

Postgraduate Certificate

Parallel Architectures in Computing



Postgraduate Certificate Parallel Architectures in Computing

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

Website: www.techtute.com/us/information-technology/postgraduate-certificate/parallel-architectures-computing

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01

Introduction

Parallel computing has been used in software systems for many years, with an ever-increasing proliferation of such architectures to squeeze the maximum performance out of all types of computers. In this context, an urgent need arises to measure and compare the performance of software, algorithms and parallel architectures, in order to analyze the performance of the set of components involved. Here arises an indispensable opportunity for the computer scientist to delve deeper into parallel architecture, because with a more detailed knowledge of it they will be able to focus their career on the evaluation of parallel computing systems. To this end, this Postgraduate Certificate offers an exhaustive and comprehensive syllabus, designed by a teaching team with extensive experience and offered in a completely online format, convenient and flexible for the student.



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Master the effective programming of parallel systems by delving into superscalar Multithreaded processors, Multicore, multiprocessor systems and processors with vector units, among other types of architectures”

Programming systems with parallel architectures can be a challenge for computer scientists, who must develop their ability to evaluate and analyze the performance of systems incorporating this technique. To do so, we must delve into the requirements of parallel computing systems, such as coherence in systems with shared memory, the cost of communication between processes or the topologies of interconnection between processors, with their advantages and disadvantages.

This Postgraduate Certificate explores all these issues and expands on them in detail with simulated case studies and a myriad of high-quality audiovisual resources created by the teaching team itself. Precisely this team has been selected by TECH for its extensive experience in the management and creation of complex parallel architectures, which brings practical value to all the topics covered, as they have been focused on the current reality of the most modern IT projects.

In addition, to make it as easy as possible to combine this degree with other personal responsibilities, TECH has promoted a 100% online format, in which the student does not have to attend classes or follow any kind of schedule. All the contents and didactic material are available from the beginning of the degree, and can be downloaded in full from any device with an internet connection. In this way, it is the student themselves who distributes the teaching load, without pressure or ties.

This **Postgraduate Certificate in Parallel Architectures in Computing** is the most comprehensive and up-to-date educational program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Parallel and Distributed Computing
- ◆ The graphic, schematic and eminently practical contents with which it is conceived provide practical information on those 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 for experts and individual reflection work
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



You make the important decisions at TECH, choosing where, when and how to take on the entire teaching load according to your own interests"

“

Incorporate into your daily work the practical advice of a teaching team versed in Parallel Computing Architectures, while improving your skills and job potential"

It analyzes the theory and advanced practice of vector, matrix and multiprocessor processors, with topics dedicated exclusively to them.

Enroll today in the world's largest online academic institution and don't miss the opportunity to specialize in an IT area with a great future projection.

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.

