

# Postgraduate Certificate

Big Data systems and Hadoop ecosystem for its Exploitation





## Postgraduate Certificate Big Data systems and Hadoop ecosystem for its Exploitation

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online
- » Target Group: computer engineers who wish to reorient their work towards the world of analytics and business intelligence, or established professionals in this field who need to update, delve and improve their skills and knowledge

Website: [www.techtute.com/pk/school-of-business/postgraduate-certificate/big-data-systems-hadoop-ecosystem-exploitation](http://www.techtute.com/pk/school-of-business/postgraduate-certificate/big-data-systems-hadoop-ecosystem-exploitation)

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# 01 Welcome

Within the framework of Industry 4.0 or what is known as "smart factories", the trend to automate processes and data exchange is on the rise. This is where *Big Data* or macro data comes in, as a fundamental element in the framework of this fourth industrial revolution. Therefore, people capable of understanding and determining which is the most appropriate system to perform the work and manage the entire ecosystem for its proper use are needed. That is why it is important to specialize and keep up-to-date as a professional or entrepreneur, with this program oriented to understand how the *Big Data* System and Hadoop Ecosystem works for its Exploitation from a 100% *online* study environment and led by experts who will accompany you throughout the journey.



Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation.

TECH Technological University



“

*Specialize in the management of distributed systems with massive use of data and delve into the most used Apache systems in just 6 weeks and 100% online"*

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 center for intensive managerial skills education.



“

*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 Technological University



### Innovation

The university offers an online learning model that balances 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.

**+100000**

executives prepared 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

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TECH offers students the best online learning methodology. The university combines the Relearning method (postgraduate learning methodology with the best international valuation) with the Case Study. Tradition and vanguard in a difficult balance, and in the context of the most demanding educational 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 ground-breaking 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 analyses in academia"*

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 education of the highest academic level”*

This program will provide you with a multitude of professional and personal advantages, among which we highlight the following:

**01**

### A Strong Boost to Your Career

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 students achieve positive career development in less than 2 years.*

**02**

### Develop a strategic and global vision of the company

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

*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**

### You will 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 fields 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

### You will be part of an exclusive community

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

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

# 04 Objectives

This Postgraduate Certificate has been created with the objective of providing specialization to any professional or entrepreneur who requires the use of new systems for the management and control of massive data for the proper functioning of the processes of their work environment. TECH, guaranteeing a high professional level, has synthesized the best contents on Big Data System and Hadoop Ecosystem for its Exploitation, in a syllabus chosen by expert teachers. Who will teach their experiences through a virtual campus for the convenience of the student providing value for the achievement of their goals.



“

*With this Postgraduate Certificate you will learn about the different options, as well as the advantages and disadvantages of big data systems”*

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

The Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation will enable the student to:

01

Analyze systems that work with big data

02

Establish the essential qualities of distributed systems

03

Examine different models, forms of storage and retrieval of data







04

Develop the fundamental concepts in distributed data systems

05

Present the structure of Hadoop, the data flow for Big data analysis and the most commonly used tools

06

Determine big data analysis processes in Hadoop

07

Determine the limitations of the Hadoop model and introduce new tools such as Spark

08

Introduce specific tools used in Spark

09

Evaluating the relational model and NoSQL models





10

Analyze each of the CAP theorem concepts in detail

11

Adequately present the information, using the power of languages to synthesize the conclusions of the analysis in an explanatory way

12

Evaluate, in broad terms, some of the most widely used technological solutions in use today

05

# Structure and Content

The Postgraduate Certificate in Big Data Systems and Hadoop Ecosystem for its Exploitation, perfectly covers all the needs and professional requirements that the sector demands. Always thinking about the development of its students, TECH has created this program with the help of an excellent group of experts who will show, in a practical and dynamic way, the advantages of the most implemented and effective systems for data management and its different tools in only 150 hours of study or 6 weeks.



“

*Delve into the most widely used Apache systems for both batch processing with Apache Hadoop and real-time with Apache Spark"*

## Syllabus

*Big data* is fundamental in the framework of the fourth industrial revolution, in economic growth and development for countries and organizations that achieve an effective use of data, where the main challenge is the development of software and analytical systems that convert the data generated by smart factories into useful and valuable information that generates added value.

