

# Postgraduate Certificate

## Data Intensive Architectures and Systems in Data Science



## Postgraduate Certificate Data Intensive Architectures and Systems in Data Science

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

Website: [www.techtute.com/us/school-of-business/postgraduate-certificate/data-intensive-architectures-systems-data-science](http://www.techtute.com/us/school-of-business/postgraduate-certificate/data-intensive-architectures-systems-data-science)

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# 01 Welcome

Years ago, the rational model became very popular because it offered a quick solution for presenting information from data systems. However, with the development of new technologies, more advanced systems have emerged that allow processing a greater amount of data. In this program, students will learn about both models to establish criteria that will help them choose the one that best suits the needs of the company.



Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science  
TECH Global University



“

*If you want to make an impact on your business, it's time to become an expert in data usage systems”*

02

# Why Study at TECH?

TECH is the world's largest 100% online business school. It is an elite business school, with a model based on the highest academic standards. A world-class centre for intensive managerial skills training.



“

*TECH is a university at the forefront of technology, and puts all its resources at the student's disposal to help them achieve entrepreneurial success"*

## At TECH Global University



### Innovation

The university offers an online learning model that combines the latest educational technology with the most rigorous teaching methods. A unique method with the highest international recognition that will provide students with the keys to develop in a rapidly-evolving world, where innovation must be every entrepreneur's focus.

"Microsoft Europe Success Story", for integrating the innovative, interactive multi-video system.



### The Highest Standards

Admissions criteria at TECH are not economic. Students don't need to make a large investment to study at this university. However, in order to obtain a qualification from TECH, the student's intelligence and ability will be tested to their limits. The institution's academic standards are exceptionally high...

**95%** | of TECH students successfully complete their studies



### Networking

Professionals from countries all over the world attend TECH, allowing students to establish a large network of contacts that may prove useful to them in the future.

**100,000+**

executives trained each year

**200+**

different nationalities



### Empowerment

Students will grow hand in hand with the best companies and highly regarded and influential professionals. TECH has developed strategic partnerships and a valuable network of contacts with major economic players in 7 continents.

**500+**

collaborative agreements with leading companies



### Talent

This program is a unique initiative to allow students to showcase their talent in the business world. An opportunity that will allow them to voice their concerns and share their business vision.

After completing this program, TECH helps students show the world their talent.



### Multicultural Context

While studying at TECH, students will enjoy a unique experience. Study in a multicultural context. In a program with a global vision, through which students can learn about the operating methods in different parts of the world, and gather the latest information that best adapts to their business idea.

TECH students represent more than 200 different nationalities.





TECH strives for excellence and, to this end, boasts a series of characteristics that make this university unique:



### Analysis

---

TECH explores the student's critical side, their ability to question things, their problem-solving skills, as well as their interpersonal skills.



### Academic Excellence

---

TECH offers students the best online learning methodology. The university combines the Relearning method (a postgraduate learning methodology with the highest international rating) with the Case Study. A complex balance between tradition and state-of-the-art, within the context of the most demanding academic itinerary.



### Economy of Scale

---

TECH is the world's largest online university. It currently boasts a portfolio of more than 10,000 university postgraduate programs. And in today's new economy, **volume + technology = a groundbreaking price**. This way, TECH ensures that studying is not as expensive for students as it would be at another university.



### Learn with the best

---

In the classroom, TECH's teaching staff discuss how they have achieved success in their companies, working in a real, lively, and dynamic context. Teachers who are fully committed to offering a quality specialization that will allow students to advance in their career and stand out in the business world.

Teachers representing 20 different nationalities.



*At TECH, you will have access to the most rigorous and up-to-date case studies in the academic community"*

03

# Why Our Program?

Studying this TECH program means increasing the chances of achieving professional success in senior business management.

It is a challenge that demands effort and dedication, but it opens the door to a promising future. Students will learn from the best teaching staff and with the most flexible and innovative educational methodology.



“

*We have highly qualified teachers and the most complete syllabus on the market, which allows us to offer you training of the highest academic level"*

This program will provide students with a multitude of professional and personal advantages, particularly the following:

**01**

### A significant career boost

By studying at TECH, students will be able to take control of their future and develop their full potential. By completing this program, students will acquire the skills required to make a positive change in their career in a short period of time.

