Postgraduate Certificate
Definition of Software Architectures with Artificial Intelligence

tech technological university

Postgraduate Certificate
Definition of Software Architectures with Artificial Intelligence

» Modality: **online**
» Duration: **6 weeks**
» Certificate: **TECH Technological University**
» Schedule: **at your own pace**
» Exams: **online**

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

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01
Introduction

Documentation strategies specific to Artificial Intelligence (AI) models and algorithms are fundamental for several important purposes. Foremost among them is that it helps to explain how Machine Learning algorithms work in a clear way. This facilitates the communication process between development team members and non-technical stakeholders. Similarly, such information serves as useful references for the ongoing maintenance of the model. Therefore, when changes need to be made, teams can quickly understand how it is structured and how it has been trained. For this reason, TECH implements a qualification that will thoroughly analyze the maintainability of AI applications. In addition, it is delivered through a convenient 100% online methodology for greater student flexibility.

" *With the Relearning system you will integrate the concepts in a natural and progressive way. Forget about memorizing!"*

The Definition of Software Architectures using Machine Learning has become an essential process in system development. These mechanisms define both the structure and the design of the software that will enable the integration and deployment of the algorithms in the applications. Importantly, these structures provide the basis for AI integration, management, security and performance in the context of a broader solution. In this way, organizations take full advantage of the potential of Artificial Intelligence and use it to improve their decision making.

Given this reality, TECH is developing a Postgraduate Certificate aimed at IT professionals that will examine in depth Software Architecture through AI. The academic itinerary will delve into the optimization and performance management in tools with Machine Learning. This will allow professionals to implement both caching and parallelization techniques to improve performance. At the same time, the program will address the design of large-scale systems, taking into account their architectural principles and implementation of specific patterns for distributed systems. The program will also examine scheduling algorithms for products, offering selection strategies according to the type of problem and item requirements.

The program has the avant-garde and exclusive Relearning methodology so that students can assimilate complex concepts and competences in a fast and flexible way. At the same time, its contents are not subject to rigid schedules or continuous evaluation schedules. In this way, each student has the opportunity to personalize study time in accordance with their personal or professional obligations. This way, you will not have to abandon other academic programs or your current work, also avoiding unnecessary displacement. In short, all content will be accessible from any portable device 24 hours a day, 7 days a week.

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

- Development of practical cases presented by experts in Artificial Intelligence in Programming
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable for professional practice
- Practical exercises where the self-assessment process can be carried out 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

Do you want to implement Clean Architecture to your procedures? This program will allow you to create highly maintainable, scalable and flexible applications"

" *You will apply the most effective strategies for horizontal and vertical expansion in environments with variable demand"*

You will manage workflows and workloads in scalable systems in just 6 weeks thanks to this training.