This program seeks to make the professional more efficient by being able to improve the administration and management of data that is generated second by second in your company or business, and that give signals of how processes should be oriented or generate new strategies that respond to the requirements of the market and the environment.

Due to its importance, the syllabus has been distributed in 6 weeks or 150 hours for an online teaching, through an innovative relearning methodology based on the reiteration of the key concepts of the syllabus, making available to the student the information in different interactive formats available from any device with internet connection and with the possibility of downloading it for consultation when required.

The Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation, addresses both the fundamental pieces of Big Data systems. As the most used Apache systems, for batch processing with Apache Hadoop, as well as in real time with Apache Spark. From the functional point of view, as well as in the theoretical support through MapReduce, linking with the learning systems through the use of Apache Mahout.

This Postgraduate Certificate takes place over 6 weeks and it consists of 1 module:

### Module 1

### Big Data systems and Hadoop ecosystem for its Exploitation



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

TECH offers the possibility of developing this Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation completely online. During the 6 weeks that the specialization program lasts, the student will be able to access all the contents of this program at any time, which will allow them to manage their own study time.

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

**Module 1. Big Data systems and Hadoop ecosystem for its Exploitation**

**1.1. Massive data systems**

- 1.1.1. Scales
- 1.1.2. Reliability
- 1.1.3. Maintainability

**1.2. Data Representation**

- 1.2.1. Evolution of Data Models
- 1.2.2. Comparison of the relational model with the document model
- 1.2.3. Network Model

**1.3. Data Storage and Retrieval Engines**

- 1.3.1. Storage in file with log structure
- 1.3.2. Storage in tables of sorted strings
- 1.3.3. Trees B

**1.4. Data flow models and coding formats**

- 1.4.1. Data Flow in REST Services
- 1.4.2. Data Flow in Message Passing
- 1.4.3. Different message sending formats

**1.5. Replication**

- 1.5.1. CAP Theorem
- 1.5.2. Consistency Models
- 1.5.3. Different models of leaders and followers

**1.6. Distributed Transactions**

- 1.6.1. Atomic Operations
- 1.6.2. Distributed transactions for partitioned databases
- 1.6.3. Serialisability

**1.7. Partitions**

- 1.7.1. Types of Partitions.
- 1.7.2. Indexes in Partitions.
- 1.7.3. Partition Rebalancing

**1.8. Big-Data Analysis: Hadoop**

- 1.8.1. Architecture and data flow
- 1.8.2. The HDFS System
- 1.8.3. The MapReduce *framework*
- 1.8.4. Data Processing: HDFS, MapReduce and YARN

**1.9. Big-Data analysis tools on *Hadoop***

- 1.9.1. The *Hadoop* ecosystem
- 1.9.2. A language for *Big-Data* analysis: *Pig*
- 1.9.3. Massive data Capture: *Flume*
- 1.9.4. Beyond HDFS and *MapReduce*: *Hive*

**1.10. *Big Data* and *Machine Learning*: *Spark***

- 1.10.1. Limitations to the *Hadoop* model
- 1.10.2. Architecture and data flow
- 1.10.3. Data processing in *Spark*: operations with RDDs
- 1.10.4. Machine learning with *Spark* and Mahout





“

*Perform more comprehensive and accurate analysis for your company with the right Bid data system. Learn which are the most powerful in this Postgraduate Certificate"*

# 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.*



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

### 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.

## 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

This Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation is intended for those professionals specialized in the field of technology, IT or business marketing who wish to boost their career to the next level. It is also for those who wish to take a different path and offer the service in an autonomous way. Whatever the model to take, education is the key to someone who wants to grow and meet short, medium and long term goals.