*70% of participants achieve positive career development in less than 2 years.*

**02**

### Develop a strategic and global vision of companies

TECH offers an in-depth overview of general management to understand how each decision affects each of the company's different functional areas.

*Our global vision of companies will improve your strategic vision.*

**03**

### Consolidate the student's senior management skills

Studying at TECH means opening the doors to a wide range of professional opportunities for students to position themselves as senior executives, with a broad vision of the international environment.

*You will work on more than 100 real senior management cases.*

**04**

### Take on new responsibilities

The program will cover the latest trends, advances and strategies, so that students can carry out their professional work in a changing environment.

*45% of graduates are promoted internally.*

05

### Access to a powerful network of contacts

TECH connects its students to maximize opportunities. Students with the same concerns and desire to grow. Therefore, partnerships, customers or suppliers can be shared.

*You will find a network of contacts that will be instrumental for professional development.*

06

### Thoroughly develop business projects

Students will acquire a deep strategic vision that will help them develop their own project, taking into account the different areas in companies.

*20% of our students develop their own business idea.*

07

### Improve soft skills and management skills

TECH helps students apply and develop the knowledge they have acquired, while improving their interpersonal skills in order to become leaders who make a difference.

*Improve your communication and leadership skills and enhance your career.*

08

### Be part of an exclusive community

Students will be part of a community of elite executives, large companies, renowned institutions, and qualified professors from the most prestigious universities in the world: the TECH Global University community.

*We give you the opportunity to train with a team of world renowned teachers.*

04

# Objectives

Under the premise of building a better professional profile for students, TECH has developed the most complete and updated program in the market. It also has a series of objectives that will set the guidelines for computer engineers at all times.



“

*Develop your capabilities to lead and execute the implementation of data systems”*

TECH makes the goals of their students their own goals too.  
Working together to achieve them.

The Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science qualifies students to:

01

Determine the requirements for mass data usage systems

02

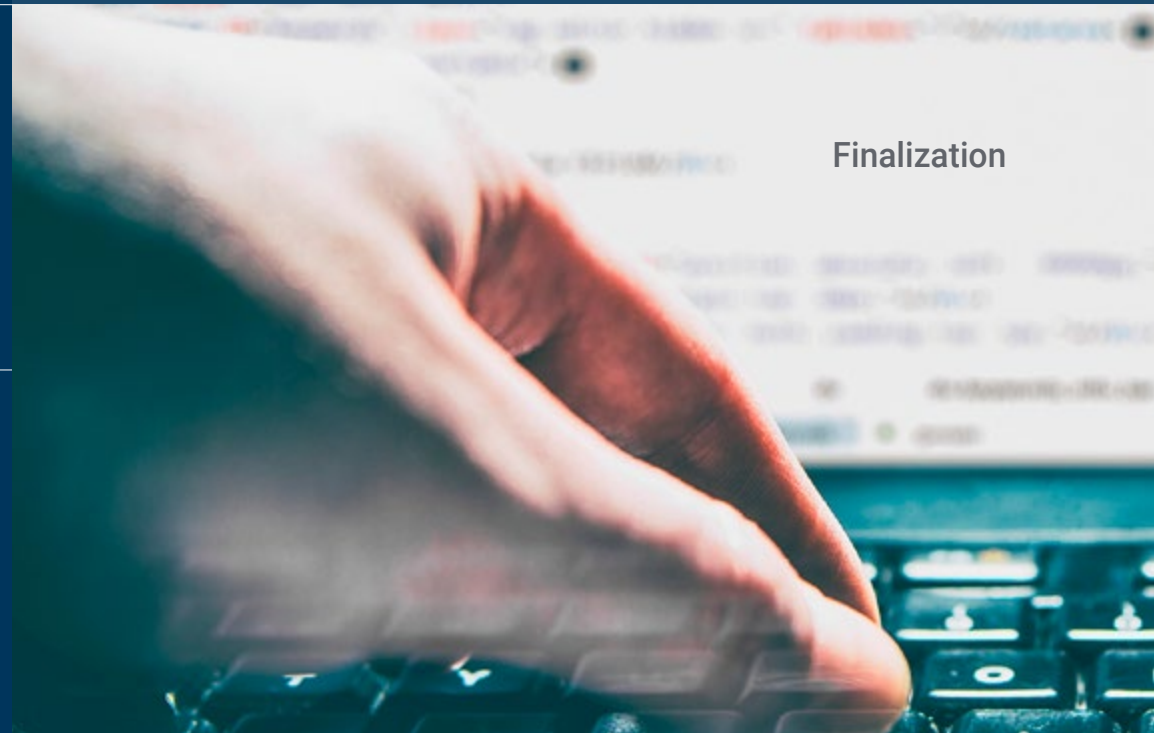
Examine different data models and analyze databases

