Executive Master's Degree

Blockchain Programming

tech global university

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Executive Master's Degree
Blockchain Programming

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/school-of-business/executive-master/master-blockchain-programming**

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01

Introduction to the Program

In the current technological landscape, innovation in Blockchain is revolutionizing various sectors, from finance to logistics, by offering secure and efficient solutions for data management. In fact, a recent study by the United Nations highlights that the implementation of this system helps improve transparency, reduce operational costs, and optimize traceability processes in supply chains. In this context, specialists need to develop advanced skills to manage solutions based on this system that meet the specific needs of each sector. To facilitate this, TECH is launching a cutting-edge online degree program focused on Blockchain Programming.

With this 100% online Executive Master's Degree, you will master the most innovative Blockchain programming languages to design secure and efficient decentralized solutions"

Blockchain technology has become one of the most widely used tools in the digital landscape, transforming management, security, and transparency processes in key sectors such as Finance, Logistics, and Healthcare. Its ability to ensure data traceability and optimize transactions has driven the need for technological professionals to acquire new skills that enable them to master this disruptive technology. However, one of the current challenges is developing decentralized applications, managing smart contracts, and exploring the opportunities offered by digital assets. Therefore, experts need to stay at the forefront of the latest techniques in this field to lead optimal projects in digital environments.

With this in mind, TECH has created a pioneering Executive Master's Degree in Blockchain Programming. The academic program covers everything from the fundamentals of public blockchains to the design of business architectures with Hyperledger Fabric. Additionally, it explores advanced applications in emerging areas such as NFTs, DeFi, and sovereign digital identity. This program will equip students with advanced skills to handle the most sophisticated tools for developing secure smart contracts, implementing decentralized applications, and managing digital assets on Blockchain platforms.

The program is delivered 100% online, allowing students to study at their own pace, with permanent access to educational materials from any device with an internet connection.

Additionally, a prestigious International Guest Director will offer 10 intensive Masterclasses.

This **Executive Master's Degree in Blockchain Programming** contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical cases presented by experts in Blockchain Programming
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- Practical exercises where self-assessment can be used to improve learning
- Special emphasis on innovative methodologies in Blockchain Programming
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Content that is accessible from any fixed or portable device with an internet connection

A renowned International Guest Director will deliver 10 exclusive Masterclasses on the latest trends in Blockchain Programming"

You will gain a comprehensive understanding of distributed architectures, decentralized networks, and the cryptographic principles that underpin blockchain technology"

You will create robust and efficient Smart Contracts, capable of eliminating the need for intermediaries.

Thanks to TECH Relearning you will be able to assimilate the essential concepts in a fast, natural and accurate way.

The teaching staff includes professionals from the Blockchain Programming field, who bring their expertise and practical experience, along with recognized specialists from leading companies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive learning experience designed to prepare for real-life situations.

This program is designed around Problem-Based Learning, whereby the student must try to solve the different professional practice situations that arise throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts.

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Why Study at TECH?

TECH is the world's largest online university. With an impressive catalog of more than 14,000 university programs, available in 11 languages, it is positioned as a leader in employability, with a 99% job placement rate. In addition, it has a huge faculty of more than 6,000 professors of the highest international prestige.

Study at the largest online university in the world and ensure your professional success. The future begins at TECH"

The world's best online university, according to FORBES

The prestigious Forbes magazine, specialized in business and finance, has highlighted TECH as "the best online university in the world" This is what they have recently stated in an article in their digital edition in which they echo the success story of this institution, "thanks to the academic offer it provides, the selection of its teaching staff, and an innovative learning method oriented to form the professionals of the future".

The best top international faculty

TECH's faculty is made up of more than 6,000 professors of the highest international prestige. Professors, researchers and top executives of multinational companies, including Isaiah Covington, performance coach of the Boston Celtics; Magda Romanska, principal investigator at Harvard MetaLAB; Ignacio Wistuba, chairman of the department of translational molecular pathology at MD Anderson Cancer Center; and D.W. Pine, creative director of TIME magazine, among others.

The world's largest online university

TECH is the world's largest online university. We are the largest educational institution, with the best and widest digital educational catalog, one hundred percent online and covering most areas of knowledge. We offer the largest selection of our own degrees and accredited online undergraduate and postgraduate degrees. In total, more than 14,000 university programs, in ten different languages, making us the largest educational institution in the world.

The most complete syllabuses on the university scene

TECH offers the most complete syllabuses on the university scene, with programs that cover fundamental concepts and, at the same time, the main scientific advances in their specific scientific areas. In addition, these programs are continuously updated to guarantee students the academic vanguard and the most demanded professional skills. and the most in-demand professional competencies. In this way, the university's qualifications provide its graduates with a significant advantage to propel their careers to success.