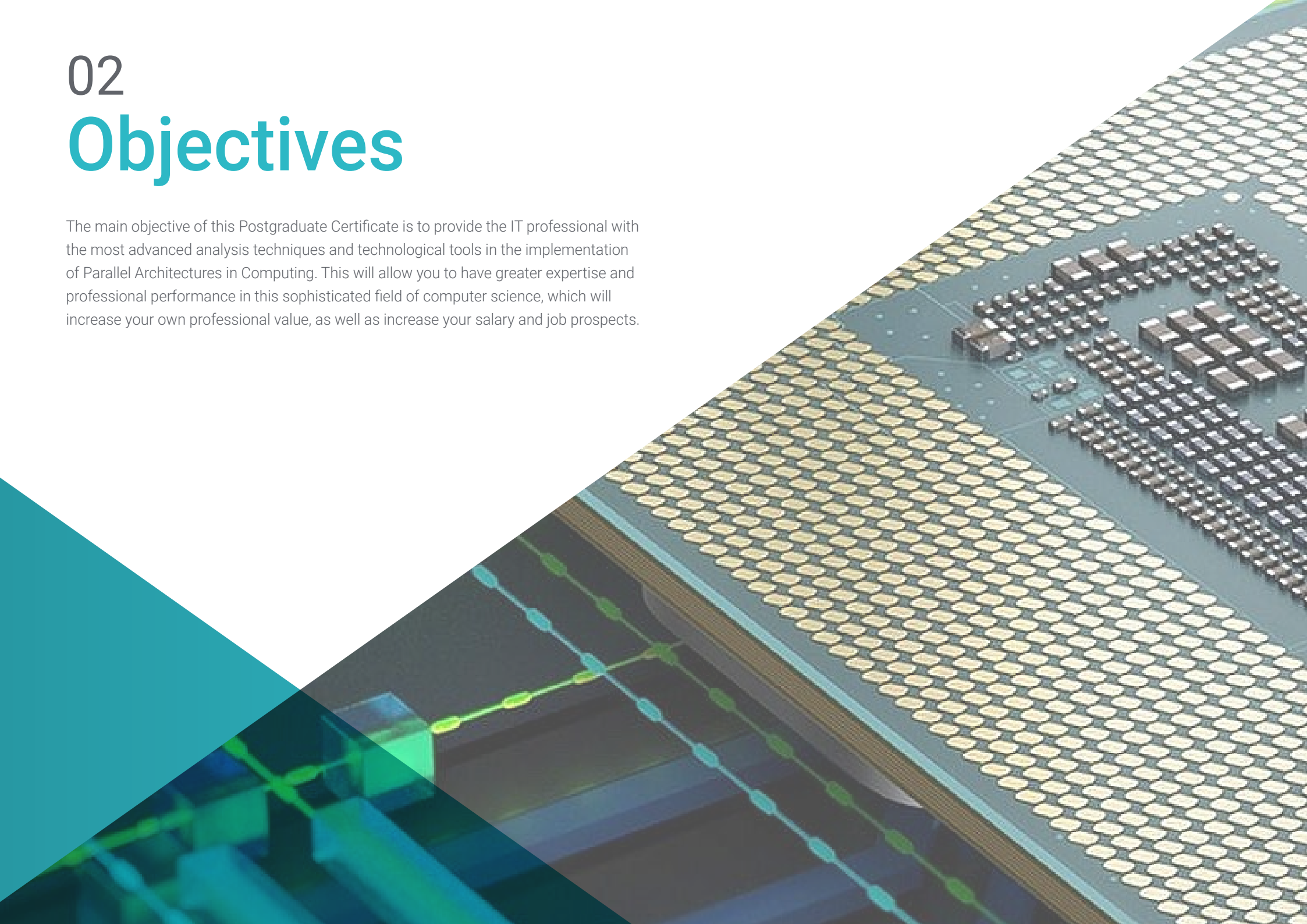
The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive training programmed to train in real situations.

This program is designed around Problem-Based Learning, whereby the professional must try to solve the different professional practice situations that arise during the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.



02 Objectives

The main objective of this Postgraduate Certificate is to provide the IT professional with the most advanced analysis techniques and technological tools in the implementation of Parallel Architectures in Computing. This will allow you to have greater expertise and professional performance in this sophisticated field of computer science, which will increase your own professional value, as well as increase your salary and job prospects.



“

You will have a more specific understanding of Parallel Architectures thanks to all the contents of this Diploma, giving a boost to your IT career"



General Objectives

- ◆ Analyze the main computer architectures
- ◆ Deepen in key aspects such as process, service and execution threads
- ◆ Manage running processes in an operating system
- ◆ Use classes to launch and manage processes



You will achieve your most ambitious professional goals thanks practical and useful approach of this Postgraduate Certificate"





Specific Objectives

- ◆ Develop Parallel Architectures
- ◆ Address the performance of parallel systems
- ◆ Examine vector and matrix processes
- ◆ Deepen in advanced architectures
- ◆ Analyze parallel and distributed programming, programming languages, tools and design patterns

03

Course Management

TECH has selected a teaching staff with extensive professional experience, developed in the most cutting-edge companies and projects in the IT sector. Thus, the student is being taught by a teaching team with a great work success, being able to delve into the keys and most important steps of the most complex Parallel Computing Architectures. The teaching staff also possesses an innate human quality, as they are 100% committed to the professional improvement of the students.