03

Analyze the key functionalities for distributed systems and their importance in different types of systems

04

Assess which widely used applications use the fundamentals of distributed systems to design their systems



Finalization



05

Analyze the way in which databases store and retrieve information

06

Understand the different replication models and associated issues

07

Develop ways of partitioning and distributed transactions

08

Assess batch systems and (near) real time systems



05

# Structure and Content

This Postgraduate Certificate has an online modality that will help to develop the competencies and skills necessary to analyze the functionalities of data interpretation systems. The students will be able to apply what they have learned almost immediately in their field of work, increasing, in turn, their opportunity to opt for an executive role.



“

*It is time to learn from a new perspective. The online modality will be your ally to grow professionally”*

## Syllabus

The Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science of TECH Global University, will become a complete experience that will help students to generate specialized knowledge about the tools and strategies used in this field.

This will be approached from the perspective of a technology department director. Therefore, the students will develop critical thinking skills that will favor their entrepreneurial advancement.

For this reason, in each class, you will have the opportunity to assess which applications are widely used in the fundamentals of distributed systems in order to design new, ingenious and, above all, your own programs.

In this way, you will have acquired a criterion to discriminate between programs and functionalities, which in the long term will be an advantage when opting for a higher-level profile in the company.

By means of practical cases, students will have a much better understanding of the knowledge imparted. In turn, they will be encouraged to achieve excellence in the field of leadership and management of a technology department in a company. They will understand the needs of the business and be able to propose new and innovative strategies.

This Postgraduate Certificate is developed over 6 week and is divided into 1 module:

### Module 1

### Data Intensive Systems and Architectures



### Where, When and How is it Taught?

TECH offers the possibility of developing this Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science completely online. Over the course of 6 weeks, you will be able to access all the contents of this program at any time, allowing you to self-manage your study time.

*A unique, key, and decisive educational experience to boost your professional development and make the definitive leap.*

**Module 1. Data Intensive Systems and Architectures**

**1.1. Non-Functional Requirements: Pillars of Big Data Applications**

- 1.1.1. Reliability
- 1.1.2. Adaptation
- 1.1.3. Maintainability

**1.2. Data Models**

- 1.2.1. Relational Model
- 1.2.2. Document Model
- 1.2.3. Graph Type Data Model

**1.3. Databases. Storage Management and Data Recovery**

- 1.3.1. Hash Indexes
- 1.3.2. Log Structured Storage
- 1.3.3. Trees B

**1.4. Data Coding Formats**

- 1.4.1. Language-Specific Formats
- 1.4.2. Standardized Formats
- 1.4.3. Binary Coding Formats
- 1.4.4. Data Stream Between Processes

**1.5. Replication**

- 1.5.1. Objectives of Replication
- 1.5.2. Replication Models
- 1.5.3. Problems with Replication

**1.6. Distributed Transactions**

- 1.6.1. Transaction
- 1.6.2. Protocols for Distributed Transactions
- 1.6.3. Serializable Transactions

**1.7. Partitions**

- 1.7.1. Forms of Partitioning
- 1.7.2. Secondary Index Interaction and Partitioning
- 1.7.3. Partition Rebalancing

