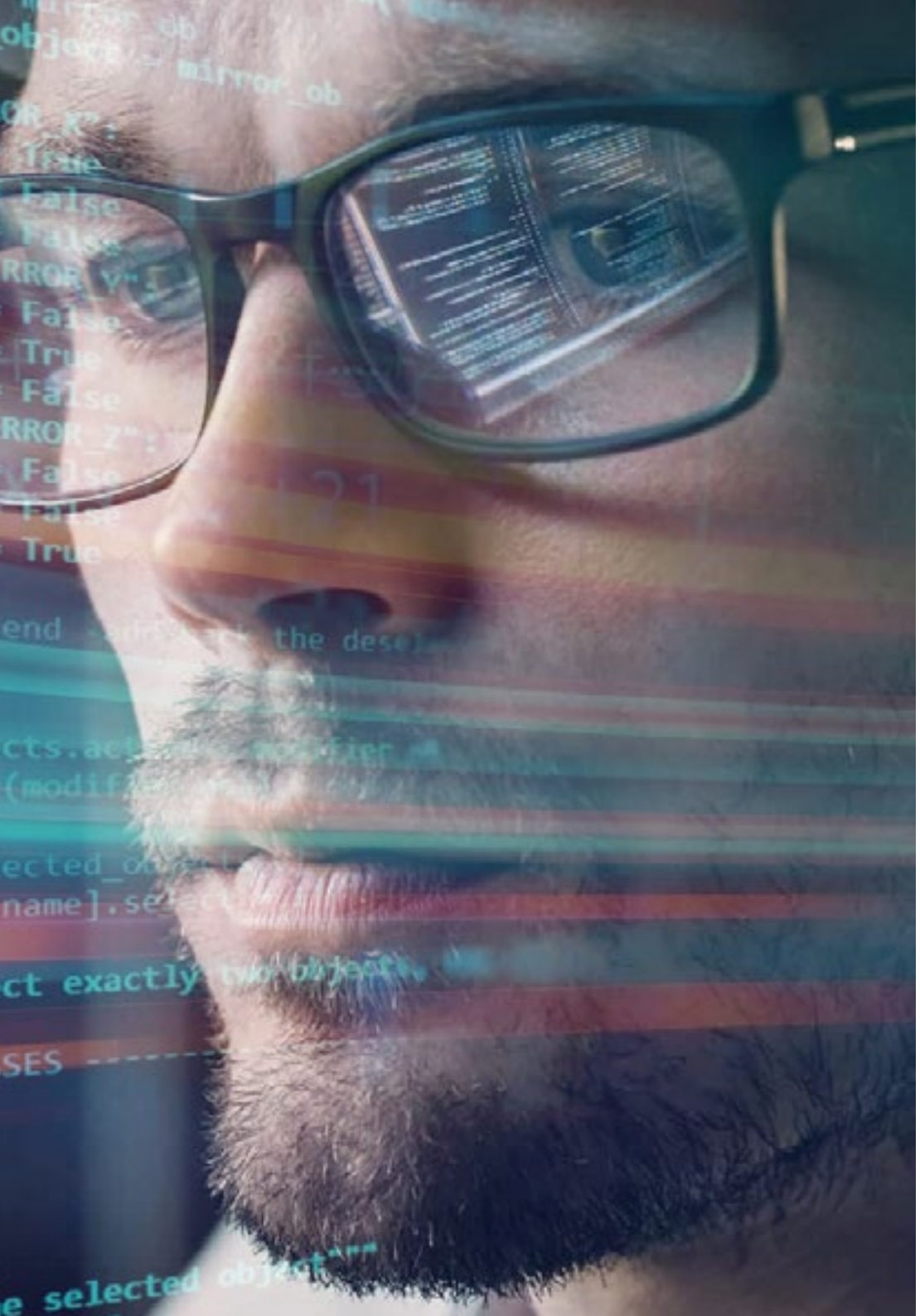
This revolutionary university program will provide graduates with extensive knowledge to design computer systems defined by their scalability and handling of big data. Upon completion of the program, experts will apply the most effective tools for data structures powered by Artificial Intelligence. As such, they will excel in optimizing both software performance and efficiency. On the other hand, IT professionals will apply to their procedures practices that guarantee a highly secure development. This will enable them to avoid common vulnerabilities such as injection, thus ensuring the well-being of users by protecting their personal data.