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Consult all your doubts about Parallel Architectures in Computing directly with the teachers, receiving a personalized tutorial"

Management



Mr. Olalla Bonal, Martín

- ◆ Technical Sales Blockchain Specialist in IBM
- ◆ Blockchain Hyperledger and Ethereum Architecture Manager at Blocknitive
- ◆ Director of the Blockchain area at PSS Information Technologies
- ◆ Chief Information Officer in ePETID – Global Animal Health
- ◆ IT Infrastructure Architect at Bankia - wdoIT (IBM - Bankia Join Venture)
- ◆ Project Director and Manager in Daynet Servicios Integrales
- ◆ Director of Technology at Wiron Construcciones Modulares
- ◆ Head of IT Department at Dayfisa
- ◆ Head of IT department at Dell Computer, Majsja and Hippo Viajes
- ◆ Electronics Technician in IPFP Juan de la Cierva

Professors

Mr. Bernal de la Varga, Yeray

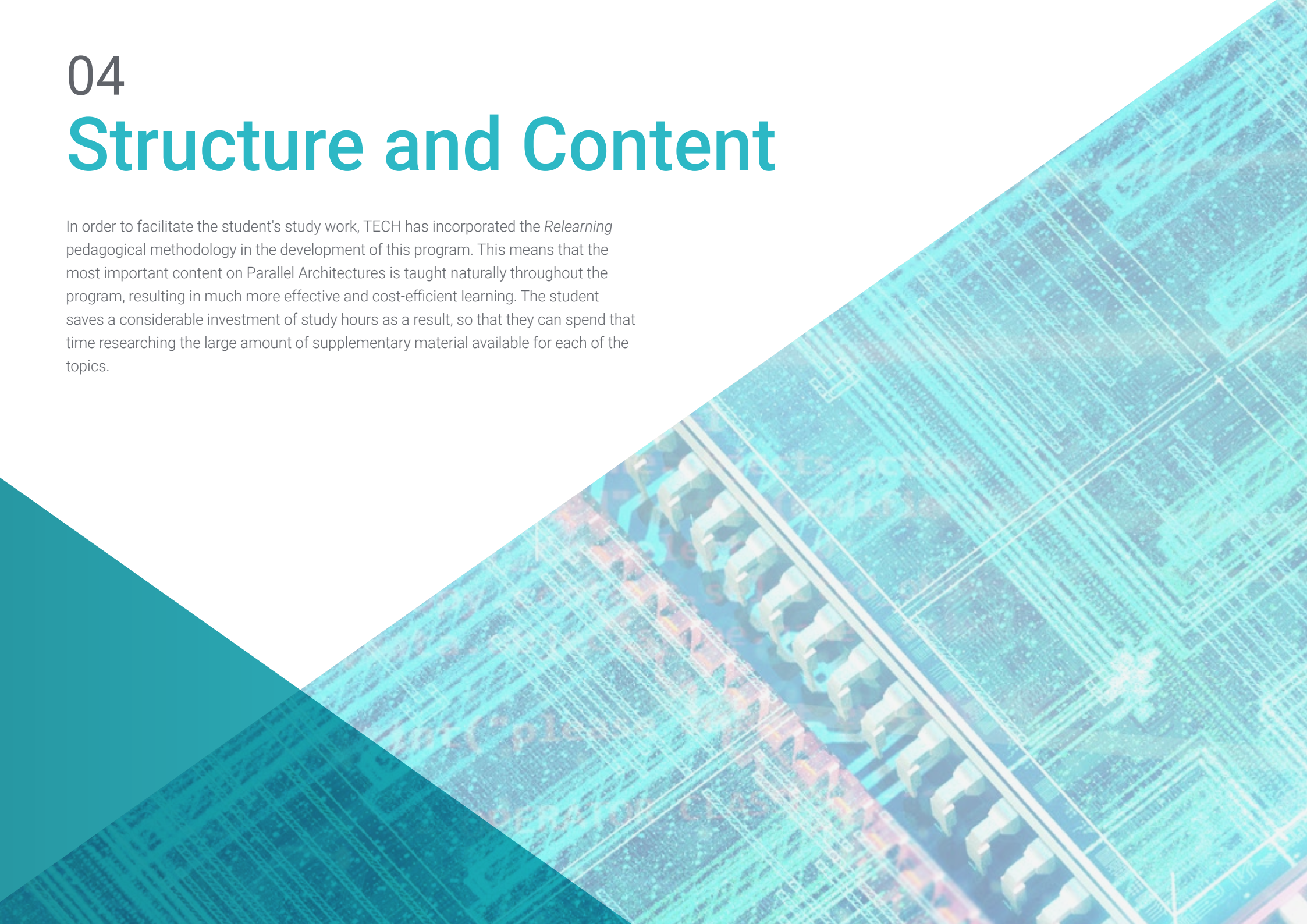
- ◆ Big Data Solutions Architect at Orange Bank
- ◆ Big Data Architect at Bankia
- ◆ Big Data Engineer at Hewlett-Packard
- ◆ Adjunct Professor in the Master of Big Data at the University of Deusto
- ◆ Graduated in Computer medicine from the Polytechnic University of Madrid
- ◆ Expert in Big Data bu the U-TAD



