Postgraduate Diploma
High Volume and Heterogeneous Category Information Processing Architectures

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Postgraduate Diploma

High Volume and Heterogeneous Category Information Processing Architectures

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/postgraduate-diploma/postgraduate-diploma-high-volume-heterogeneous-category-information-processing-architectures

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01

Introduction

This intensive specialization is aimed at those interested in achieving a higher level of knowledge in High Volume and Heterogeneous Category Information Processing Architectures. Its teaching program is unique for its careful selection of technologies, including the most recently incorporated and in demand in the business world. The main objective of this program is to enable students to apply the knowledge acquired the data management to the real world, in a work environment that reproduces the conditions that may be encountered in the future, in a rigorous and realistic manner.

In this Postgraduate Diploma, you will be university able to balance the efficiency of the most advanced learning methods with the flexibility of a program created to adapt to your possibilities of dedication, without losing quality"

Data is the fundamental raw material for research and knowledge advancement. In recent years, there has been an increase in initiatives that have made the creation, access, use and preservation of data as another axis within the work of communities linked to research in various areas of knowledge. This program offers specialized knowledge in data management, focusing on its typology and life cycle and practical approach through the available resources.

Today there are a large number of applications that we use from our mobile or any other smart device that access services hosted on platforms that are being used by hundreds of thousands of users simultaneously. There are a multitude of applications supported from platforms that must not only serve "human" users but also millions of connected devices such as, IoT modules, smart speakers, etc.

The role of system administrators has now changed from being an operator who modifies system configuration to implement a series of policies to being more of a software architect who designs and implements specific algorithms which will alter the configuration of a series of resources to meet specific requirements demanded at a given time by a specific situation.

On the other hand, during the last decade, in software engineering, especially in the backend, the set of concepts, tools and technologies around distributed systems and data management and processing has grown considerably. In today's rapidly changing landscape, it is critical that students understand the underlying technology of many of today's systems that are highly demanding in terms of scalability, performance and reliability. The ultimate goal of this understanding is to be in the best position to make good decisions in distributed system design, among other issues of interest.

As it is a 100% online program, students will not have to give up personal or professional obligations. Upon completion of the program, students will have updated their knowledge and will be in possession of an incredibly prestigious qualification that will allow them to advance both personally and professionally.

This **Postgraduate Diploma in High Volume and Heterogeneous Category Information Processing Architectures** contains the most complete and up-to-date educational program on the market. The most important features include:

- The development of case studies presented by experts in High Volume and Heterogeneous Category Information Processing Architectures
- 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

Learn to analyze classical system models and identify shortcomings for use in distributed applications"

With the best developed distance learning systems, this Postgraduate Diploma will allow you to learn, in a contextual way, the practical skills that you need"

An intensive professional growth program that will allow you to intervene in a sector with a growing demand for professionals.

A comprehensive program for IT professionals, which will allow them to compete among the best in the sector.

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 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 objective of this program is to prepare professionals in High Volume and Heterogeneous Category Information Processing Architectures, with the necessary knowledge and skills to carry out their activity, using the most advanced protocols and techniques of today. Through a totally adaptable work approach, this Postgraduate Diploma will progressively lead students to acquire the skills that will propel them to a higher professional level. A unique program designed by professionals with extensive experience in the field.

Comprehensive yet focused; this program will provide you with the specific knowledge IT professionals need to compete among the best in the sector"

General Objectives

- Develop each stage of the data lifecycle
- Determine the conditions to be met to optimize data use and quality
- Develop specialised knowledge on maintainable, scalable and reliable systems
- Analyze different data models and their impact on applications
- Examine state-of-the data storage and retrieval engines
- Assess distributed data, partitioning, consistency or replication systems
- Analyze classical system models and identify shortcomings for use in distributed applications
- Examine the distributed computing paradigm and establish the microservice model
- Identify distributed computing requirements and present IaaS, PaaS and SaaS models
- Evaluate the most commonly used tools in large-scale production systems

Specific Objectives

Module 1. Data Types and Data Life Cycle

- Generate specialized knowledge to perform data analysis
- Unify diverse data, Achieving consistency of information
- Produce relevant, effective information, for decision making
- Establish best practices for data management according to their typology and uses
- Use data management tools (with R)