Thanks to the Relearning method, you will not have to spend long hours studying and memorizing. Learn in a natural way!"

General Objectives

- Develop skills to set up and manage efficient development environments, ensuring a solid foundation for the implementation of AI projects
- Acquire skills in planning, executing and automating quality tests, incorporating AI tools for *bug*detection and remediation
- Understand and apply performance, scalability and maintainability principles in the design of large-scale computing systems
- Become familiar with the most important design patterns and apply them effectively in software architecture

A comprehensive program of high interest to IT professionals that will enable you to compete among the best in the industry"



Specific Objectives

- Develop skills to design solid test plans, covering different types of *testing*and ensuring software quality
- Recognize and analyze different types of software frameworks, such as monolithic, microservices or service-oriented
- Gain a comprehensive view on the principles and techniques for designing computer systems that are scalable and capable of handling large volumes of data
- Apply advanced skills in the implementation of AI-powered data structures to optimize software performance and efficiency
- Develop secure development practices, with a focus on avoiding vulnerabilities to ensure software security at the architectural level

03

Course Management

In order to ensure the correct updating process for IT professionals, TECH has carried out a thorough selection process of each and every one of the teachers that make up this program. These professionals stand out for their extensive work experience, forming part of technological institutions of international prestige. Likewise, in their commitment to offer services based on excellence, they have mastered the most innovative tools of Machine Learning. In this way, students will have access to an exhaustive and updated syllabus, based on the latest trends for the development of secure software in web applications with Artificial Intelligence.

The leading experts in Artificial Intelligence have joined forces to share with you all their knowledge in this field"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shepherds GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- Ph.D. in Psychology from the University of Castilla - La Mancha
- Ph.D. in Economics, Business and Finance from the Camilo José Cela University
- Ph.D. in Psychology from University of Castilla – La Mancha
- Máster in Executive MBA por la Universidad Isabel I
- Master's Degree in Sales and Marketing Management, Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla - la Mancha
- Member of: SMILE Research Group

