

Postgraduate Certificate

Parallelism in Parallel and Distributed Computing



Postgraduate Certificate Parallelism in Paralel and Distributed 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/parallelism-paralel-distributed-computing

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

To understand the depth of parallel computing, it is essential to first comprehend the key aspects that govern parallelism, both in parallel systems and in the architecture of processors operating in this manner. Hence, this program initially explores parallel systems, architectures, and processing, and subsequently delves into the performance of parallel computing itself and the various forms of parallelism. The syllabus, authored by professionals with extensive experience in large-scale IT projects, provides an excellent entry point into Parallel and Distributed Computing with a comprehensive theoretical and practical approach at the highest level.



“

Delve into the different ways of the current parallelism: TLP, DLP, and ILP, with all their features and secrets unraveled to the smallest detail”

Every computer scientist knows that success in their profession depends, to a large extent, on their own ability to adapt to a constantly changing environment. The evolution of processing in recent years, both in terms of hardware and software, has been remarkable. Supercomputers are becoming more powerful and faster, and anyone can have access to the cloud or to devices with parallel processing capabilities.

This provides a significant advantage to computer scientists who are prepared and well-versed in Parallel and Distributed Computing. This applies to their own entrepreneurial software development projects as well as research and academic fields, where they can study new forms of processing and computational architectures.

To begin exploring these topics, it is essential to have a strong and well-founded understanding of Parallel and Distributed Computing, particularly parallelisms and their various implementation forms. The computer scientists will delve into all these details and specific issues in 10 exhaustive topics, providing essential knowledge to delve into Parallel and Distributed Computing.

The format program is 100% online, which means that there are no classes or established schedules. The students decide how to distribute the teaching load, which is a decisive advantage for balancing this degree with other personal and professional responsibilities.

This **Postgraduate certificate in Parallelism in Parallel and Distributed Computing** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ The program includes the development of case studies presented by experts in Parallel and Distributed Computing
- ◆ The program is designed with graphical, schematic, and highly practical content, which gathers essential information about disciplines that are crucial for the professional practice
- ◆ Practical exercises where self-assessment can be used to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ The program incorporates theoretical lessons, interactive question-and-answer sessions with experts, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



Get the career boost you're looking for and enroll in a program created by computer experts with a great reputation and a track record of success”

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Enroll today and seize the opportunity to deepen and modernize your knowledge in the technology of the present and future, Parallel and Distributed Computing”

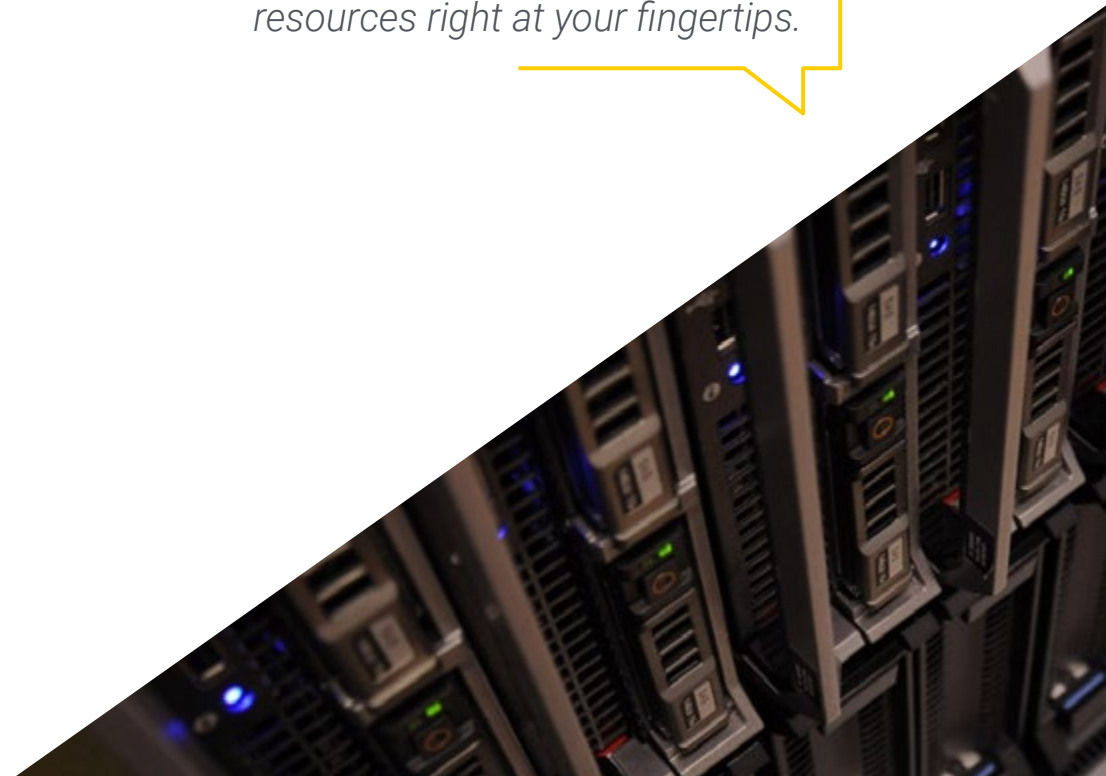
The teaching staff of the program consists of professionals from the industry who bring their valuable work experience to the table. Additionally, renowned specialists from leading societies and prestigious universities contribute their expertise to enrich the program.