Module 2. Scalable and Reliable Mass Data Usage Systems

- Establish the concepts of reliability, scalability and maintainability
- Evaluate relational, document and network models
- Analyze structured storage in the form of log, B-trees and other structures used in data engines
- Examine consistency models and their relationship to the concept of replication
- Understand the different replication models and associated issues
- Develop the fundamental principles of distributed transactions
- Examine database partitioning and keys to ensure that they are balanced

Module 3. System Administration for Distributed Deployments

- Develop requirements for distributed applications
- Make use of the most advanced tools for the exploitation of distributed applications
- Analyze the use of tools for infrastructure management
- Examine the most useful tools for the implementation of IaaS and PaaS models
- Develop the PaaS model and some of the tools currently used in its implementation
- Assessing monitoring tools oriented to distributed systems
- Propose verification and testing techniques for distributed platforms
- Analyze the most used options in the implementation of Cloud platforms

A complete and cutting-edge program that will allow you to acquire the knowledge you need to work in this sector in a progressive and comprehensive way"

03

Course Management

In its accordance of offering an elite education for all, TECH counts on renowned professionals so that students acquire a solid knowledge in High Volume and Heterogeneous Category Information Processing Architectures. This Postgraduate Diploma has a highly qualified team with extensive experience in the sector, which will offer the best tools for students to develop their skills during the course. In this way, students have the guarantees they need to specialize at an international level in a booming sector that will catapult them to professional success.

A high-quality Postgraduate Diploma that will allow students to advance quickly and steadily in knowledge acquisition, with the scientific rigor of a global quality teaching"

Management

Mr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO en Corporate Technologies in Corporate Technologies
- CTO in AI Shephers GmbH
- Director of Design and Development at DocPath Document Solutions
- Team Leader in DocPath Document Solutions
- Doctorate in Psychology from the University of Castilla La Mancha
- PhD in Economics, Business and Finance from the Camilo José Cela University
- Master's Degree in Advanced Information Technologies from the University of Castilla la Mancha
- Master MBA+E (Master's Degree in Business Administration and Organisational Engineering) from the University of Castilla la Mancha
- Associate lecturer, teaching undergraduate and master's degrees in Computer Engineering at the University of Castilla la Mancha
- Professor of the Master in Big Data and Data Science at the International University of Valencia
- Professor of the Master's in Industry 4.0 and of the Master's in Industrial Design and Development Member of the SMILe Research Group of the University of Castilla la Mancha

Professors

Ms. Fernández Meléndez, Galina

- Data Analyst. Aresi | Gestión de Fincas- Madrid-Spain
- Data Analyst. ADN Mobile Solution-Gijón-Spain
- ETL processes, data mining, data analysis and visualisation, establishment of KPI's, Dashboard design and implementation, management control, ADN Mobile Solution-Gijón-Spain R development, SQL management, among others. Pattern determination, predictive modelling, machine learning
- Bachelor's degree in Business Administration. Bicentennial University of Aragua-Caracas- Diploma in Planning and Public Finance. Venezuelan School of Planning, School of Finance
- Professional Master's Degree in Data Analysis and Business Intelligence. University of Oviedo
- MBA in Business Administration and Management (Escuela De Negocios Europea De Barcelona)
- Master in Big Data and Business Intelligence (Escuela de Negocios Europea de Barcelona)

Mr. Peris Morillo, Luis Javier

- Technical Lead in Capitole Consulting. He leads a team at Inditex in the logistics unit of its open platform
- Senior Technical Lead and Delivery Lead Support at HCL
- Agile Coach and Director of Operations at Mirai Advisory
- Member of the Steering Committee as Chief Operating Officer
- Developer, Team Lead, Scrum Master, Agile Coach, Product Manager in DocPath
- Higher Engineering in Computer Science by the ESI of Ciudad Real (UCLM)
- Postgraduate Degree in Project Management by CEOE - Confederación Española de Organizaciones Empresariales (Spanish Confederation of Business Organisations)
- 50+ MOOCs taken, taught by renowned universities such as Stanford University, Michigan University, Yonsei University, Polytechnic University of Madrid, etc
- Several certifications, some of the most notable or recent ones are Azure Fundamentals