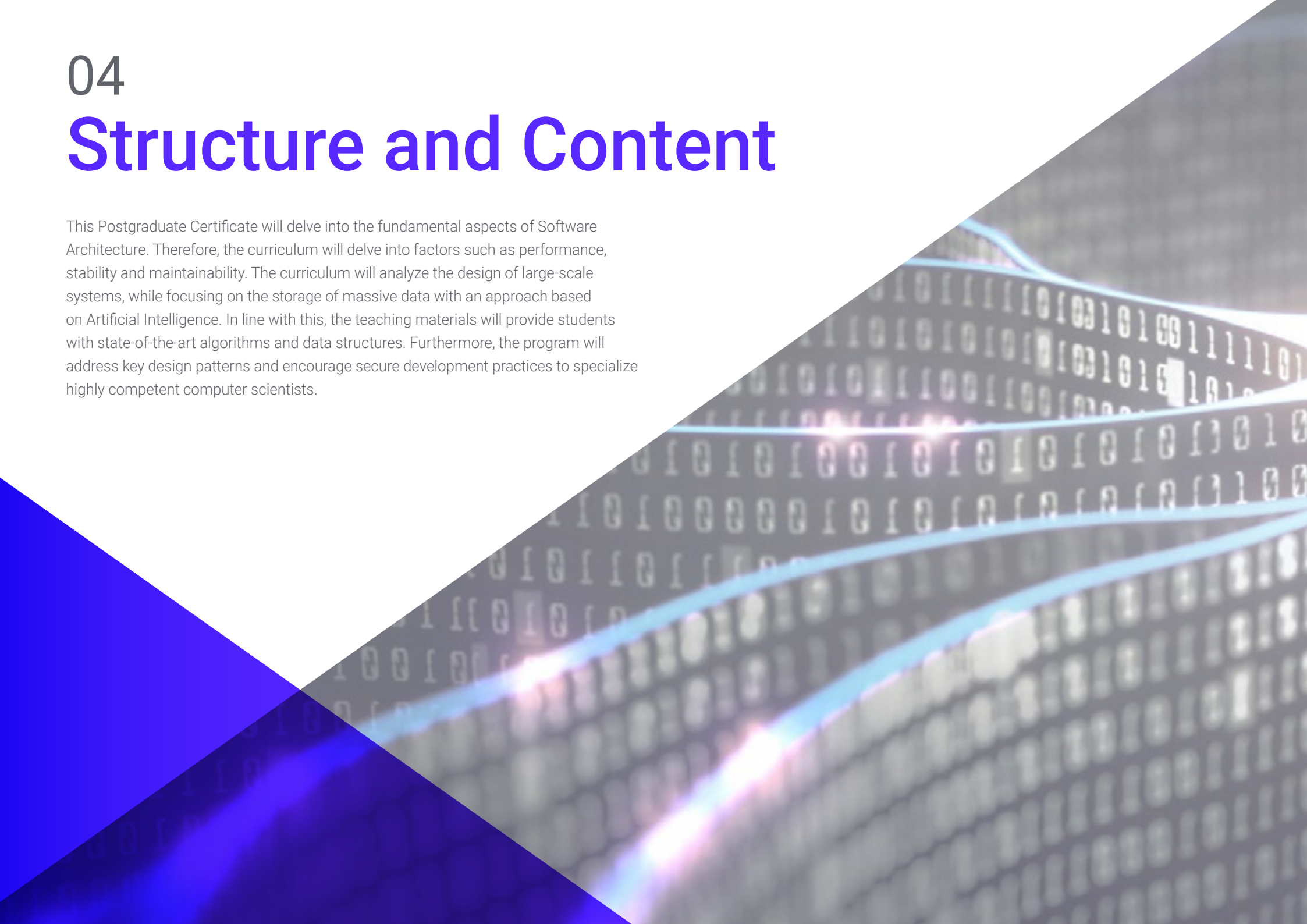
Mr. Castellanos Herreros, Ricardo

- Chief Technology Officer at OWQLO
- Freelance Technical Consultant
- Mobile Applications Developer for eDreams, Fnac, Air Europa, Bankia, Cetelem, Banco Santander, Santillana, Groupón and Grupo Planeta
- Web Developer for Openbank and Banco Santander
- Machine Learning Engineer course at Udacity
- Technical Engineer in Computer Systems from the University of Castilla la Mancha

04

Structure and Content

This Postgraduate Certificate will delve into the fundamental aspects of Software Architecture. Therefore, the curriculum will delve into factors such as performance, stability and maintainability. The curriculum will analyze the design of large-scale systems, while focusing on the storage of massive data with an approach based on Artificial Intelligence. In line with this, the teaching materials will provide students with state-of-the-art algorithms and data structures. Furthermore, the program will address key design patterns and encourage secure development practices to specialize highly competent computer scientists.



You will integrate into your computing practice the latest programming algorithms for product development using Machine Learning"