**1.8. Offline Data Processing**

- 1.8.1. Batch Processing
- 1.8.2. Distributed File Systems
- 1.8.3. MapReduce

**1.9. Data Processing in Real Time**

- 1.9.1. Types of Message Broker
- 1.9.2. Representation of Databases as Data Streams
- 1.9.3. Data Stream Processing

**1.10. Practical Applications in Business**

- 1.10.1. Consistency in Readings
- 1.10.2. Holistic Focus of Data
- 1.10.3. Scaling of a Distributed Service

“

*Learning and growing professionally has never been easier. This program is your best opportunity to aspire to that director position in your company”*

# 06

# 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"*

## TECH Business School uses the 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”*



*This program prepares you to face business challenges in uncertain environments and achieve business success.*



## A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch to present executives with challenges and business decisions at the highest level, whether at the national or international level. 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 business reality is taken into account.

“

*You 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 business 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 we face in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They must integrate all their knowledge, research, argue and defend their ideas and decisions.

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

## Relearning Methodology

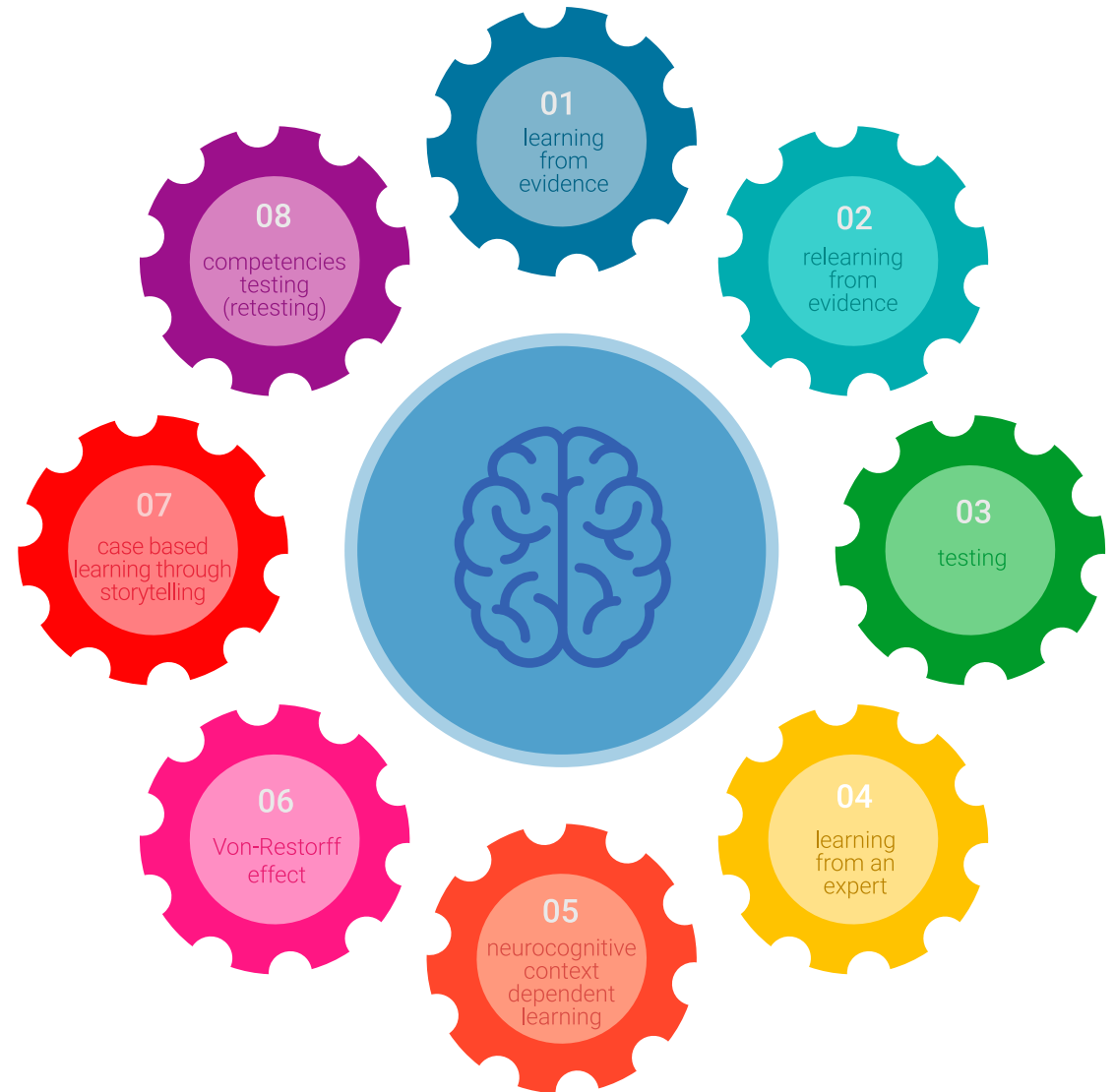
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*Our online system will allow you to organize your time and learning pace, adapting it to your schedule. You will be able to access the contents from any device with an internet connection.*