Mr. Díaz Díaz-Chirón, Tobías

- Researcher at the ArCO laboratory of the University of Castilla-La Mancha, a group dedicated to projects related to computer architectures and networks
- Consultant at Blue Telecom, a company dedicated to the telecommunications sector
- Freelance mainly dedicated to the telecommunications sector, specialising in 4G/5G networks
- OpenStack: deploy and administration
- Degree in Computer Engineering from the University of Castilla-La Mancha, specialising in computer architecture and networks
- Associate Professor at the University of Castilla La Mancha in the subjects of distributed systems, computer networks and concurrent programming
- Speaker at Sepecam course on network administration

04

Structure and Content

The syllabus has been designed based on educational efficiency, carefully selecting the contents to offer a comprehensive course, which includes all the fields of study that are essential to achieve real knowledge of the subject. Including the latest updates and aspects of the field. Therefore, a curriculum has been established whose modules offer a broad perspective of High Volume and Heterogeneous Category Information Processing Architectures. From first module, students will see their knowledge expanding, which will enable them to develop professionally, knowing that they can count on the support of a team of experts.

Succeed with the best and acquire the knowledge and skills you need to embark on the High Volume and Heterogeneous Category Information Processing Architectures"

Module 1. Data Types and Data Life Cycle

1.1. Statistics
- 1.1.1. Statistics: Descriptive Statistics, Statistical Inferences
- 1.1.2. Population, Sample, Individual
- 1.1.3. Variables: Definition, Measurement Scales

1.2. Types of Data Statistics
- 1.2.1. According to Type
  - 1.2.1.1. Quantitative: Continuous Data and Discrete Data
  - 1.2.1.2. Qualitative: Binomial Data, Nominal Data and Ordinal Data
- 1.2.2. According to their Shape
  - 1.2.2.1. Numeric
  - 1.2.2.2. Text
  - 1.2.2.3. Logical
- 1.2.3. According to its Source
  - 1.2.3.1. Primary
  - 1.2.3.2. Secondary

1.3. Life Cycle of Data
- 1.3.1. Stages of the Cycle
- 1.3.2. Milestones of the Cycle
- 1.3.3. FAIR Principles

1.4. Initial Stages of the Cycle
- 1.4.1. Definition of Goals
- 1.4.2. Determination of Resource Requirements
- 1.4.3. Gantt Chart
- 1.4.4. Data Structure

1.5. Data Collection
- 1.5.1. Methodology of Data Collection
- 1.5.2. Data Collection Tools
- 1.5.3. Data Collection Channels

1.6. Data Cleaning
- 1.6.1. Phases of Data Cleansing
- 1.6.2. Data Quality
- 1.6.3. Data Manipulation (with R)

1.7. Data Analysis, Interpretation and Evaluation of Results
- 1.7.1. Statistical Measures
- 1.7.2. Relationship Indices
- 1.7.3. Data Mining

1.8. Data Warehouse
- 1.8.1. Elements of a Data Warehouse
- 1.8.2. Design
- 1.8.3. Aspects to Consider

1.9. Data Availability
- 1.9.1. Access
- 1.9.2. Uses
- 1.9.3. Security

Module 2. Scalable and Reliable Mass Data Usage Systems

2.1. Scalability, Reliability and Maintainability
- 2.1.1. Scales
- 2.1.2. Reliability
- 2.1.3. Maintainability

2.2. Data Models
- 2.2.1. Evolution of Data Models
- 2.2.2. Comparison of Relational Model with Document-Based NoSQL Model
- 2.2.3. Network Model

2.3. Data Storage and Retrieval Engines
- 2.3.1. Structured Log Storage
- 2.3.2. Storage in Segment Tables
- 2.3.3. Trees B

2.4. Services, Message Passing and Data Encoding Formats
- 2.4.1. Data Flow in REST Services
- 2.4.2. Data Flow in Message Passing
- 2.4.3. Message Sending Formats

2.5. Replication
- 2.5.1. CAP Theorem
- 2.5.2. Consistency Models
- 2.5.3. Models of Replication Based on Leader and Follower Concepts