Module 1. Software Architecture with AI

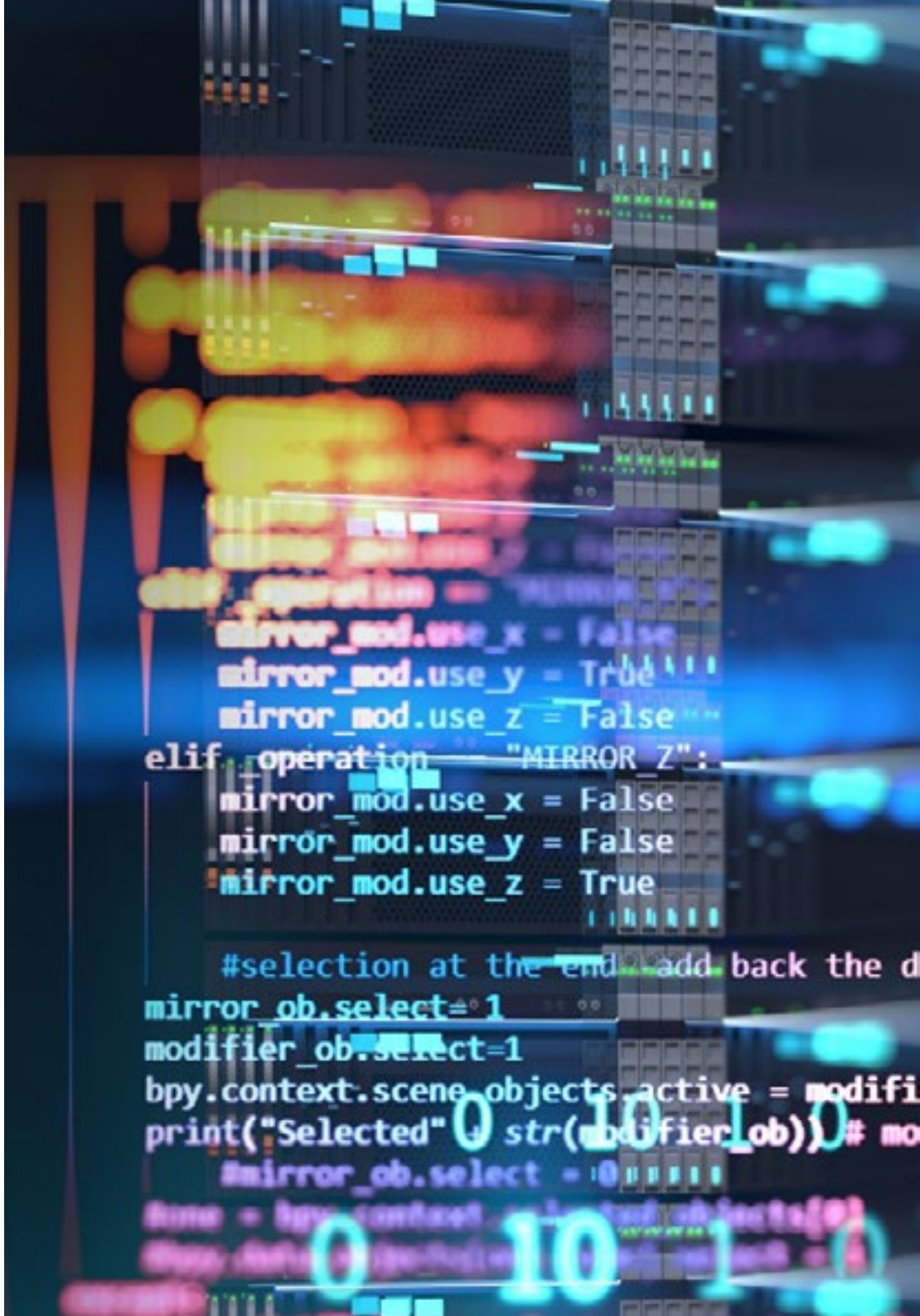
1.1. Optimization and Performance Management in AI Tools
- 1.1.1. Performance Analysis and Profiling in AI Tools
- 1.1.2. Algorithm Optimization Strategies and AI Models
- 1.1.3. Implementation of Caching and Parallelization Techniques to Improve Performance
- 1.1.4. Tools and Methodologies for Continuous Real-Time Performance Monitoring

1.2. Scalability in AI Applications
- 1.2.1. Design of Scalable Architectures for AI Applications
- 1.2.2. Implementation of Partitioning and Load Distribution Techniques
- 1.2.3. Workflow and Workload Management for Scalable Systems
- 1.2.4. Strategies for Horizontal and Vertical Expansion in Variable Demand Environments

1.3. Maintainability of AI Applications
- 1.3.1. Design Principles to Facilitate Maintainability in AI Projects
- 1.3.2. Specific Documentation Strategies for AI Models and Algorithms
- 1.3.3. Implementation of Unit and Integration Tests to Facilitate Maintenance
- 1.3.4. Methods for Refactoring and Continuous Improvement in Systems with AI Components