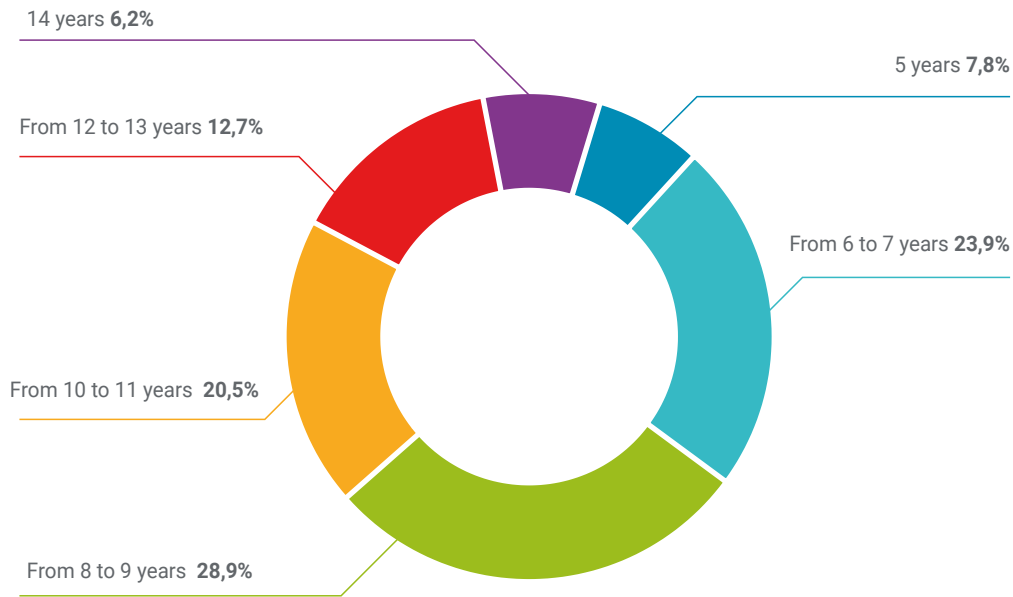
“

*Master new tools and automated systems for batch and real-time data management. Enroll now”*

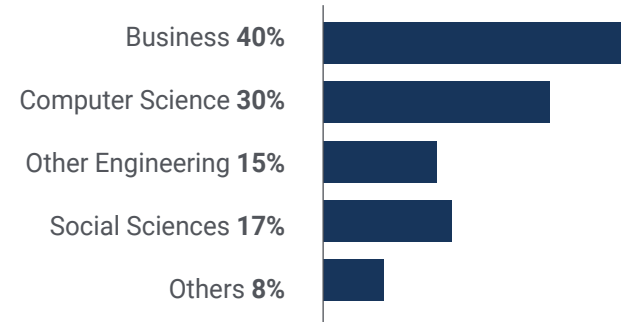
### Average Age

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

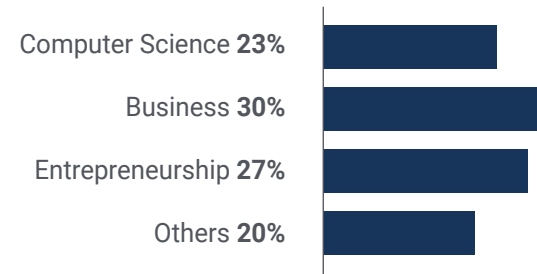
### Years of Experience



### Training

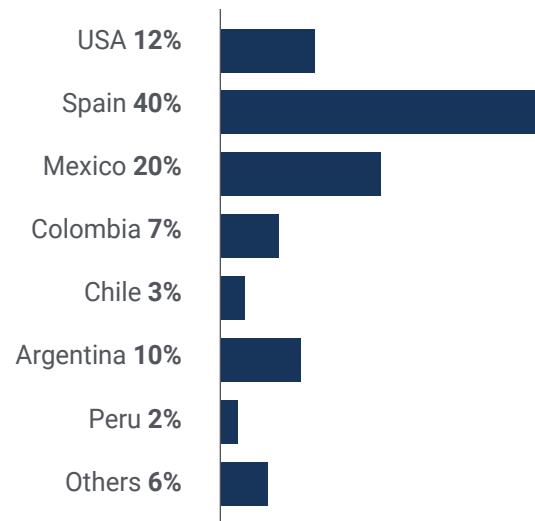


### Educational Profile



## Geographical Distribution

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## Ayose Rodríguez

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*Big Data Analyst*

*"In this program I found the best tools that now offer me better results in my functions within the company. I have achieved to improve processes by 6% in the last month after having applied all the knowledge. The methodology applied by TECH helped me to achieve the goal of professionalization, between work and daily responsibilities"*