You will have at your disposal a library full of multimedia resources in different audiovisual formats, including interactive summaries.
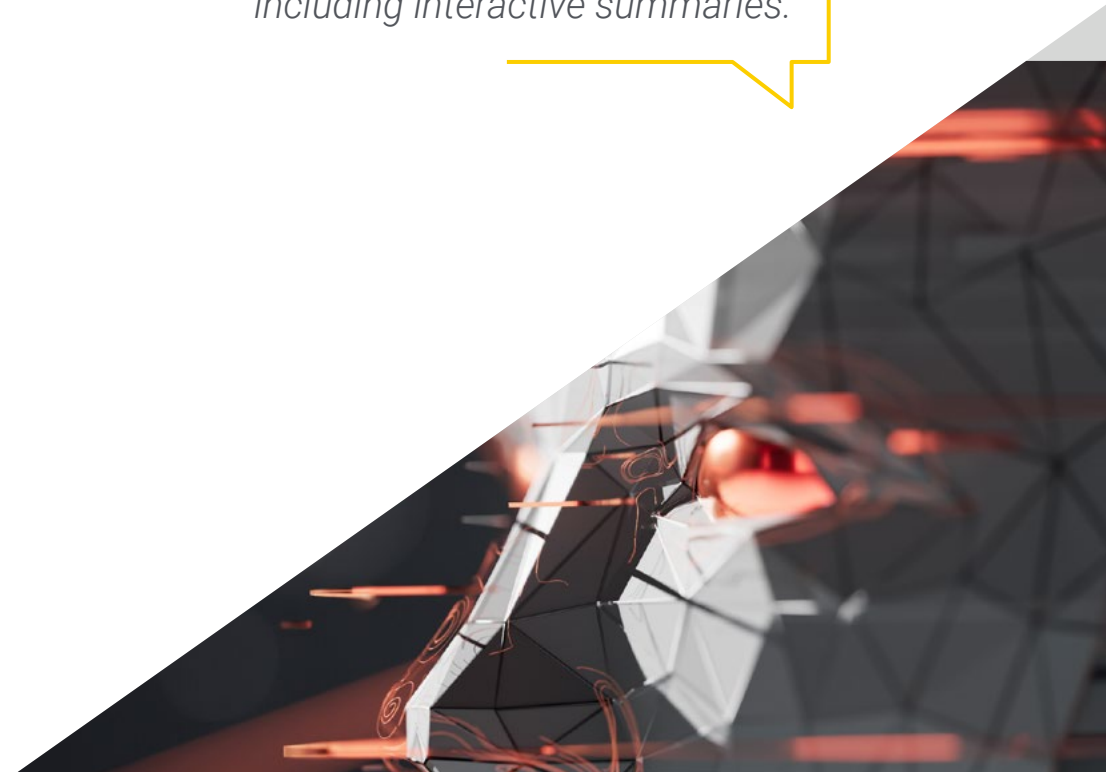
The program's teaching staff includes professionals from the sector who contribute their work experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

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 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 course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

02
Objectives

This Postgraduate Certificate will provide computer scientists with a solid understanding that will enable them to design computer systems characterized by their scalability and handling of big data. Therefore, graduates will implement the most innovative tools of data structures powered by Machine Learning to their usual procedures. Along these lines, professionals will be able to improve software performance and efficiency. In line with this, the specialists will apply practices designed to ensure secure development and thus avoid vulnerabilities such as injection. Experts will be characterized by endorsing the well-being of users by protecting their personal data.

"A complete and cutting-edge program that will allow you to advance in a progressive and complete way, from the comfort of your home"

General Objectives

- Develop skills to configure and manage efficient development environments, ensuring a solid foundation for the implementation of AI projects

- Acquire skills in planning, executing and automating quality testing, incorporating AI tools for bug detection and correction

- 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 complete syllabus that incorporates all the knowledge you need to take a step towards maximum IT quality"