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 online business school is the only one in the world licensed to incorporate 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.

With this methodology we have 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, markets, and financial 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.

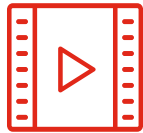
*Relearning will allow you to learn with less effort and better performance, involving you more in your specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to success.*

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.



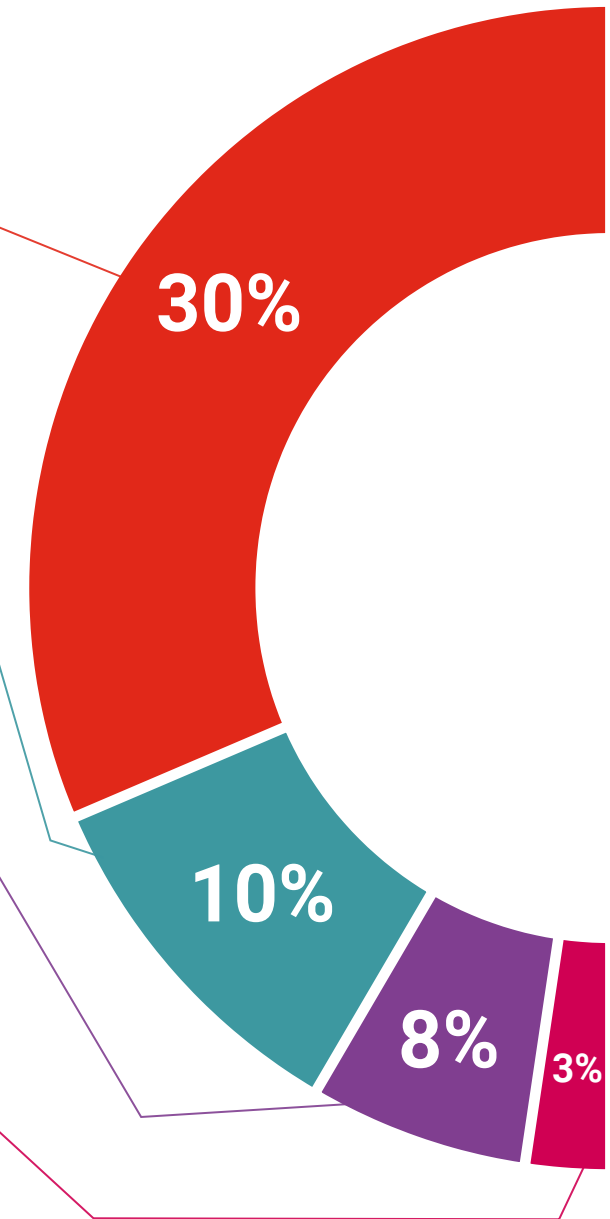
### Management Skills Exercises

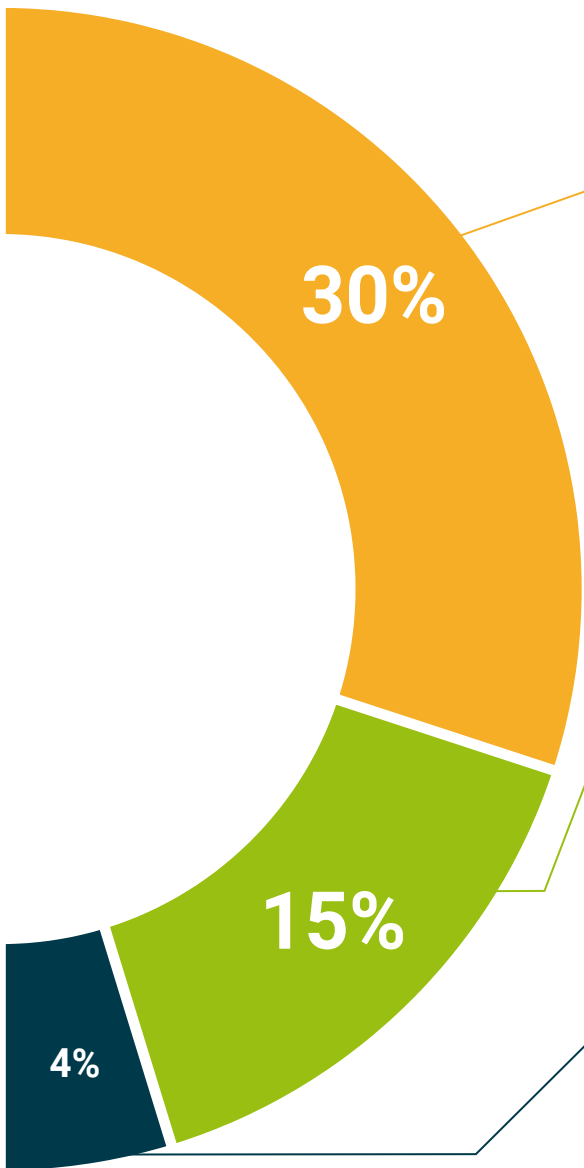
They will carry out activities to develop specific executive competencies in each thematic area. Practices and dynamics to acquire and develop the skills and abilities that a high-level manager needs to develop in the context of the globalization we live in.



### 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

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 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 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.



07

# Our Students' Profiles

The TECH graduates are professionals capable of facing any work challenge. Being analytical, critical and ingenious, they are able to propose innovative solutions in their work team. This makes them capable of leading a work team of excellence. Therefore, this program is designed for computer engineers who are looking to go a step further in their careers.







“

*This Postgraduate Certificate will mean a radical change in the way you see Data Science and business”*

