



### Postgraduate Diploma Blockchain Development

» Modality: online

» Duration: 6 months

» Certificate: TECH Global University

» Credits: 18 ECTS

» Schedule: at your own pace

» Exams: online

Target Group: University Graduates who have previously completed any of the qualifications in the fields of Social and Legal Sciences, Administrative and Business Sciences.

 $We b site: {\color{blue}www.techtitute.com/us/school-of-business/postgraduate-diploma/postgraduate-diploma-blockchain-development}$ 

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Certificate

# 01 **Welcome**

The emergence of Blockchaintechnology has transformed everything. It is no longer possible to conceive banking processes, transactions of all kinds and other operations outside the economic world without thinking about the solutions offered by Blockchains. Thus, this program offers the professional the opportunity to specialize in Blockchaindevelopment, being able to create important and innovative projects around this technology, and proposing new solutions in the business field. This program, therefore, will bring the professional closer to this important technological field, giving them the option of leading their own company to success by taking advantage of all the possibilities of the Blockchain.world.







### tech 08 | Why Study at TECH?

#### At TECH Global 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

+200

executives prepared each year

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.



#### 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"

### Why Study at TECH? | 09 tech

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* methodology (the most internationally recognized postgraduate learning methodology) with Harvard Business School case studies. A complex balance of traditional and state-of-the-art methods, within the most demanding academic framework.



#### **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.



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.



### tech 12 | Why Our Program?

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



#### 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.



## 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.



### 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.



### 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.



#### 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.



#### 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.



#### 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.



#### 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 Global University community.

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





### tech 16 | Objectives

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

The **Postgraduate Diploma in Blockchain Development** will train the student to:







Determining the sizing criteria for an application with Hyperledger besu



Generate specialized knowledge about Hyperledger y fabric

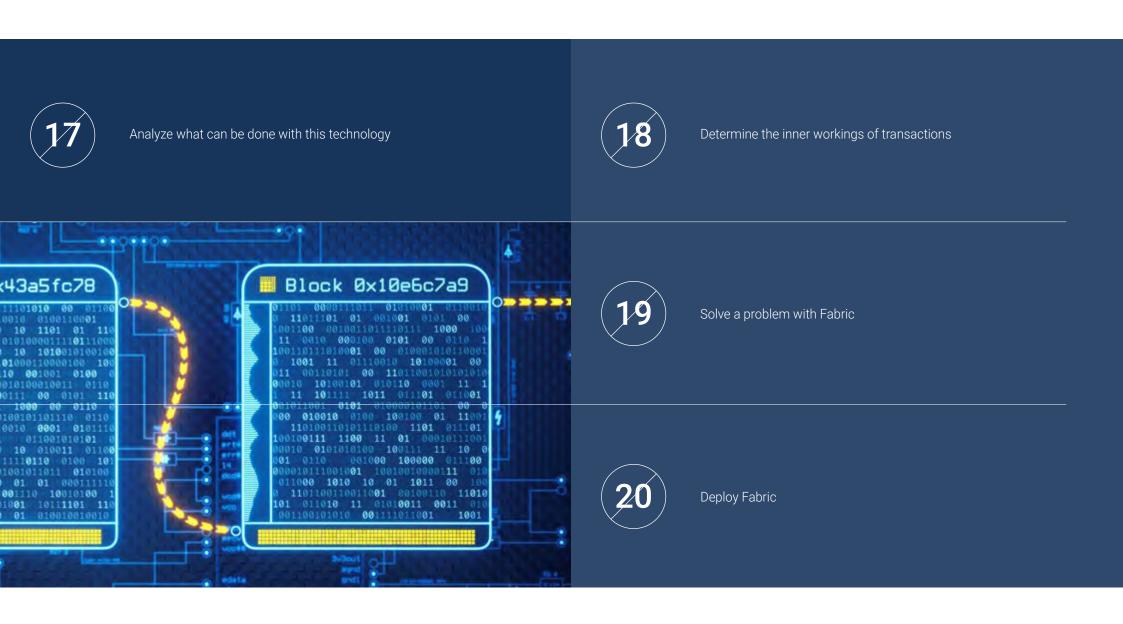


Strengthen knowledge of the functioning of the consensus mechanisms implemented in Hyperledger besu



Define the most interesting technological Stack in the implementation of infrastructure and development of applications based on Hyperledger Besu.









### tech 22 | Structure and Content

#### **Syllabus**

This TECH program prepares the student to respond to all of today's technological and business challenges from the use of Blockchain.technology.

This technology is essential in a large number of processes today, so having the most advanced knowledge in this field will allow professionals to provide solutions for their company and their clients.