tech

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 vision 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
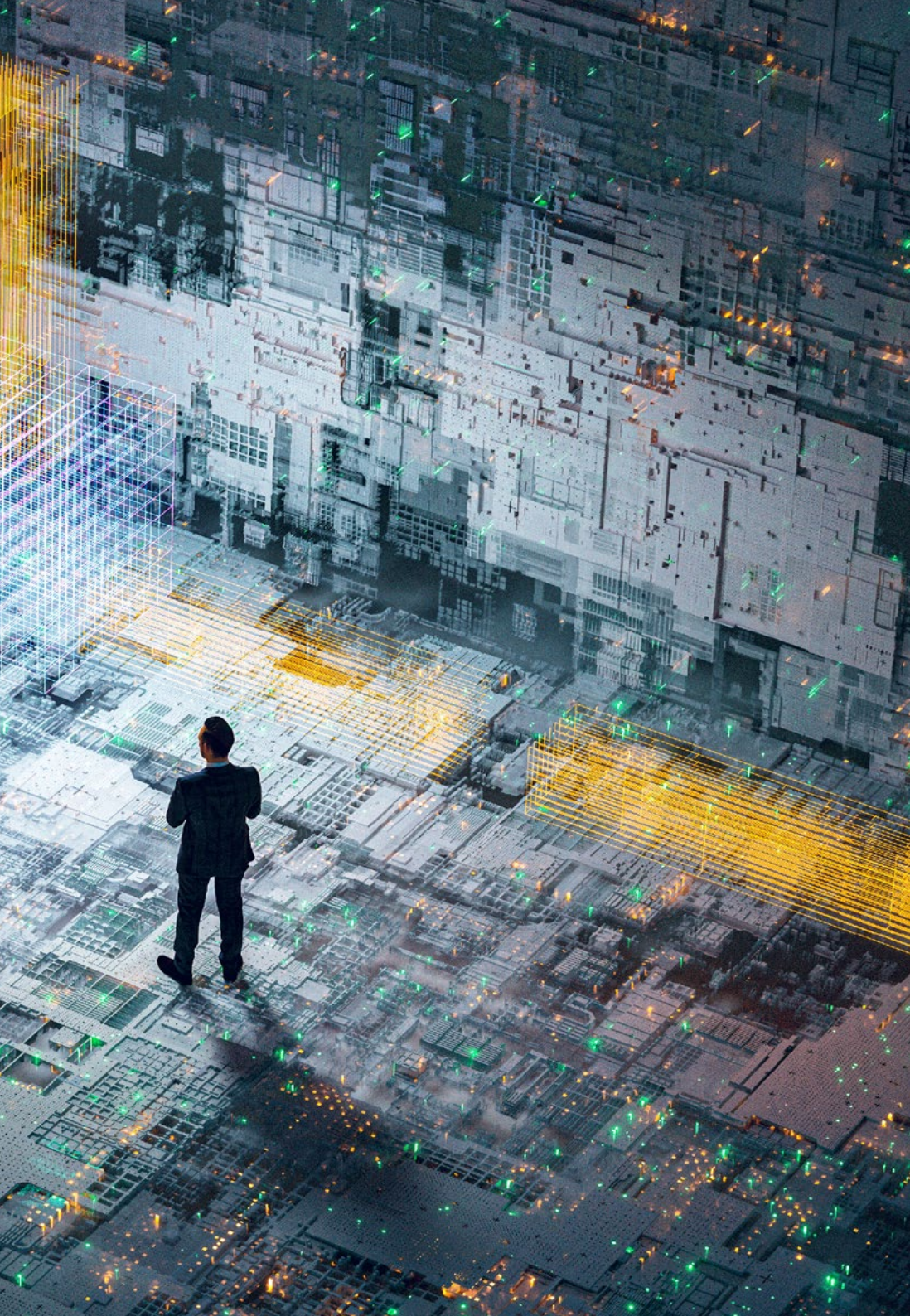
03
Course Management

For the design and delivery of this university degree, TECH has assembled an excellent teaching team made up of professionals with extensive professional experience in the technological field, especially in Software Architecture Definition with AI. Therefore, graduates are guaranteed to have access to the most current information in line with the real needs of the industry. In addition, thanks to their proximity, graduates will be able to resolve any doubts they may have about the content of this program.

"
An experienced teaching staff will guide you throughout the learning process and will resolve any doubts you may have"

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
- PhD. in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- PhD 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
- Specialist in Computer Systems Engineering and Machine Learning Engineer
- Freelance Technical Consultant
- Mobile Applications Developer for eDreams, Fnac, Air Europa, Bankia, Cetelem, Banco Santander, Groupón and Grupo Planeta
- Web Developer for Openbank and Banco Santander
- Technical Engineer in Computer Systems from the University of Castilla la Mancha.