The program's multimedia content, created using state-of-the-art educational technology, enables professionals to learn in a contextual and situated learning environment. This simulated environment offers immersive education specifically designed to prepare individuals for real-world situations.

The program's design emphasizes Problem-Based Learning, requiring professionals to actively solve various real-world practice situations that are presented to them throughout the academic year. For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

You will learn about performance measures that govern parallel computing, as well as the most common networks and architectures.

Join the world's largest online academic institution, offering the best educational and technological resources right at your fingertips.



02 Objectives

Given that parallel computing can be a rapidly growing field for computer professionals, this certificate aims to provide students with the necessary foundations in parallelism to enter this specialized area with a strong foundation. To achieve this, students will find a wealth of supplementary resources, including additional readings and practical exercises, to reinforce all the knowledge imparted.



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You will have a dedicated teaching team at your disposal, committed to supporting you and helping you achieve your goals. They will be ready to answer any questions you may have along the way”



General Objectives

- ◆ Analyze the different components of Parallel and Distributed Computing
- ◆ Measure and compare their efficiency to analyze the performance of the set of components used
- ◆ Conduct a thorough analysis of multi-platform parallel computing to leverage task-level parallelism across different hardware accelerators
- ◆ Analyze in detail current software and architectures
- ◆ Develop in depth the relevant aspects of Parallel and Distributed Computing
- ◆ Specialize the students in the application of Parallel and Distributed Computing across various industry sectors





Specific Objectives

- ◆ Analyze the processing components: processor or memory
- ◆ Delve into the Parallelism Architecture
- ◆ Analyze the different forms of Parallelism from the point of view of the Processor

“

At the end of the program, you will have acquired the necessary knowledge to further explore the parallelisms in Parallel and Distributed Computing. You will have a solid foundation to delve deeper into this field and continue expanding your expertise”

03

Course Management

Given the highly specialized nature of the subject matter, TECH has assembled a team of professionals with vast experience in diverse IT teams and projects. With a strong emphasis on Parallel and Distributed Computing throughout their careers, computer scientists will value the quality of all the texts, exercises, and instructional videos provided due to the team's expertise and experience in the field.





“

You will be guided by professionals who possess firsthand knowledge of the current market reality in Parallel and Distributed Computing”

Management



D. Olalla Bonal, Martín

- ♦ Senior Blockchain Practice Manager at EY
- ♦ Blockchain Client Technical Specialist for IBM
- ♦ Director of Architecture for Blocknitive
- ♦ Non-Relational Distributed Databases Team Coordinator for wedoIT (IBM Subsidiary)
- ♦ Infrastructure Architect at Bankia
- ♦ Head of Layout Department at T-Systems
- ♦ Department Coordinator for Bing Data Spain S.L

Professors

Dr. Carratalá Sáez, Rocío

- ♦ Researcher specialized in Computer Science
- ♦ Teacher in university studies related to Computer Science
- ♦ Doctorate in Computer Science, Jaume I University
- ♦ Graduate in Computational Mathematics from the Jaume I University
- ♦ Master's Degree in Parallel and Distributed Computing from the Polytechnic University of Valencia
- ♦ Specialization courses related to computer science, mathematics and tools for academic research



04

Structure and Content

In order to facilitate the student's learning techniques, TECH incorporates the relearning pedagogical methodology in its programs. Thanks to this, computer scientists acquire the most important concepts of parallelism naturally and progressively, without having to make a significant investment in study hours. This allows them to allocate more time to other complementary activities in the program, enabling them to acquire much deeper knowledge in the fields of study.