1.4. Design of Large-Scale Systems
- 1.4.1. Architectural Principles for the Design of Large-Scale Systems
- 1.4.2. Decomposition of Complex Systems into Microservices
- 1.4.3. Implementation of Specific Design Patterns for Distributed Systems
- 1.4.4. Strategies for Complexity Management in Large-Scale Architectures with AI Components

1.5. Large-Scale Data Warehousing for AI Tools
- 1.5.1. Selection of Scalable Data Warehousing Technologies
- 1.5.2. Designing Database Schemas for Efficient Management of Large Data Volumes
- 1.5.3. Partitioning and Replication Strategies in Massive Data Storage Environments
- 1.5.4. Implementation of Data Management Systems to Ensure Integrity and Availability in AI Projects



1.6. Data Structures with AI
- 1.6.1. Adaptation of Classical Data Structures for Use in AI Algorithms
- 1.6.2. Designing and Optimizing Specific Data Structures for Machine Learning Models
- 1.6.3. Integration of Efficient Data Structures in Data Intensive Systems
- 1.6.4. Strategies for Real-Time Data Manipulation and Storage in AI Data Structures

1.7. Programming Algorithms for AI Products
- 1.7.1. Development and Implementation of Application-Specific Algorithms for AI Applications
- 1.7.2. Algorithm Selection Strategies according to Problem Typwe and Product Requirements
- 1.7.3. Adaptation of Classical Algorithms for Integration into Artificial Intelligence Systems
- 1.7.4. Evaluation and Comparison of Performance between Different Algorithms in AI Development Contexts

1.8. Design Patterns for AI Development
- 1.8.1. Identification and Application of Common Design Patterns in Projects with AI Components
- 1.8.2. Development of Specific Patterns for the Integration of Models and Algorithms into Existing Systems
- 1.8.3. Pattern Implementation Strategies for Improving Reusability and Maintainability in AI Projects
- 1.8.4. Case Studies and Best Practices in the Application of Design Patterns in AI Architectures

1.9. Implementation of Clean Architecture
- 1.9.1. Fundamental Principles and Concepts of Clean Architecture
- 1.9.2. Adaptation of Clean Architecture to Projects with AI Components
- 1.9.3. Implementation of Layers and Dependencies in Systems with Clean Architecture
- 1.9.4. Benefits and Challenges of Implementing Clean Architecture in AI Software Development

1.10. Secure Software Development in Web Applications with AI
- 1.10.1. Principles of Security in Software Development with AI Components
- 1.10.2. Identifying and Mitigating Potential Vulnerabilities in AI Models and Algorithms
- 1.10.3. Implementation of Secure Development Practices in Web Applications with Artificial Intelligence Functionalities
- 1.10.4. Strategies for the Protection of Sensitive Data and Prevention of Attacks in AI Projects

A high-intensity program that will allow our students to advance quickly and efficiently in their learning. Enroll now!"

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.

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 Information Technology 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. Throughout the course, students 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