04
Structure and Content

This university program will immerse students in the fundamental aspects of Software Architecture through AI. The curriculum will analyze key factors such as performance, stability and maintainability. In addition, the syllabus will delve into the selection of scalable data storage technologies, so that graduates can efficiently handle large volumes of data. In addition, the didactic materials will address the implementation of Clean Architecture, bearing in mind its principles and adaptation to projects with AI components. The program will also explore design patterns and promote safe development practices to train highly competent computer scientists.
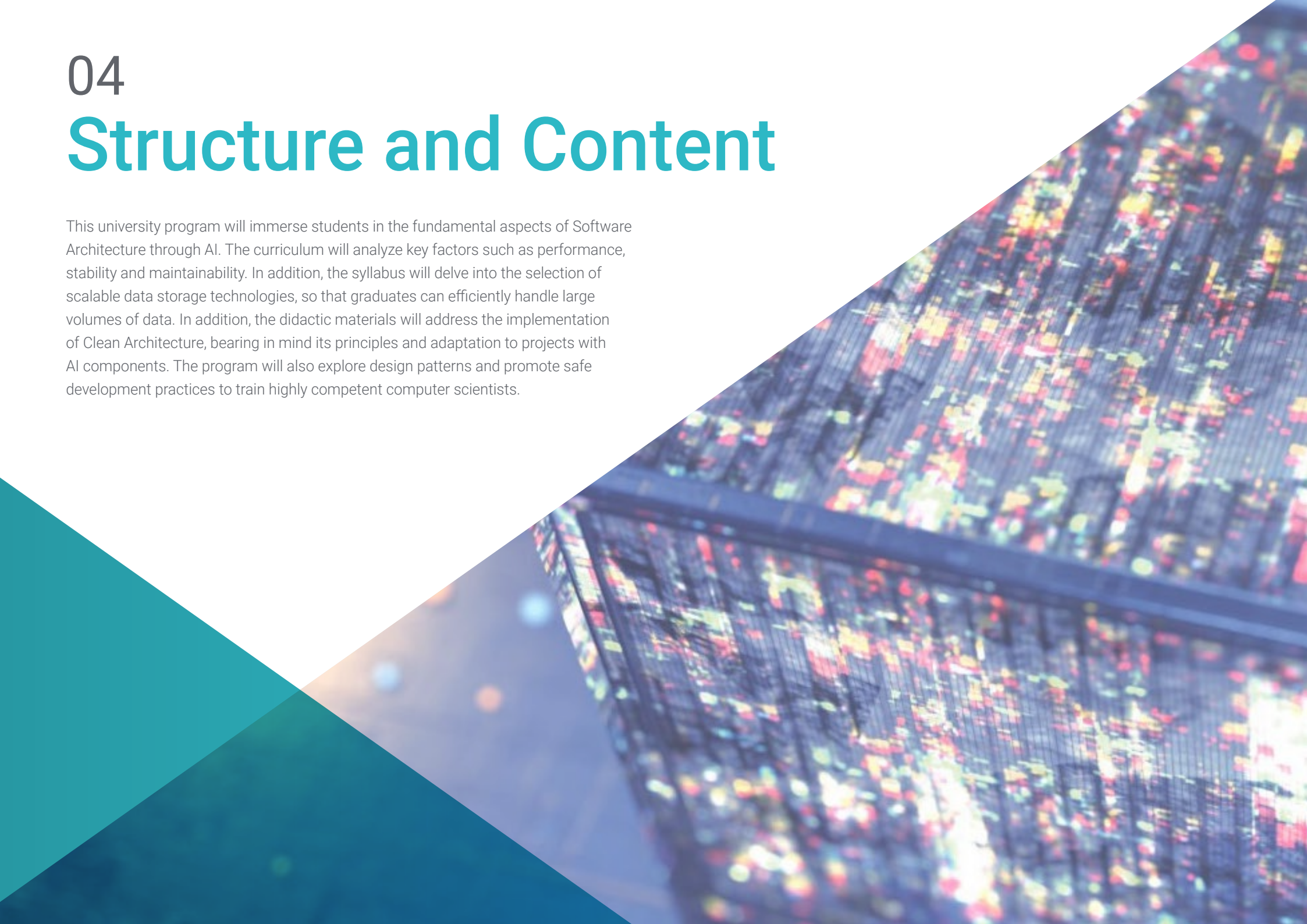
You will nurture your computing praxis with the most advanced programming algorithms for product creation using Machine Learning"

Module 1. Software Architecture with AI

1.1. Optimization and Performance Management in AI Tools with the Help of ChatGPT
  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 Using ChatGPT
  1.2.1. calable Architectures Design for AI Applications
  1.2.2. Implementation of Partitioning and Load Sharing Techniques
  1.2.3. Workflow and Workload Management in Scalable Systems
  1.2.4. Strategies for Horizontal and Vertical Expansion in Variable Demand Environments
1.3. Maintainability of AI Applications Using ChatGPT
  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 Maintainability
  1.3.4. Methods for Refactoring and Continuous Improvement in Systems with AI Components
1.4. Large-Scale System Design
  1.4.1. Architectural Principles for Large-Scale System Design
  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 Storage Technologies
  1.5.2. Design of Database Schemas for Efficient Handling 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 Using ChatGPT