2.6. Distributed Transactions
- 2.6.1. Atomic Operations
- 2.6.2. Distributed Transactions from Different Approaches Calvin, Spanner
- 2.6.3. Serialisability

2.7. Partitions
- 2.7.1. Types of Partitions
- 2.7.2. Indexes in Partitions
- 2.7.3. Partition Rebalancing

2.8. Batch Processing
- 2.8.1. Batch Processing
- 2.8.2. MapReduce
- 2.8.3. Post-MapReduce Approaches

2.9. Data Stream Processing
- 2.9.1. Messaging Systems
- 2.9.2. Persistence of Data Flows
- 2.9.3. Uses and Operations with Data Flows

2.10. Use Cases. Twitter, Facebook, Uber
- 2.10.1. Twitter: The Use of Caches
- 2.10.2. Facebook: Non-Relational Models
- 2.10.3. Uber: Different Models for Different Purposes

Module 3. System Administration for Distributed Deployments

3.1. Classic Administration: The Monolithic Model
- 3.1.1. Classical Applications: The Monolithic Model
- 3.1.2. System Requirements for Monolithic Applications
- 3.1.3. The Administration of Monolithic Systems
- 3.1.4. Automation

3.2. Distributed Applications: The Microservice
- 3.2.1. Distributed Computing Paradigm
- 3.2.2. Microservice-Based Models
- 3.2.3. System Requirements for Distributed Models
- 3.2.4. Monolithic Applications vs. Distributed Applications

3.3. Tools for Resource Exploitation
- 3.3.1. "Iron" Management
- 3.3.2. Virtualization
- 3.3.3. Emulation
- 3.3.4. Paravirtualization

3.4. IaaS, PaaS and SaaS Models
- 3.4.1. LaaS Model
- 3.4.2. PaaS Model
- 3.4.3. SaaS Model
- 3.4.4. Design Patterns

3.5. Containerisation
- 3.5.1. Virtualization with Cgroups
- 3.5.2. Containers
- 3.5.3. From Application to Container
- 3.5.4. Container Orchestration

3.6. Clustering
- 3.6.1. High Performance and High Availability
- 3.6.2. High Availability Models
- 3.6.3. Cluster as SaaS Platform
- 3.6.4. Cluster Securitization

3.7. Cloud Computing
- 3.7.1. Clusters vs Clouds
- 3.7.2. Types of Clouds
- 3.7.3. Cloud Service Models
- 3.7.4. Oversubscription

3.8. Monitoring and Testing
- 3.8.1. Types of Monitoring
- 3.8.2. Visualization
- 3.8.3. Infrastructure Tests
- 3.8.4. Chaos Engineering

3.9. Case Study: Kubernetes
- 3.9.1. Structure
- 3.9.2. Administration
- 3.9.3. Deployment of Services
- 3.9.4. Development of Services for K8S

3.10. Case Study: OpenStack
- 3.10.1. Structure
- 3.10.2. Administration
- 3.10.3. Deployment
- 3.10.4. Development of Services for OpenStack

All the subjects and areas of knowledge have been compiled in a complete and up-to-date syllabus, in order to bring students to the highest theoretical and practical level"

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 goalt 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