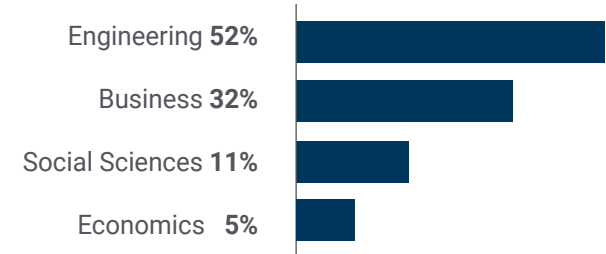
### Average Age

Between **35** and **45** years old

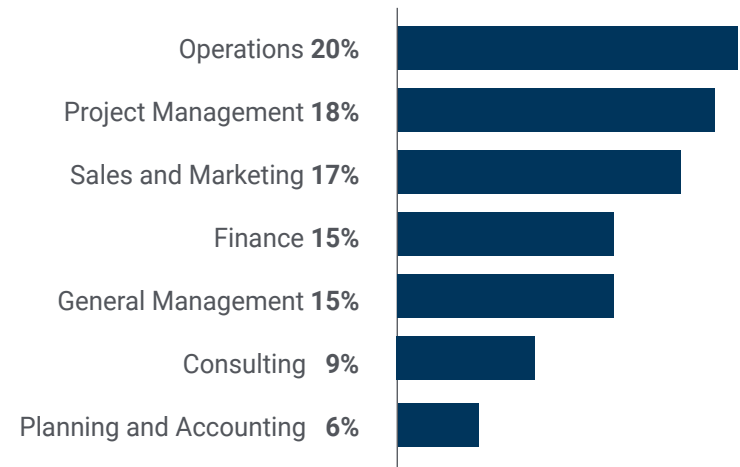
### Years of Experience



### Training

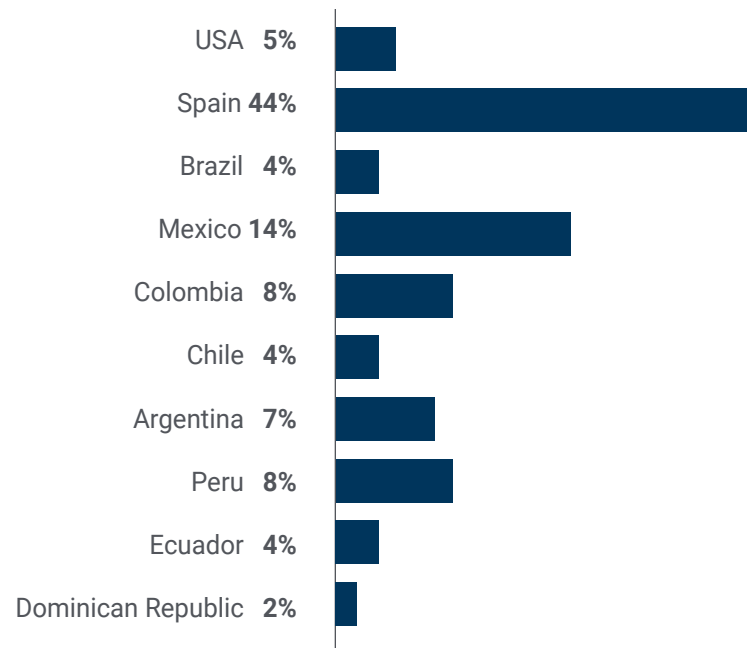


### Academic Profile



## Geographical Distribution

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## Marissa Alcabú

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Data Engineer

*"This Postgraduate Certificate gave me an insight into how message brokers and offline data processing works. In each class I learned something completely new. I would enroll again without hesitation and that is why I recommend it blindfolded. A great success"*

08

# Course Management

This Postgraduate Certificate has a select group of experts with multiple years of experience in data development and analysis. Together, they have created a program that will enhance the students' skills in a practical and educational way.



“

*This program stands out thanks to the support of the faculty who have created a specialized and up-to-date syllabus”*

## International Guest Director

Dr. Tom Flowerdew is an internationally prominent personality in the field of **data science**. He has served as **Vice President of Data Science** at **MasterCard** in **London**. In this role, he has been responsible for the preparation, operation and strategy of a consolidated team in this area, with the mission to support a portfolio of **innovative products in payments**, fight against **money laundering (AML)** and analyze **cryptocurrency** use cases.

He has also been **Director of Data Science** in **Cyber Intelligence Solutions**, also at **MasterCard**, where he has led the integration of data to support revolutionary **cryptocurrency-based** products. In fact, his ability to handle complex **data** and develop **advanced solutions** has been instrumental to the success of multiple projects in the **cybersecurity** and **finance** space.

Similarly, for the company **Featurespace**, he has held several crucial roles, including **Head of Standardized Product Delivery**, in **Cambridge**, leading a team and a transformation project that has reduced delivery time and effort by more than 75%. In addition, as **Head of Delivery**, **U.S. headquarters**, he has managed all of the company's **North American** delivery functions, significantly improving operational efficiency and strengthening **customer** relationships.

Additionally, Doctor Tom Flowerdew has demonstrated his ability to build and lead high-performing teams throughout his career, most notably in his role as **Data Scientist**, both in **Atlanta**, where he has recruited and managed a group of experts in the field, and in **Cambridge**. In this way, his focus on innovation and **problem solving** has left an indelible mark on the organizations where he has worked, establishing himself as an **influential leader** in the field of **data science**.