   1.6.1.   Adaptation of Classical Data Structures for Use with AI Algorithms

   1.6.2.   Design and Optimization of Specific Data Structures with ChatGPT

   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 Type and Product Requirements

   1.7.3.   Adaptation of Classical Algorithms for Integration into AI Systems

   1.7.4.   Evaluation and Performance Comparison between Different Algorithms in Development Contexts with AI

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.   Strategies for the Implementation of Patterns to Improve 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 using ChatGPT

   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 Software Development with AI

1.10.   Secure Software Development in Web Applications with DeepCode

   1.10.1.   Principles of Security in the Development of Software with AI Components

   1.10.2.   Identification and Mitigation of 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

Access the multimedia resources library and the entire syllabus from day one. No fixed schedules or attendance!"

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.

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.

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

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.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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:
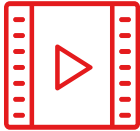
Study Material

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.

30%

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.

10%

### 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.

8%

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.

20%

25%

4%

3%
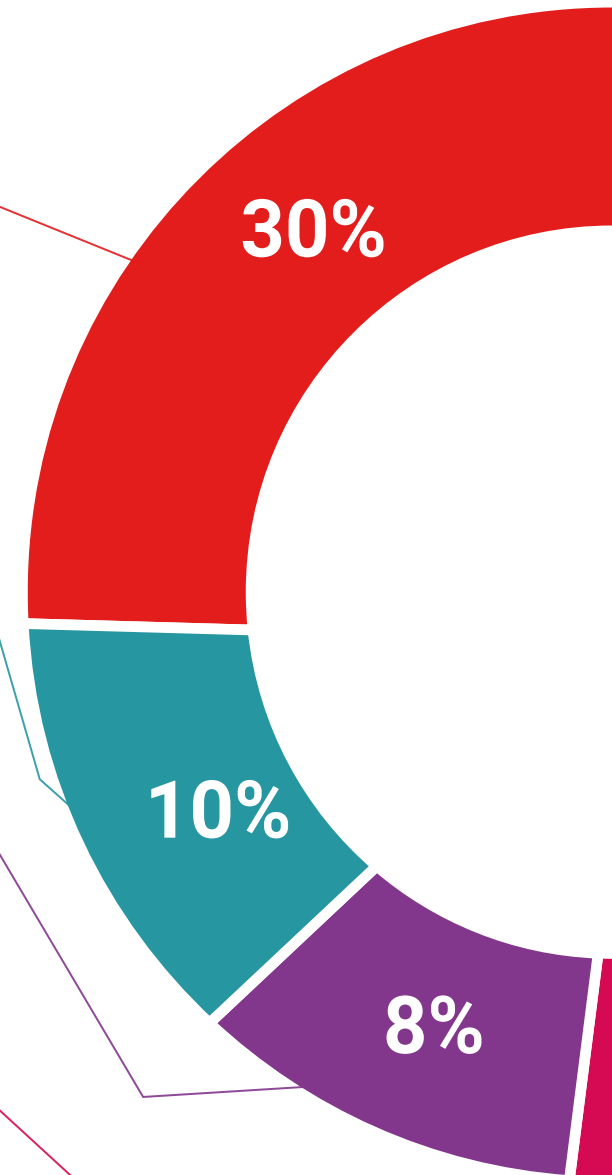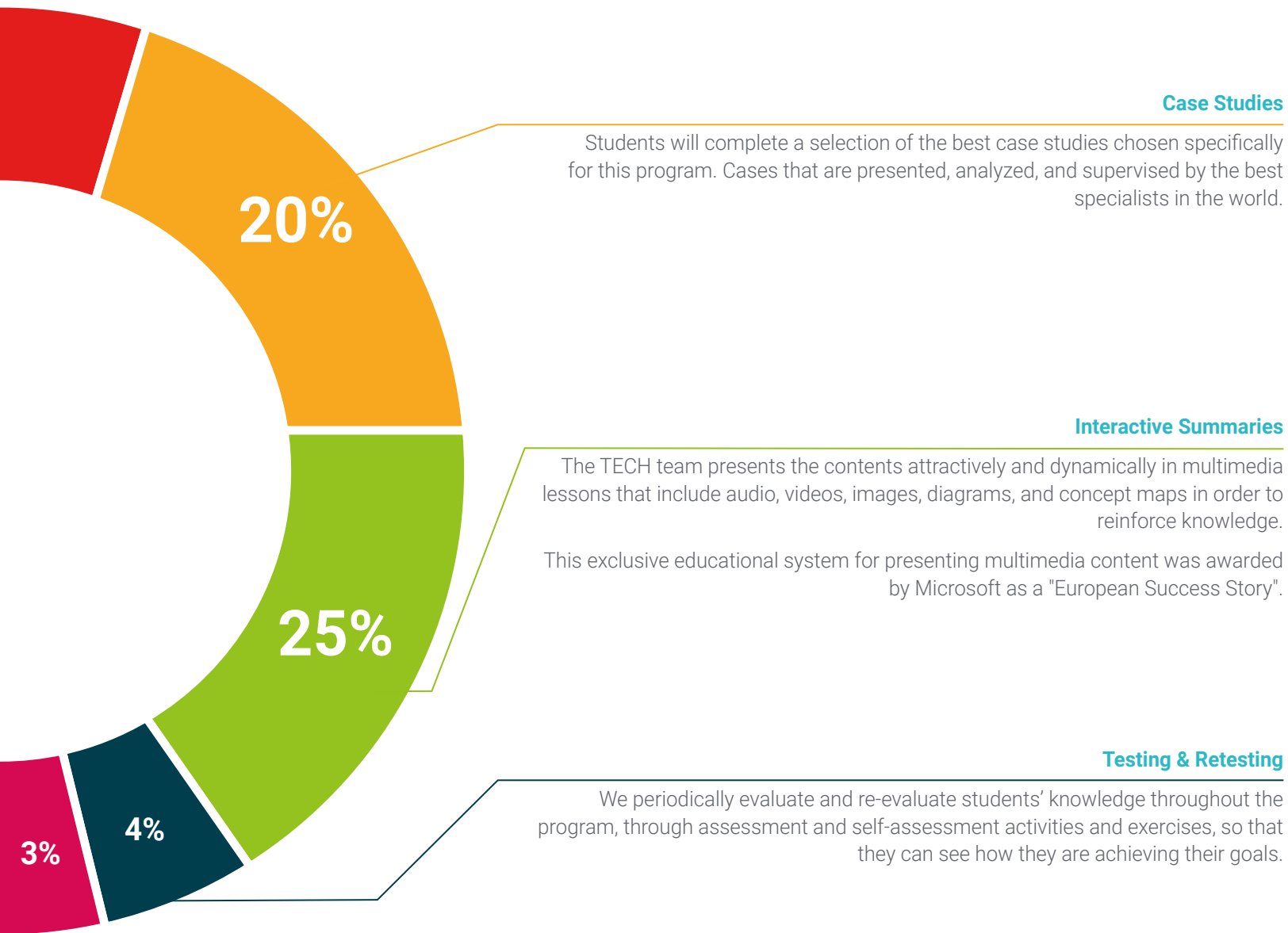
Case Studies

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 Software Architectures with Artificial Intelligence 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 Definition of Software Architectures with Artificial Intelligence** contains the most complete and up-to-date scientific 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 diploma 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 Definition of Software Architectures with Artificial Intelligence**

Modality: **Online**

Duration: **6 weeks**

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Awards the following
DIPLOMA
to
Mr./Ms. _____, with identification number _____.
For having passed and accredited the following program

POSTGRADUATE CERTIFICATE
in
Definition of Software Architectures with Artificial Intelligence

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

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 EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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Postgraduate Certificate
Definition of Software Architectures with Artificial Intelligence

- » Modality: **online**
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- » Schedule: **at your own pace**
- » Exams: **online**

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