08

# Course Management

The teaching team of this Postgraduate Certificate is composed of working professionals who know perfectly the most updated aspects of Big Data System and Hadoop Ecosystem for its Exploitation. They will offer students the opportunity to learn about the structure of Hadoop, the data flow for *Big Data* analysis and the most used tools. Among other fundamental aspects detailed in the agenda of this program, providing the tools that the professional needs to achieve effectiveness in their projects.





“

*Expert teachers will accompany you  
in your learning process and make it  
a productive experience”*

## Management



### Dr. Peralta Martín-Palomino, Arturo

- ♦ CEO and CTO at Prometheus Global Solutions
- ♦ CTO en Corporate Technologies in Corporate Technologies
- ♦ CTO in AI Shephers GmbH
- ♦ Doctorate in Psychology from the University of CastillaLa
- ♦ PhD in Economics, Business and Finance from the Camilo José Cela University. Outstanding Award in her PhD
- ♦ 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





## Professor

### 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
- ◆ Lecturer in Sepecam course on network administration

### Mr. Peris Morillo, Luis Javier

- ◆ Technical Lead in Capítol Consulting. He leads a team at Inditex in the logistics unit of its open platform
- ◆ Senior Technical Lead y Delivery Lead Support en 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 Fundamen

09

# Impact on Your Career

Master new massive data management systems gives the company control over its processes and results at a strategic and planning level. The professional who provides value and this knowledge will be recognized and will embark on a successful career path.



“

*Move to the next level in your career  
with the most innovative TECH  
education led by real experts”*

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

The Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation of TECH, is an intensive program that prepares you to face challenges and business decisions in the field of *business intelligence*. The main objective is to promote your personal and professional growth. Helping you achieve success.

If you want to improve, make a positive change at a professional level and network with the best, then this is the place for you.

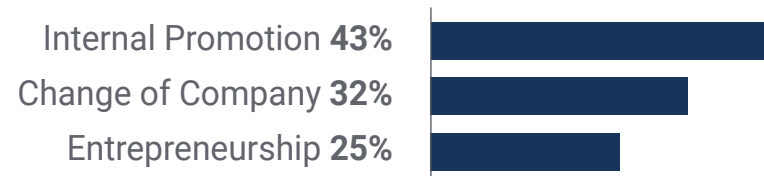
*Enroll now in the Postgraduate Certificate with the most up-to-date content on the market.*

*Experience the potential of Big Data System and Hadoop Ecosystem for its Exploitation training, let your career take off.*

#### time of change



#### Type of change



## Salary increase

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This program represents a salary increase of more than **22%** for our students.



10

# Benefits for Your Company

This Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation, analyzes distributed systems with massive use of data, detailing its characteristics and delving into the foundations. In such a way that, knowing the different options, as well as the advantages and disadvantages of the fundamental pieces of *Big Data* systems, the best options can be chosen in future designs to obtain the desired results.



“

*Education for more specialized professionals  
in more productive companies”*

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

01

### **Growth of talent and intellectual capital**

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

---

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**

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

---

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 real project or develop new projects in the field of R & D or business development of your company.

---

06

### **Increased competitiveness**

This program will equip students with the skills to take on new challenges and drive the organization forward.

11

# Certificate

The Postgraduate Certificate in Big Data systems and Hadoop ecosystem for its Exploitation guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.



“

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

This **Postgraduate Certificate in Big Data systems and Hadoop ecosystem for its Exploitation** contains the most complete and up-to-date program on the market.

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

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

Title: **Postgraduate Certificate in Big Data System and Hadoop Ecosystem for its Exploitation**

Official N° of Hours: **150 h.**



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



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- » Schedule: **at your own pace**
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