04

Structure and Content

In order to facilitate the student's study work, TECH has incorporated the *Relearning* pedagogical methodology in the development of this program. This means that the most important content on Parallel Architectures is taught naturally throughout the program, resulting in much more effective and cost-efficient learning. The student saves a considerable investment of study hours as a result, so that they can spend that time researching the large amount of supplementary material available for each of the topics.



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You will have access to the virtual classroom 24 hours a day, being able to download all the content from the very beginning of the program"

Module 1. Parallel Architectures

- 1.1. Parallel Architectures
 - 1.1.1. Parallel Systems Classification
 - 1.1.2. Parallelism Sources
 - 1.1.3. Parallelism and Processors
- 1.2. Performance of Parallel Systems
 - 1.2.1. Performance Measures and Quantities
 - 1.2.2. *Speed-up*
 - 1.2.3. Granularity of Parallel Systems
- 1.3. Vectorial Processors
 - 1.3.1. Basic Vectorial Processor
 - 1.3.2. Interleaved or Interleaved Memory
 - 1.3.3. Performance of Vector Processors
- 1.4. Matrix Processors
 - 1.4.1. Basic Organization
 - 1.4.2. Programming in Matrix Processors
 - 1.4.3. Programming in Matrix Processors Practical Example
- 1.5. Interconnection Networks
 - 1.5.1. Interconnection Networks
 - 1.5.2. Topology, Flow Control and Routing
 - 1.5.3. Interconnection Networks Classification According to Topology
- 1.6. Multiprocessors
 - 1.6.1. Multiprocessor Interconnection Networks
 - 1.6.2. Memory and Cache Consistency
 - 1.6.3. Probe Protocols
- 1.7. Synchronization
 - 1.7.1. Bolts (Mutual Exclusion)
 - 1.7.2. P2P Synchronization Events
 - 1.7.3. Global Synchronization Events
- 1.8. Multicomputers
 - 1.8.1. Multicomputer Interconnection Networks
 - 1.8.2. Switching Layer
 - 1.8.3. Routing Layer



- 1.9. Advanced Architectures
 - 1.9.1. Data Flow Machines
 - 1.9.2. Other Architectures
- 1.10. Parallel and Distributed Programming
 - 1.10.1. Parallel Programming Languages
 - 1.10.2. Parallel Programming Tools
 - 1.10.3. Design Patterns
 - 1.10.4. Concurrency of Parallel and Distributed Programming Languages

“*You will have a widely developed and exhaustive reference material on Parallel Architectures, which will be useful even after the end of the degree”*

05 Methodology

This training program offers a different way of learning. Our methodology uses a cyclical learning approach: ***Re-learning***.