A unique learning method

TECH is the first university to use Relearning in all its programs. This is the best online learning methodology, accredited with international teaching quality certifications, provided by prestigious educational agencies. In addition, this innovative academic model is complemented by the "Case Method", thereby configuring a unique online teaching strategy. Innovative teaching resources are also implemented, including detailed videos, infographics and interactive summaries.

The official online university of the NBA

TECH is the official online university of the NBA. Thanks to our agreement with the biggest league in basketball, we offer our students exclusive university programs, as well as a wide variety of educational resources focused on the business of the league and other areas of the sports industry. Each program is made up of a uniquely designed syllabus and features exceptional guest hosts: professionals with a distinguished sports background who will offer their expertise on the most relevant topics.

Leaders in employability

TECH has become the leading university in employability. Ninety-nine percent of its students obtain jobs in the academic field they have studied within one year of completing any of the university's programs. A similar number achieve immediate career enhancement. All this thanks to a study methodology that bases its effectiveness on the acquisition of practical skills, which are absolutely necessary for professional development.

Google Premier Partner

The American technology giant has awarded TECH the Google Premier Partner badge. This award, which is only available to 3% of the world's companies, highlights the efficient, flexible and tailored experience that this university provides to students. The recognition not only accredits the maximum rigor, performance and investment in TECH's digital infrastructures, but also places this university as one of the world's leading technology companies.

The top-rated university by its students

Students have positioned TECH as the world's top-rated university on the main review websites, with a highest rating of 4.9 out of 5, obtained from more than 1,000 reviews. These results consolidate TECH as the benchmark university institution at an international level, reflecting the excellence and positive impact of its educational model.

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Syllabus

The teaching materials for this Master's Degree have been designed by Blockchain technology specialists, with a specific focus on the Hyperledger ecosystem. The curriculum delves into key tools such as Hyperledger Tools, providing graduates with the necessary knowledge to implement secure and scalable business solutions. Additionally, the program explores the state of the art in Hyperledger Fabric, analyzing its essential architectural components such as nodes, orderers, and distributed databases, enabling students to develop innovative projects tailored to market needs.

You will address the use of innovative technologies such as Decentralized Finance or Non-Fungible Tokens"

Module 1. Development with Public Blockchain: Ethereum, Stellar and Polkadot

1.1. Ethereum. Public Blockchain
- 1.1.1. Ethereum
- 1.1.2. EVM and GAS
- 1.1.3. Etherescan

1.2. Running Ethereum: Solidity
- 1.2.1. Solidity
- 1.2.2. Remix
- 1.2.3. Compilation and Execution

1.3. Ethereum Framework: *Brownie*
- 1.3.1. Brownie
- 1.3.2. Ganache
- 1.3.3. Brownie Deployment

1.4. *Testing Smart Contracts*
- 1.4.1. Test Driven Development (TDD)
- 1.4.2. Pytest
- 1.4.3. Smart Contracts

1.5. Web Connection
- 1.5.1. Metamask
- 1.5.2. web3.js
- 1.5.3. Ether.js

1.6. Real Project: Fungible Token
- 1.6.1. ERC20
- 1.6.2. Creating Our Token
- 1.6.3. Deployment and Validation

1.7. Stellar Blockchain
- 1.7.1. Stellar Blockchain
- 1.7.2. Ecosystem
- 1.7.3. Compared to Ethereum

1.8. Programming in Stellar
- 1.8.1. Horizon
- 1.8.2. Stellar SDK
- 1.8.3. Fungible Token Project

1.9. Polkadot Project
- 1.9.1. Polkadot Project
- 1.9.2. Ecosystem
- 1.9.3. Interaction with Ethereum and Other Blockchain

1.10. Programming Polkadot
- 1.10.1. Substrate
- 1.10.2. Creating Parachain on Substrate
- 1.10.3. Polkadot Integration

Module 2. Blockchain Technology: Technologies Involved and Cyberspace Security

2.1. Cryptography in Blockchain
2.2. The Hash in Blockchain
2.3. Private Sharing Multi-Hasing (PSM Hash)
2.4. Digital Signatures in Blockchain
2.5. Key Management. *Wallets*
2.6. Encryption
2.7. On-Chain and Off-Chain Data
2.8. Security and Smart Contracts

Module 3. Corporate Blockchain Development: Hyperledger Besu

3.1. Besu Configuration
- 3.1.1. Key Configuration Parameters in Production Environments
- 3.1.2. Finetuning for Connected Services
- 3.1.3. Good Configuration Practices

3.2. Blockchain Configuration
- 3.2.1. Key Configuration Parameters for PoA
- 3.2.2. Key Configuration Parameters for PoW
- 3.2.3. Genesis Block Configurations