## Dr. Flowerdew, Tom

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- Vice President of Data Science at MasterCard, London, United Kingdom
- Director of Data Science, Cyber Intelligence Solutions, MasterCard, London
- Head of Standardized Product Delivery at Featurespace, Cambridge
- Delivery Manager for United States, at Featurespace, Cambridge
- Data Scientist at Featurespace, Atlanta, Georgia, United States
- Data Scientist at Featurespace, Cambridge
- Research Fellow in Statistics and Operations Research at the University of Lancaster
- Ph.D. in Operations Research from Lancaster University
- B.S. in Systems Engineering from BAE Systems
- B.Sc. in Mathematics from the University of York

“

*Thanks to TECH you  
will be able to learn with  
the best professionals  
in the world”.*

## Management



### **Dr. Peralta Martín-Palomino, Arturo**

- ♦ CEO and CTO at Prometheus Global Solutions
- ♦ CTO at Corporate Technologies in Corporate Technologies
- ♦ CTO in AI Shephers GmbH
- ♦ Doctorate in Psychology from the University of Castilla La Mancha
- ♦ PhD in Economics, Business and Finance from the Camilo José Cela University. Outstanding Award in her PhD
- ♦ PhD in Psychology, University of CastillaLa Mancha
- ♦ 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
- ♦ Lecturer of the Master's Degree in Industry 4.0 and the Master's Degree in Industrial Design and Product Development
- ♦ Member of the SMILe Research Group of the University of Castilla La Mancha





## Professors

### 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 y 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 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

09

# Impact on Your Career

This program involves a great economic, professional and, of course, personal investment, of which TECH is aware. The ultimate goal of carrying out this great effort should be to achieve professional growth in the students' field of interest.



“

*You will master various techniques and skills that will positively impact your career”*

### Are you ready to take the leap? Excellent professional development awaits you

TECH's Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science is an intensive program that prepares future graduates to face challenges and business decisions in the field of data analysis. The main objective is to promote personal and professional growth. Helping students achieve success.

If you want to improve yourself, make a positive change professionally and network with the best, this is the place for you.

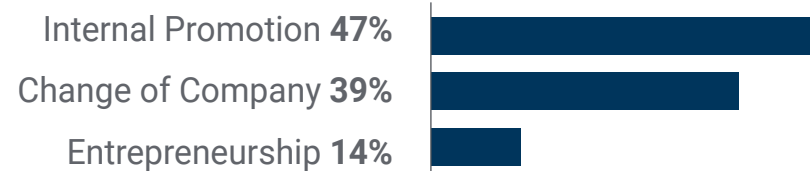
*This program has the key to the students' professional success: updated content and educational methodology.*

*If you want to make a positive change in your profession, the Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science will help you achieve it.*

#### When the change occurs



#### Type of change



## Salary increase

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This program represents a salary increase of more than **25.33%** for our students.



10

# Benefits for Your Company

The Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science contributes to elevating the organization's talent to its maximum potential through the education of high-level leaders.

Participating in this program is a unique opportunity to access a powerful network of contacts in which to find future professional partners, customers or suppliers.





“

*Manage different internships to find  
the job that fits your new skills”*

Developing and retaining talent in companies is the best long-term investment.

**01**

### **Intellectual Capital and Talent Growth**

The professional will introduce the company to new concepts, strategies, and perspectives that can bring about significant changes in the organization.

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**02**

### **Retaining high-potential executives to avoid talent drain**

This program strengthens the link between the company and the professional and opens new avenues for professional growth within the company.

**03**

### **Building agents of change**

The student will be able to make decisions in times of uncertainty and crisis, helping the organization overcome obstacles.

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**04**

### **Increased international expansion possibilities**

Thanks to this program, the company will come into contact with the main markets in the world economy.





05

### **Project Development**

The professional can work on a current project or develop new projects in the field of R&D or Business Development within their company.

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06

### **Increased competitiveness**

This Postgraduate Certificate will equip your professionals with the skills to take on new challenges and therefore drive the organization forward.

11

# Certificate

The Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.





“

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

This program will allow you to obtain your **Postgraduate Certificate in Data Intensive Architectures and Systems in Data Science** 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 Data Intensive Architectures and Systems in Data Science**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



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



## Postgraduate Certificate Data Intensive Architectures and Systems in Data Science

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

# Postgraduate Certificate Data Intensive Architectures and Systems in Data Science