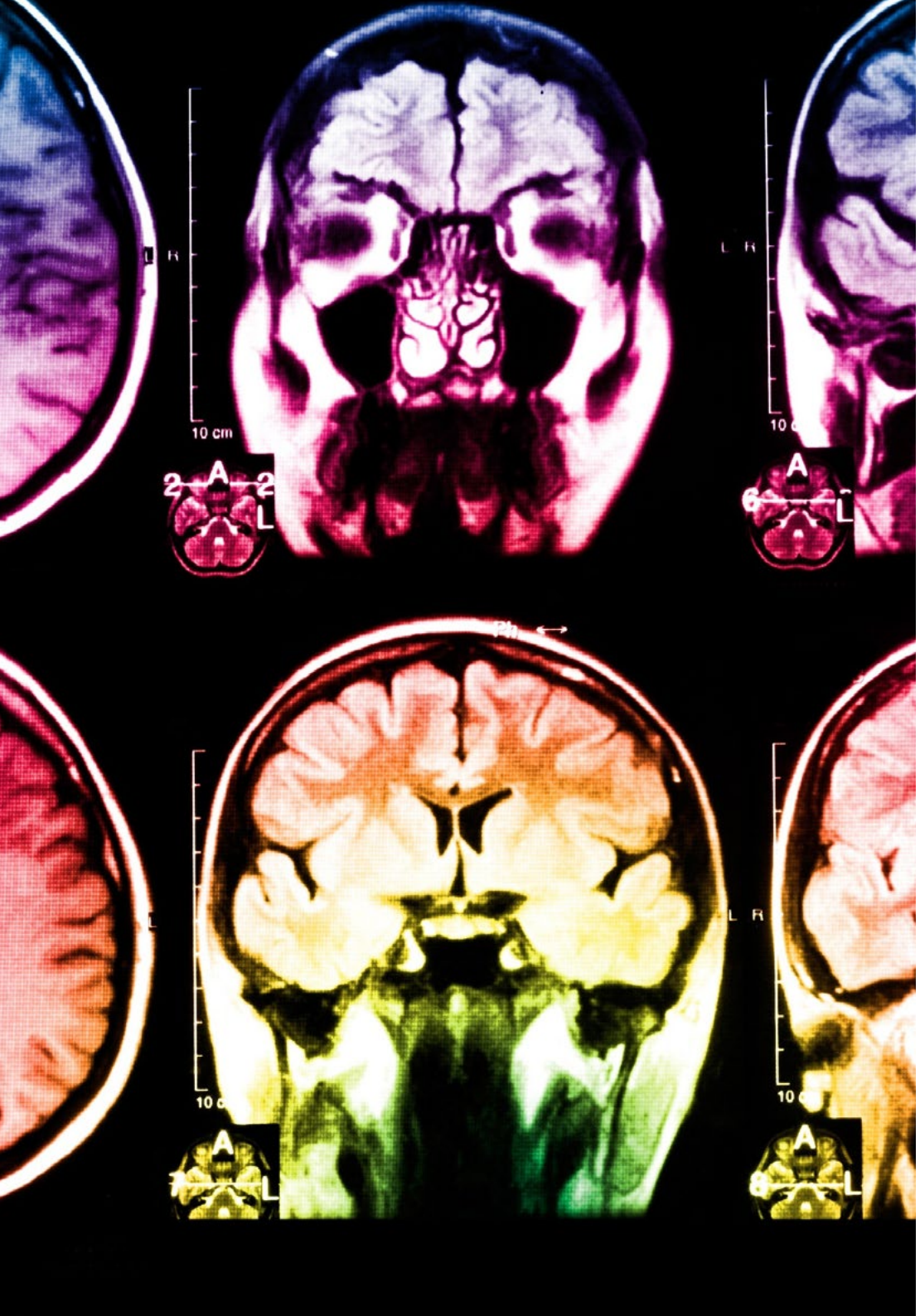
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

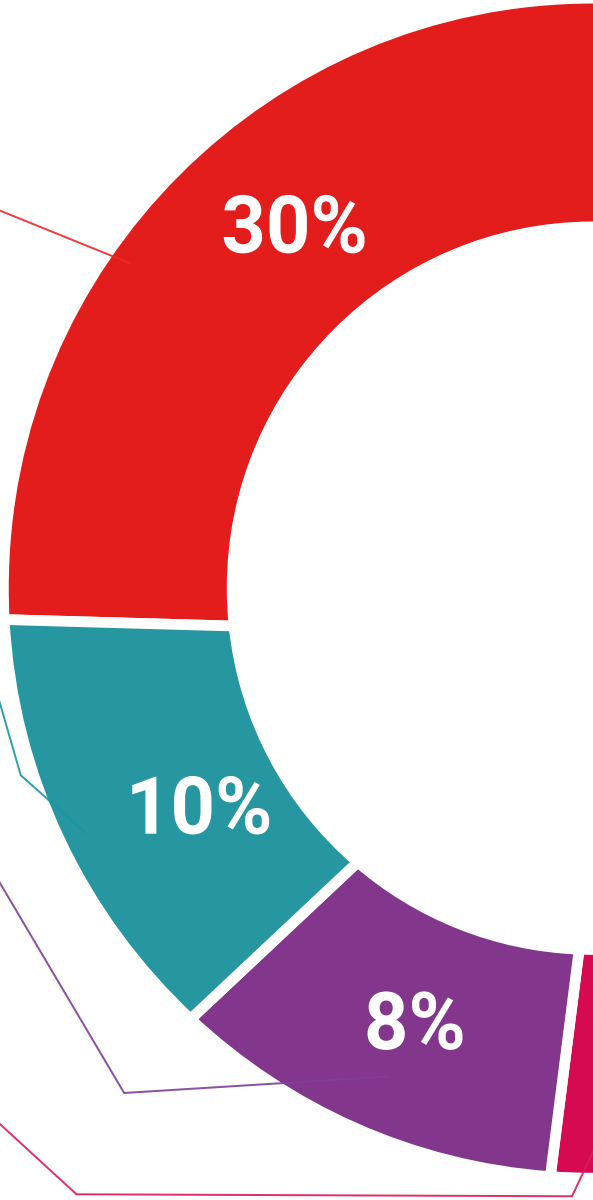
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