Therefore, throughout 3 modules, in a period of 6 months, you will be able to delve into the latest developments in issues such as the development of Blockchains forSmart Contracts, Ithe creation of Tokens, the integration of Polkadot, the securization of besu the components of the architecture of Hyperledger fabric.

All this, during 450 hours of learning, and with a 100% online teaching methodology that adapts to the personal circumstances of the student.

This Postgraduate Diploma takes place over 6 months and is divided into 3 modules:

Module 1	Public Blockchain Development: Ethereum, Stellar and Polkadot
Module 2	Enterprise Blockchain Development: Hyperledger Besu
Module 3	Enterprise Blockchain Development: Hyperledger Fabric



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

TECH offers the possibility of developing this Postgraduate Diploma in Blockchain Development completely online. Throughout the 6 months, 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.

### tech 24 | Structure and Content

Module 1. Public Blockchain Development: Ethereum, Stellar and Polkadot									
1.1.2.	Ethereum. Public Blockchain Ethereum EVM and GAS Etherescan	<ul><li>1.2. Ethereum Development. Solidity</li><li>1.2.1. Solidity</li><li>1.2.2. Remix</li><li>1.2.3. Compilation and Execution</li></ul>	<ul><li>1.3. Ethereum Framework: Brownie</li><li>1.3.1. Brownie</li><li>1.3.2. Ganache</li><li>1.3.3. Brownie Deployment</li></ul>	<ul><li>1.4. Testing Smart Contracts</li><li>1.4.1. Test Driven Development (TDD)</li><li>1.4.2. Pytest</li><li>1.4.3. Smart Contracts</li></ul>					
	Web Connection Metamask web3.js Ether.js	<ol> <li>Real Project: Fungible Token</li> <li>ERC20</li> <li>Creating Our Token</li> <li>Deployment and Validation</li> </ol>	<ul><li>1.7. Stellar Blockchain</li><li>1.7.1. Stellar Blockchain</li><li>1.7.2. Ecosystem</li><li>1.7.3. Compared to Ethereum</li></ul>	<ul><li>1.8. Programming Stellar</li><li>1.8.1. Horizon</li><li>1.8.2. Stellar SDK</li><li>1.8.3. Fungible Token Project</li></ul>					
	Polkadot Project  Polkadot Project  Ecosystem Interaction with Ethereum and other Blockchains	1.10. Programming Polkadot 1.10.1. Substrate 1.10.2. Creating Parachain on Substrate 1.10.3. Polkadot Integration							
Mod	<b>ule 2.</b> Enterprise Blockchain Developme	ent: Hyperledger Besu							
2.1.2.	Besu Configuration Key Configuration Parameters in Production Environments Finetuning for Connected Services Good Configuration Practices	<ul><li>2.2. Blockchain Configuration</li><li>2.2.1. Key Configuration Parameters for PoA</li><li>2.2.2. Key Configuration Parameters for PoW</li><li>2.2.3. Genesis Block Configurations</li></ul>	<ul><li>2.3. Securing Besu</li><li>2.3.1. Secure the RPC with TLS</li><li>2.3.2. RPC Securitization with NGINX</li><li>2.3.3. Securitization by Means of a Node Scheme</li></ul>	<ul><li>2.4. Besu in High Availability</li><li>2.4.1. Node Redundancy</li><li>2.4.2. Balancers for Transactions</li><li>2.4.3. Transactionransaction Pool over Messaging Queue</li></ul>					
	Offchain Tools Privacy - Tessera Identidad - Alastria ID Data Indexing - Subgraph	<ul><li>2.6. Applications Developed on Besu</li><li>2.6.1. ERC20 Tokens-Based Applications</li><li>2.6.2. ERC 721 Tokens-Based Applications</li><li>2.6.3. ERC 1155 Tokens-Based Applications</li></ul>	<ul><li>2.7. Besu Deployment and Automation</li><li>2.7.1. Besu from Docker</li><li>2.7.2. Besu from Kubernetes</li><li>2.7.3. Besuin Blockchain as a Service</li></ul>	<ul> <li>2.8. Besu Interoperability with Other Clients</li> <li>2.8.1. Interoperability with Geth</li> <li>2.8.2. Interoperability with Open Ethereum</li> <li>2.8.3. Interoperability with Other DLTs</li> </ul>					
2.9.2.	Plugins for Besu Most Common Plugins Plugin Development Installation of Plugins	2.10. Configuration of							