3.3. Securing Besu
- 3.3.1. Secure the RPC with TLS
- 3.3.2. RPC Securitization with NGINX
- 3.3.3. Securitization by Means of a Node Scheme

3.4. Besu in High Availability
  3.4.1. Node Redundancy
  3.4.2. Balancers for Transactions
  3.4.3. Transaction Pool over Messaging Queue
3.5. Off-Chain Tools
  3.5.1. Privacy - Tessera
  3.5.2. Identidad - Alastria ID
  3.5.3. Data Indexing - Subgraph
3.6. Applications Developed on Besu
  3.6.1. ERC20 Token-Based Applications
  3.6.2. ERC 721 Token-Based Applications
  3.6.3. ERC 1155 Token-Based Applications
3.7. Besu Deployment and Automation
  3.7.1. Besu over Docker
  3.7.2. Besu over Kubernetes
  3.7.3. Besu in Blockchain as a Service
3.8. Besu Interoperability with Other Clients
  3.8.1. Interoperability with Geth
  3.8.2. Interoperability with Open Ethereum
  3.8.3. Interoperability with Other DLTs
3.9. Plugins for Besu
  3.9.1. Most Common Plugins
  3.9.2. Plugin Development
  3.9.3. Installation of Plugins
3.10. Configuration of Development Environments
  3.10.1. Creation of a Developing Environment
  3.10.2. Creation of a Customer Integration Environment
  3.10.3. Creating a Pre-Production Environment for Load Testing

Module 4. Corporate Blockchain Development: Hyperledger Fabric

4.1. Hyperledger
  4.1.1. Hyperledger Ecosystem
  4.1.2. Hyperledger Tools
  4.1.3. Hyperledger Frameworks
4.2. Hyperledger Fabric – Components of Its Architecture. State of the Art
  4.2.1. State of the Art of Hyperledger Fabric
  4.2.2. Nodes
  4.2.3. Orderers
  4.2.4. CouchDB and LevelDB
  4.2.5. CA
4.3. Hyperledger Fabric-Components of Its Architecture. Process of a Transaction
  4.3.1. Process of a Transaction
  4.3.2. *Chain Codes*
  4.3.3. MSP
4.4. Enabling Technologies
  4.4.1. Go
  4.4.2. Docker
  4.4.3. Docker Compose
  4.4.4. Other Technologies
4.5. Pre-Requisite Installation and Environment Preparation
  4.5.1. Server Preparation
  4.5.2. Download Prerequisites
  4.5.3. Download from Official Hyperledger Repository
4.6. First Deployment
  4.6.1. Automatic Test-Network Deployment
  4.6.2. Guided Test-Network Deployment
  4.6.3. Review of Deployed Components
4.7. Second Deployment
  4.7.1. Deployment of Private Data Collection
  4.7.2. Integration with a Fabric Network
  4.7.3. Other Projects

4.8. *Chaincodes*
- 4.8.1. Structure of a Chaincode
- 4.8.2. Deploying and Upgrading Chaincodes
- 4.8.3. Other Important Functions in Chaincodes

4.9. Connection to Other Hyperledger Tools (Caliper and Explorer)
- 4.9.1. Hyperledger Explorer Installation
- 4.9.2. Hyperledger Caliper Installation
- 4.9.3. Other Important Tools

4.10. Certification
- 4.10.1. Types of Official Certifications
- 4.10.2. Preparation for CHFA
- 4.10.3. Developer vs. Administrator Profiles

Module 5. Sovereign Identity Based on Blockchain

5.1. Digital Identity
- 5.1.1. Personal Data
- 5.1.2. Social Media
- 5.1.3. Control Over Data
- 5.1.4. Authentication
- 5.1.5. Identification

5.2. Blockchain Identity
- 5.2.1. Digital Signature
- 5.2.2. Public Networks
- 5.2.3. Permitted Networks

5.3. Sovereign Digital Identity
- 5.3.1. Needs
- 5.3.2. Components
- 5.3.3. Applications of SOFCs

5.4. Decentralized Identifiers (DIDs)
- 5.4.1. Layout
- 5.4.2. DID Methods
- 5.4.3. DID Documents

5.5. Verifiable Credentials
- 5.5.1. Components
- 5.5.2. Flows
- 5.5.3. Security and Privacy
- 5.5.4. Blockchain to Register Verifiable Credentials

5.6. Blockchain Technologies for Digital Identity
- 5.6.1. Hyperledger Indy
- 5.6.2. Sovrin
- 5.6.3. uPort
- 5.6.4. IDAlastria