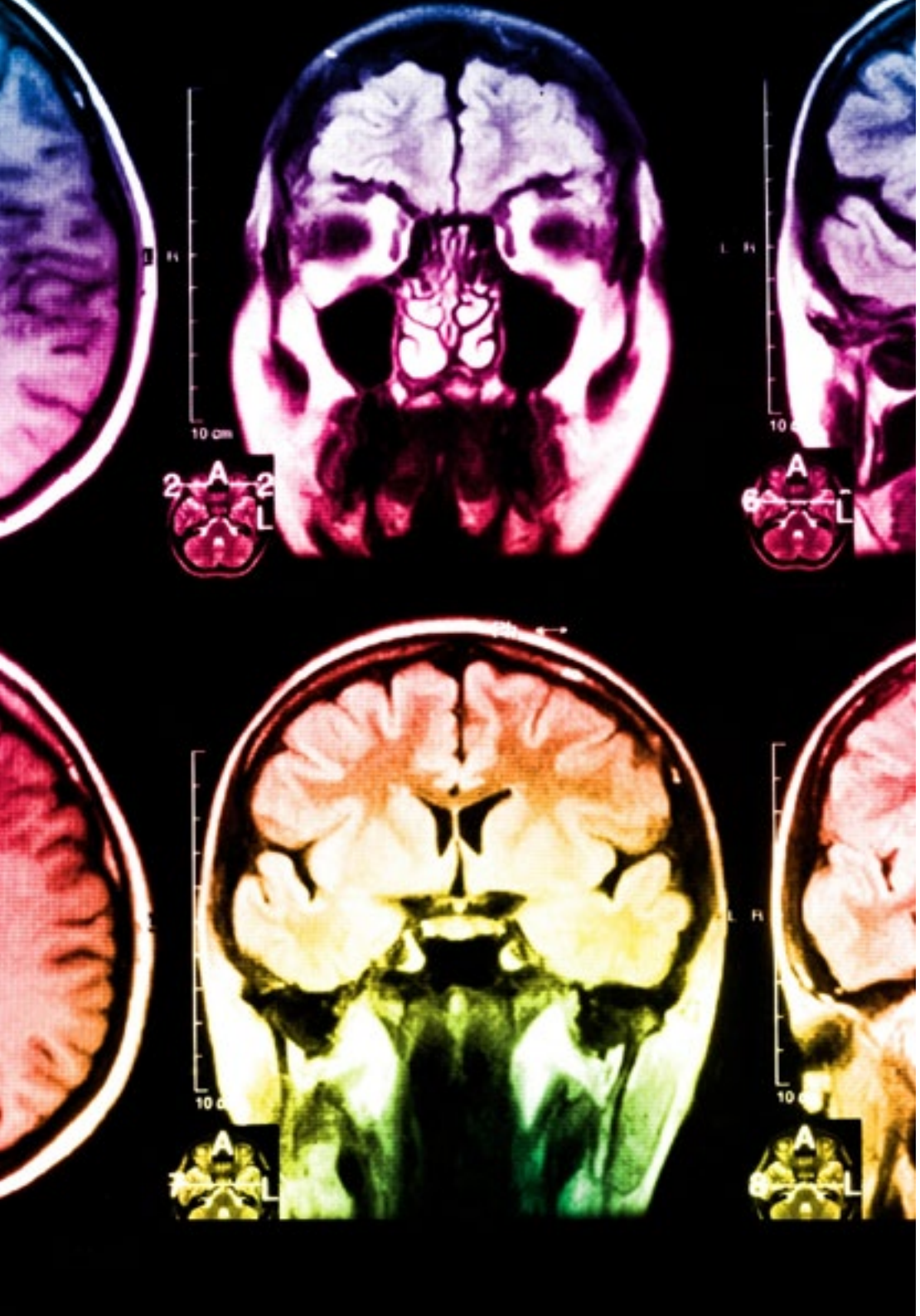
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