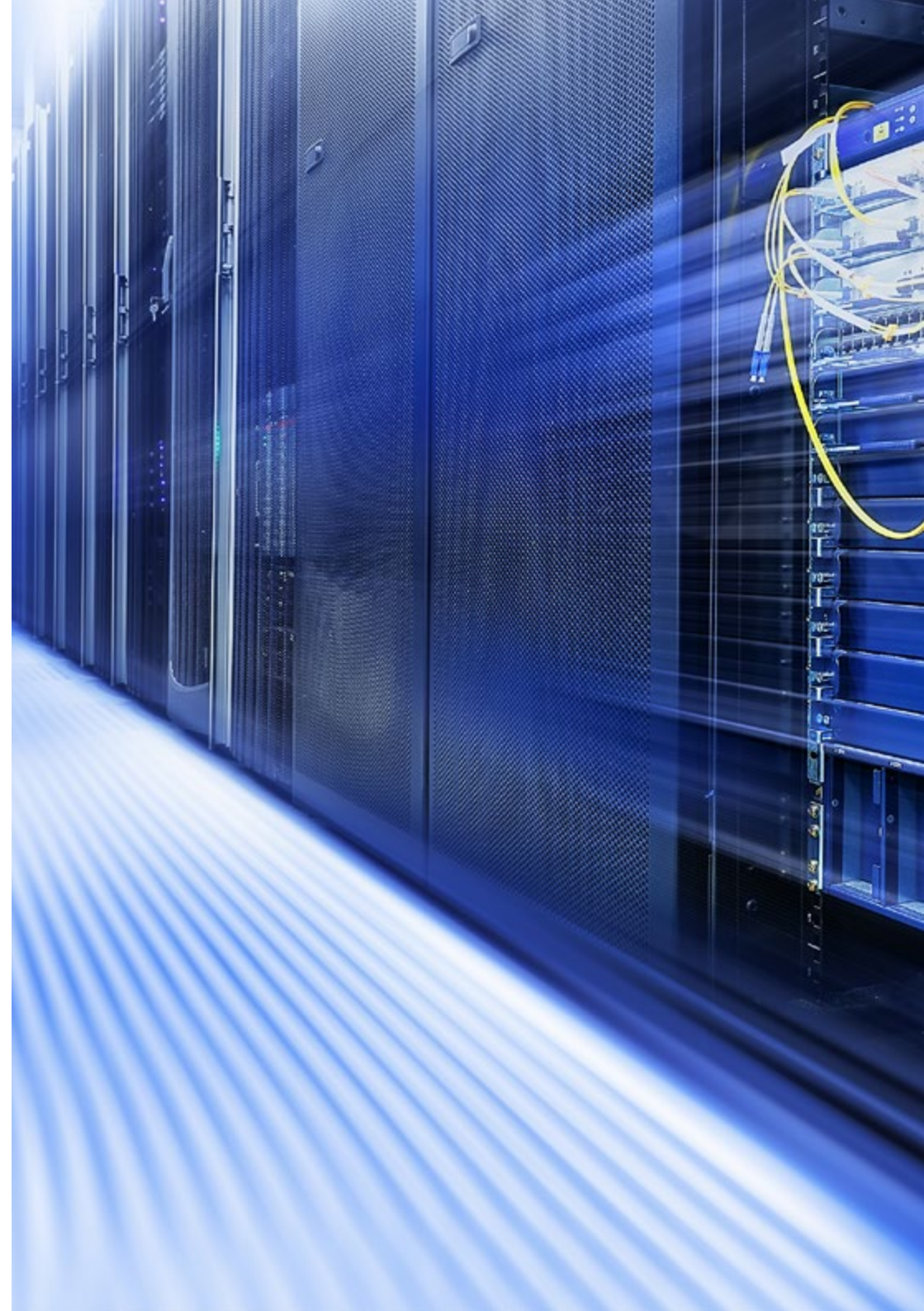


“

You will have access to a wide range of supplementary teaching materials, including videos created by the instructors themselves”