Module 3. Enterprise Blockchain Development: Hyperledger Fabric									
3.1.2.	Hyperledger Hyperledger Ecosystem Hyperledger Tools Hyperledger Frameworks	<ul> <li>3.2. Hyperledger Fabric: Components of its Architecture. State-of-the-Art</li> <li>3.2.1. State-of-the-Art of Hyperledger Fabric</li> <li>3.2.2. Nodes</li> <li>3.2.3. Orderers</li> <li>3.2.4. CouchDB and LevelDB</li> <li>3.2.5. CA</li> </ul>		Hyperledger Fabric: Components of its Architecture. Process of a Transaction Process of a Transaction Chain Codes MSP	3.4.3.	3			
3.5.1. 3.5.2. 3.5.3.	Download Prerequisites	3.6. First Deployment 3.6.1. Automatic Test-Network Deployment 3.6.2. Guided Test-NetworkDeployment 3.6.3. Review of Deployed Components	3.7. 3.7.1. 3.7.2. 3.7.3.	Deployment of Private Data Collection Integration against a Fabric Network	3.8. 3.8.1. 3.8.2. 3.8.3.	Deployment and Upgrade of Chaincodes			
3.9. 3.9.1. 3.9.2. 3.9.3.	Tools (Caliper and Explorer)  Hyperledger Explorer Installation  Hyperledger Caliper Installation	3.10. Certification 3.10.1. Types of Official Certifications 3.10.2. Preparation for CHFA 3.10.3. PeProfile Developer vs. Administrator Profiles							





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.



### tech 28 | Methodology

## 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.





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.

### tech 30 | Methodology

#### 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.



### Methodology | 31 tech

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.





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**

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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.

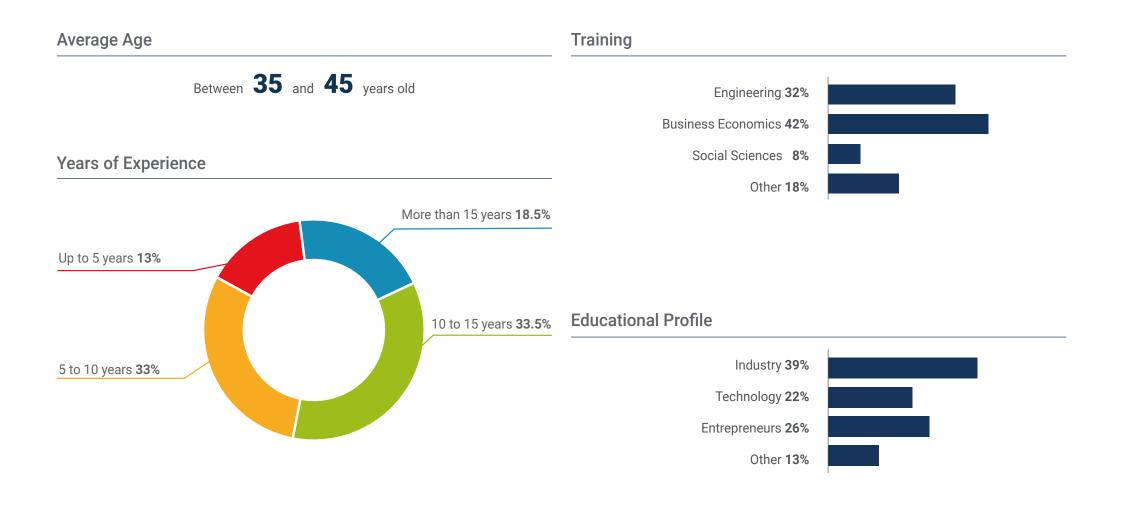


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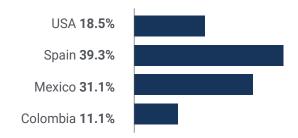




### tech 36 | Our Students' Profiles



## **Geographical Distribution**





# Servando Hidalgo

CEO of a technology company

"My company has based its success on adapting to Blockchain technology and the opportunities it offers. We hire great computer scientists, but I felt that in order to better understand the work we do, I had to catch up with them. For this reason, I was looking for a program to learn how to develop on Blockchain quickly and TECH has been the best option I have found. I can study at my own pace and his method works"





#### **International Guest Director**

Chris Sutton is a leading professional with extensive experience in the field of technology and finance, specializing in the Blockchain area. In fact, he has held the senior position of Director of the Blockchain and Digital Assets Department at Mastercard. In addition, he has been the Founder of the consulting firm N17 Capital, in which he offers advice to companies in the field of Blockchain and digital assets. So, one of his functions has been to identify the components that make up these new tools, analyze them and create working strategies.

His professional experience has included high-level roles in leading companies in the sector, such as Oasis Pro Market, where he has performed duties as Director of Blockchain Services. In addition, he has worked as Mergers and Acquisitions Product Manager at Cisco, and as Product Manager at IBM. These positions have allowed him to stand out internationally for his ability to lead teams, develop innovative strategies and manage large-scale projects.