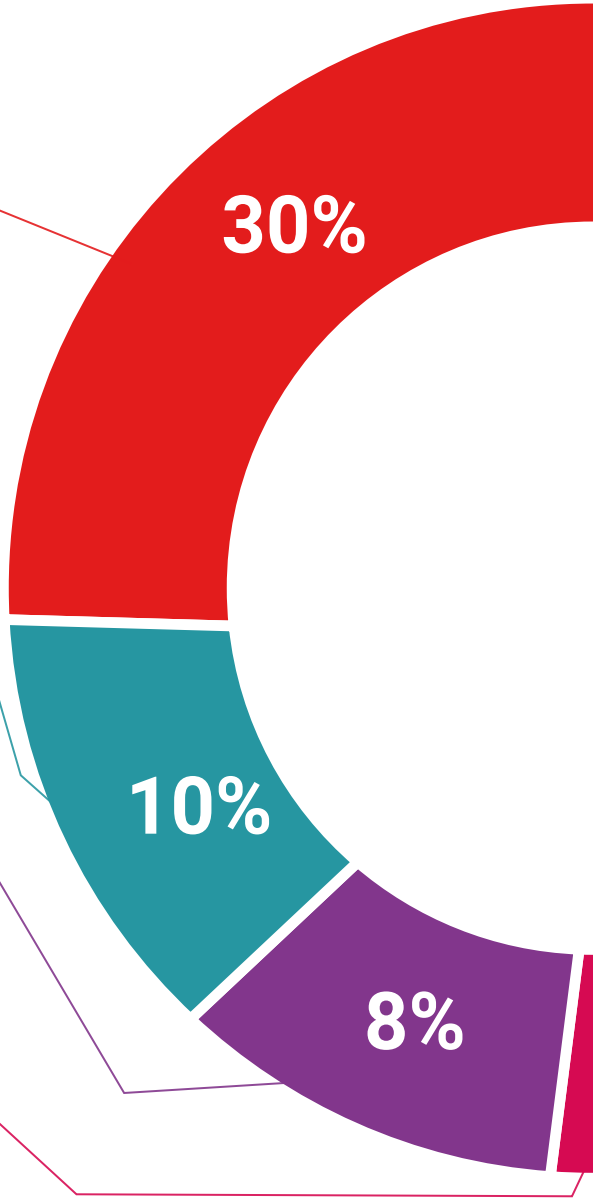
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

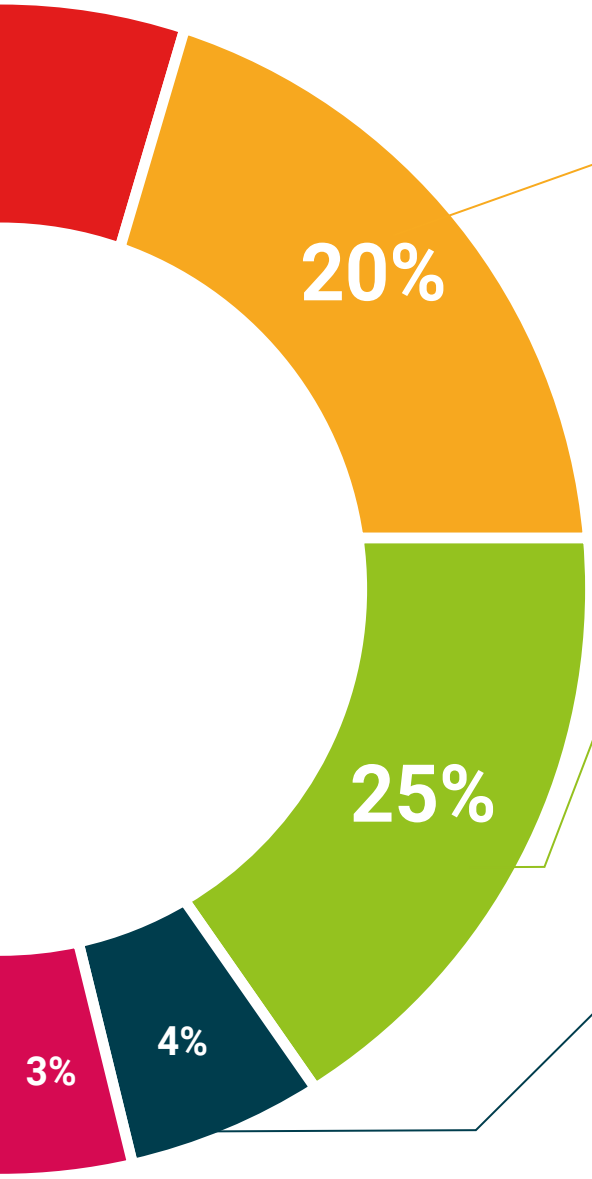
Practising Skills and Abilities

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 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 Definition of Artificial Intelligence Software Architectures guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This program will allow you to obtain your **Postgraduate Certificate in Definition of Artificial Intelligence Software Architectures** 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 Definition of Artificial Intelligence Software Architectures**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Certificate in Definition of Artificial Intelligence Software Architectures