Module 1. Parallelism in Parallel and Distributed Computing

- 1.1. Parallel Processing:
 - 1.1.1. Parallel Processing:
 - 1.1.2. Parallel Processing in Computing. Purpose
 - 1.1.3. Parallel Processing: Analysis
- 1.2. Parallel System
 - 1.2.1. The Parallel System
 - 1.2.2. Levels of Parallelism
 - 1.2.3. Parallel System
- 1.3. Processor Architectures
 - 1.3.1. Processor Complexity
 - 1.3.2. Processor Architecture. Mode of Operation
 - 1.3.3. Processor Architecture. Memory Organization
- 1.4. Networks in Parallel Processing
 - 1.4.1. Mode of Operation
 - 1.4.2. Control Strategy
 - 1.4.3. Switching Techniques
 - 1.4.4. Topology
- 1.5. Parallel Architectures
 - 1.5.1. Algorithms
 - 1.5.2. Coupling
 - 1.5.3. Communication
- 1.6. Performance of Parallel Computing
 - 1.6.1. Performance Evolution
 - 1.6.2. Performance Measures
 - 1.6.3. Parallel Computing Study Cases
- 1.7. Flynn's Taxonomy
 - 1.7.1. MIMD: shared memory
 - 1.7.2. MIMD: distributed memory
 - 1.7.3. MIMD: Hybrid systems
 - 1.7.4. Data Flow



- 1.8. Forms of Parallelism: TLP (*Thread Level Paralelism*)
 - 1.8.1. Forms of Parallelism: TLP (*Thread Level Paralelism*)
 - 1.8.2. *Coarse grain*
 - 1.8.3. *Fine grain*
 - 1.8.4. SMT
- 1.9. Forms of Parallelism: DLP (*Data Level Paralelism*)
 - 1.9.1. Forms of Parallelism: DLP (*Data Level Paralelism*)
 - 1.9.2. *Short Vector Processing*
 - 1.9.3. *Vector Processors*
- 1.10. Forms of Parallelism: ILP (*Instruction Level Paralelism*)
 - 1.10.1. Forms of Parallelism: ILP (*Instruction Level Paralelism*)
 - 1.10.2. *Segmented Processors*
 - 1.10.3. *Superscalar Processor*
 - 1.10.4. *Very Long Instruction Word (VLIW) Processor*

“ *The virtual classroom will be available 24 hours a day, and can be accessed from any device with an internet connection”*

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 Parallelism in Paralel and Distributed Computing guarantees, in addition to the most rigorous and updated training, access to a Diploma degree issued by TECH Global University.



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By successfully completing this program, you can obtain your certificate and without the need for travel or dealing with cumbersome paperwork”

This program will allow you to obtain your **Postgraduate certificate in Parallelism in Paralel and Distributed 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.

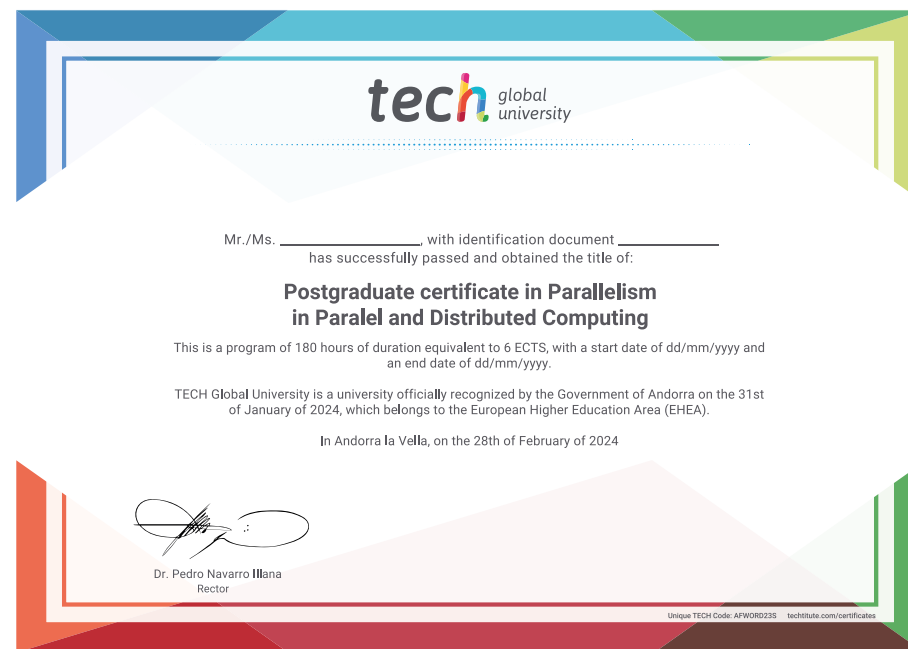
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate certificate in Parallelism in Paralel and Distributed 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 innovation
knowledge present
development languages
virtual classroom



Postgraduate Certificate

Parallelism in Paralel and Distributed Computing

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

Postgraduate Certificate

Parallelism in Parallel and Distributed Computing