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 Re-learning, 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"

At TECH we use the Case Method

Our program offers a revolutionary method of skills and knowledge development. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

“

At TECH, you will experience a way of learning that is shaking the foundations of traditional universities around the world"



We are the first online university to combine Harvard Business School case studies with a 100% online learning system based on repetition.



A learning method that is different and innovative.

This intensive Information Technology program at TECH Global University prepares you to face all the challenges in this field, both nationally and internationally. We are committed to promoting your personal and professional growth, the best way to strive for success, that is why at TECH Global University you will use Harvard *case studies*, with which we have a strategic agreement that allows us, to offer you material from the best university in the world.

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Our program prepares you to face new challenges in uncertain environments and achieve success in your career”

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

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.

Re-learning Methodology

Our university is the first in the world to combine Harvard University case studies with a 100%-online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance Harvard case studies with the best 100% online teaching method: Re-learning.

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 Re-learning.

Our university is the only university 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.

Re-learning 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 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

They will complete a selection of the best case studies in the field used at Harvard. Cases that are presented, analyzed, and supervised by the best senior management 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 multimedia content presentation training Exclusive system 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 your goals.



06 Certificate

The Postgraduate Certificate in Parallel Architectures in Computing 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 training program and receive your diploma without travel or laborious paperwork"

This program will allow you to obtain your **Postgraduate Certificate in Parallel Architectures in Computing** 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.

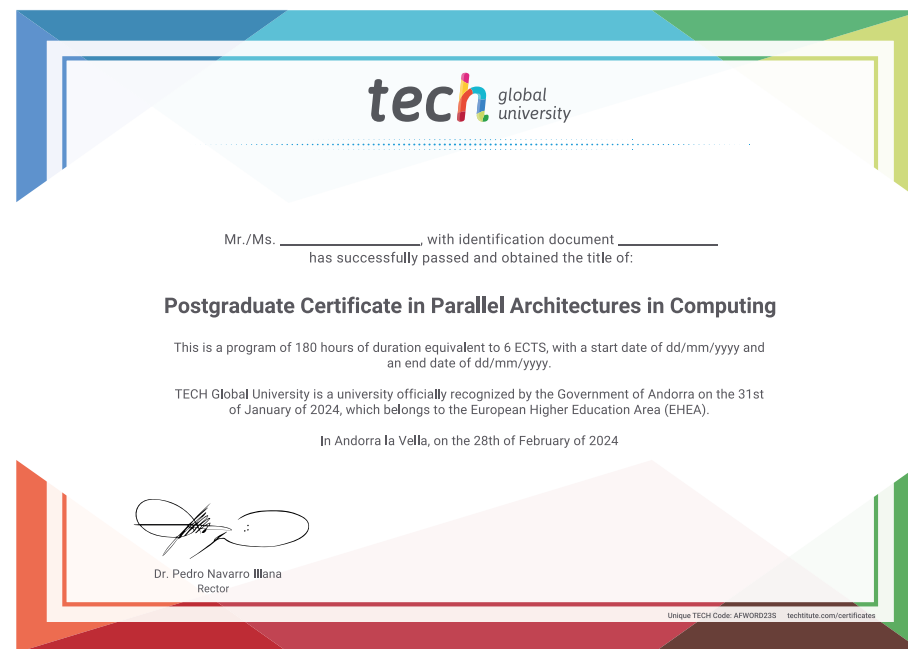
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Parallel Architectures in Computing**

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
knowledge present quality
online
development languages
classroom



Postgraduate Certificate

Parallel Architectures in Computing

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

Postgraduate Certificate

Parallel Architectures in Computing