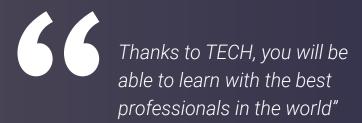
Throughout his career, he has participated in important technological and financial events. In this sense, Chris Sutton has given presentations and has been part of international panels, along with other leading experts in this sector. In this way, on the occasion of the 15th anniversary of the white paper on Bitcoin, he participated in the events of the FinTech week in Hong Kong. He also presented his expertise at a conference organized by Mastercard in Dubai on banking in the digital age and the impact of digital assets. Likewise, his analyses have focused on delving into the history, principles and future of the Blockchain.

In short, his strategic vision and outstanding skills in programming and algorithms have been key to his success in the international market, consolidating him as a leader in his field.



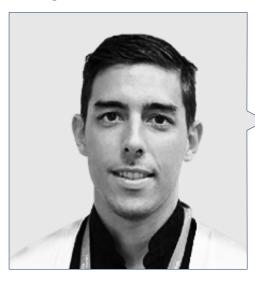
# Mr. Sutton, Chris

- Director of Blockchain and Digital Assets at Mastercard, Miami, U.S.A.
- Founder of N<sub>17</sub> Capital
- Director of Blockchain Services at Oasis Pro Market
- Mergers and Acquisitions Product Manager at Cisco
- Product Manager at IBM
- Contributor at Cointelegraph
- Master's degree in Financial Systems Engineering from University College London
- Bachelor's Degree in Computer Science from Florida International University



## tech 42 | Course Management

#### Management



## Mr. Torres Palomino, Sergio

- IT Engineer with expertise in Blockchain
- Blockchain Lead at Telefónica
- Blockchain Architect at Signeblock
- Blockchain Developer at Blocknitive
- Writer and Publisher at O'Really Media Books
- Lecturer in graduate studies and courses related to blockchain.
- Degree in Computer Engineering from San Pablo CEU University
- Master's Degree in Big Data Architecture
- Master's Degree in Big Data and Business Analytics

#### **Professors**

#### Mr. García de la Mata, Íñigo

- Senior Manager and Software Architect of the Innovation Team at Grant Thornton
- Blockchain Engineer at Alastria Blockchain Ecosystem
- Lecturer in Blockchain University courses at UNIR
- Lecturer and Blockchain Bootcamp and Geekshub
- Consultant at Ascendo Consulting Healthcare & Pharma
- Engineer at ARTECHE
- Bachelor's Degree in Industrial Engineering with a Major in Electronics
- Master's Degree in Electronics and Control from Comillas Pontifical University.
- Degree in Computer Engineering from the Spanish Open University (UNED)
- TFG tutoring at Comillas Pontifical University

#### Mr. Triguero Tirado, Enrique

- Blockchain Infrastructure Technical Manager at UPC-Threepoints
- Chief Technical Officer at Ilusiak
- Project Management Officer at Ilusiak and Deloitte
- ELK Engineer at Everis
- Systems Architect at Everis
- Degree in Technical Engineering in Computer Systems at the Polytechnic University of Valencia
- Master's Degree in Blockchain and its Business Applications from ThreePoints and the Polytechnic University of Valencia







Access a substantial salary increase thanks to your ability to function with Blockchain technology.

This program will provide it to you

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

TECH's Postgraduate Diploma in Blockchain Development is an intensive program that prepares you to face challenges and business decisions in the field of Blockchain . *Blockchain* technology. Its main objective is to promote your personal and professional growth TECH will help you achieve success.

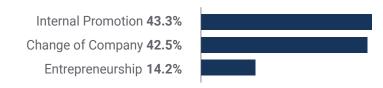
If the student wants to improve himself, achieve a positive change at a professional level and interact with the best, this is the site.

Enroll now and achieve all your goals: every minute that passes is a minute lost.

#### Time of change



#### Type of change



## Salary increase

This program represents a salary increase of more than 24.60% for our students.

\$57,100

A salary increase of

24.60%

\$71,150





## tech 50 | Benefits for Your Company

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



#### **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.



# 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.



### **Building agents of change**

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



## Increased international expansion possibilities

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







## **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.



## Increased competitiveness

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





## tech 54 | Certificate

This program will allow you to obtain your **Postgraduate Diploma in Blockchain Development** 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 Diploma in Blockchain Development

Modality: online

Duration: 6 months

Accreditation: 18 ECTS



Mr./Ms. \_\_\_\_\_, with identification document \_\_\_\_\_ has successfully passed and obtained the title of:

#### Postgraduate Diploma in Blockchain Development

This is a program of 450 hours of duration equivalent to 18 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024



<sup>\*</sup>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.



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