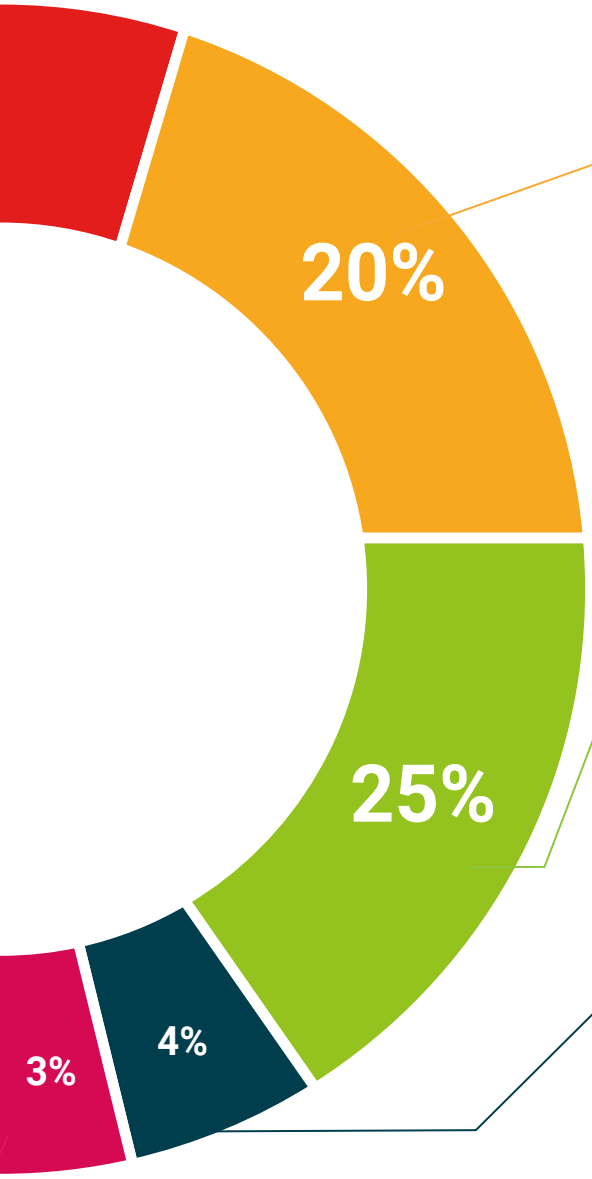
Practising Skills and Abilities

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

This Postgraduate Diploma in Architectures for High Volume and Heterogeneous Category Information Processing Architectures, guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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 Diploma in High Volume and Heterogeneous Category Information Processing Architectures** contains the most complete and up-to-date educational program the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma**, issued by **TECH Technological University** via tracked delivery*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Diploma, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in High Volume and Heterogeneous Category Information Processing Architectures**

Official Nº of Hours: **450 h.**


tech technological university

Awards the following

DIPLOMA

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE DIPLOMA

in

High Volume and Heterogeneous Category Information Processing Architectures

This is a qualification awarded by this University, equivalent to 450 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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