This is a program of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Rector

Unique TECH Code: AFWORD23S techtitute.com/certificates

*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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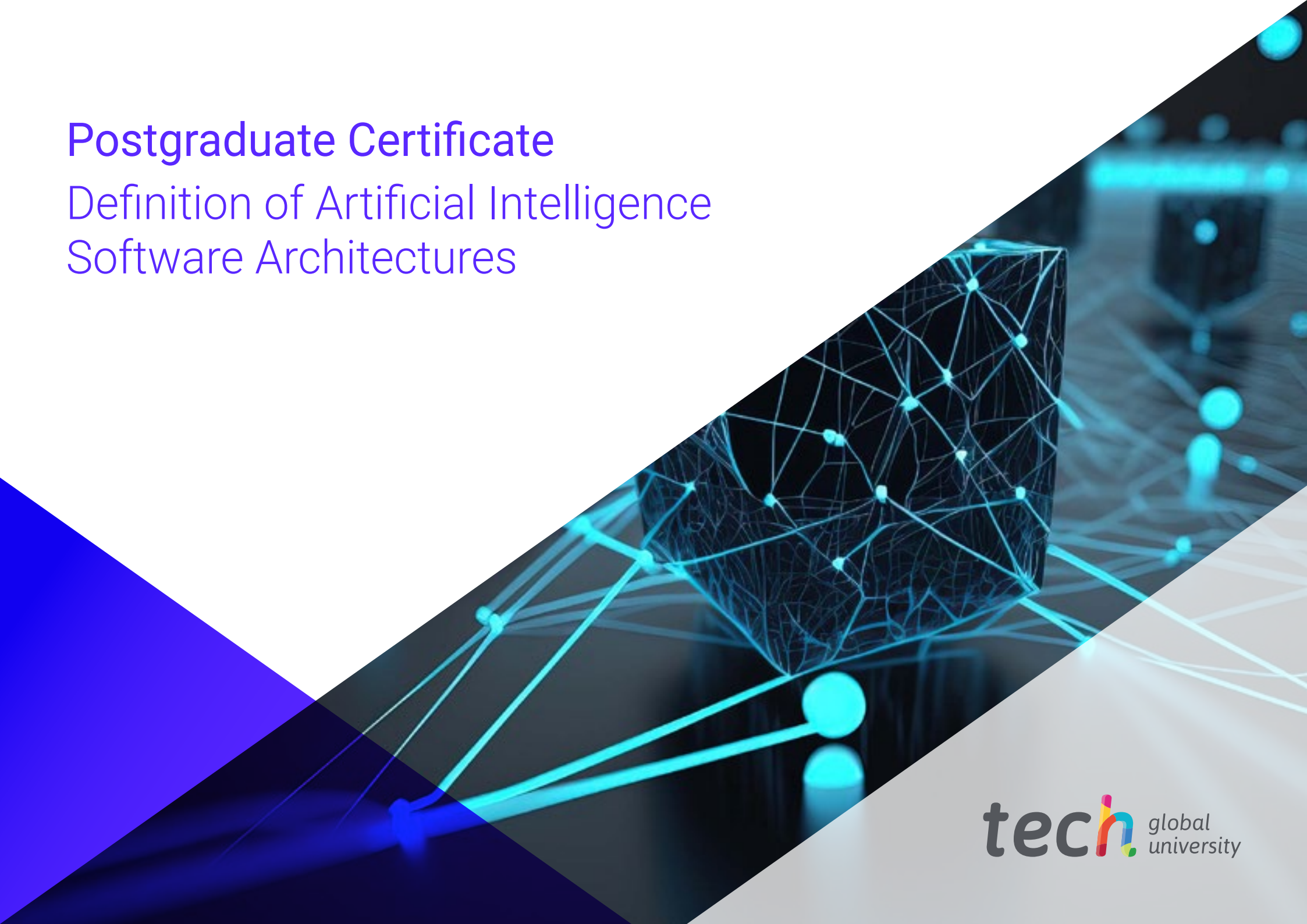
Postgraduate Certificate

Definition of Artificial Intelligence Software Architectures



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