5.7. European Blockchain and Identity Initiatives
- 5.7.1. eIDAS
- 5.7.2. EBSI
- 5.7.3. ESSIF

5.8. Digital Identity of Things (IoT)
- 5.8.1. IoT Interactions
- 5.8.2. Semantic Interoperability
- 5.8.3. Data Security

5.9. Digital Identity of Processes
- 5.9.1. Data
- 5.9.2. Codes
- 5.9.3. Interfaces

5.10. Blockchain Digital Identity Use Cases
- 5.10.1. Health
- 5.10.2. Education
- 5.10.3. Logistics
- 5.10.4. Public Administration

Module 6. Blockchain and Its New Applications: DeFi and NFT

6.1. Financial Culture
- 6.1.1. Evolution of Money
- 6.1.2. FIAT Money vs. Decentralized Money
- 6.1.3. Digital Banking vs. Open Finance

6.2. Ethereum
- 6.2.1. Technology
- 6.2.2. Decentralized Money
- 6.2.3. *Stable Coins*

6.3. Other Technologies
- 6.3.1. *Binance Smart Chain*
- 6.3.2. Polygon
- 6.3.3. Solana

6.4. DeFi (Decentralized Finance)
- 6.4.1. DeFi (Decentralized Finance)
- 6.4.2. Challenges
- 6.4.3. Open Finance Vs. DeFi

6.5. Information Tools
- 6.5.1. Metamask and Decentralized Wallets
- 6.5.2. CoinMarketCap
- 6.5.3. DefiPulse

6.6. *Stable Coins*
- 6.6.1. Protocol Maker
- 6.6.2. USDC, USDT, BUSD
- 6.6.3. Forms of Collateralization and Risks

6.7. Exchanges and Decentralized Exchanges and Platforms (DEX)
- 6.7.1. Uniswap
- 6.7.2. SushiSwap
- 6.7.3. AAVe
- 6.7.4. dYdX / Synthetix

6.8. NFT Ecosystem (Non-Fungible Tokens)
- 6.8.1. NFTs
- 6.8.2. Types
- 6.8.3. Characteristics

6.9. Capitulation of Industries
- 6.9.1. Design Industry
- 6.9.2. Fan Token Industry
- 6.9.3. Project Financing

6.10. NFT Markets
- 6.10.1. Opensea
- 6.10.2. Rarible
- 6.10.3. Customized Platforms

Module 7. Blockchain. Legal Implications

7.1. Bitcoin
- 7.1.1. Bitcoin
- 7.1.2. Whitepaper Analysis
- 7.1.3. Operation of the Proof of Work

7.2. Ethereum
- 7.2.1. Ethereum. Origins
- 7.2.2. Proof of Stake Operation
- 7.2.3. DAO Case

7.3. Current Status of the Blockchain
- 7.3.1. Growth of Cases
- 7.3.2. Blockchain Adoption by Large Companies

7.4. MiCA (Market in Cryptoassets)
- 7.4.1. Birth of the Standard
- 7.4.2. Legal Implications (Obligations, Obligated Parties, etc.)
- 7.4.3. Summary of the Standard

7.5. Prevention of Money Laundering
- 7.5.1. Fifth Directive and its Transposition
- 7.5.2. Obligated Parties
- 7.5.3. Intrinsic Obligations

7.6. Tokens
- 7.6.1. Tokens
- 7.6.2. Types
- 7.6.3. Applicable Regulations in Each Case

7.7. ICO/STO/IEO: Corporate Financing Systems
- 7.7.1. Types of Financing
- 7.7.2. Applicable Regulations
- 7.7.3. Success Stories

7.8. NFT (Non-Fungible Tokens)
- 7.8.1. NFT
- 7.8.2. Applicable Regulations
- 7.8.3. Use Cases and Success (*Play to Earn*)

7.9. Taxation and Cryptoassets
- 7.9.1. Taxation
- 7.9.2. Income from Employment
- 7.9.3. Income from Economic Activities

7.10. Other Applicable Regulations
- 7.10.1. General Data Protection Regulation
- 7.10.2. DORA (Cybersecurity)
- 7.10.3. EIDAS Regulations

Module 8. Blockchain Architecture Design

8.1. Blockchain Architecture Design
- 8.1.1. Architecture
- 8.1.2. Infrastructure Architecture
- 8.1.3. Software Architecture
- 8.1.4. Integration Deployment

8.2. Types of Networks
- 8.2.1. Public Networks
- 8.2.2. Private Networks
- 8.2.3. Permitted Networks
- 8.2.4. Differences

8.3. Participant Analysis
- 8.3.1. Company Identification
- 8.3.2. Customer Identification
- 8.3.3. Consumer Identification
- 8.3.4. Interaction Between Parties

8.4. Proof-of-Concept Design
- 8.4.1. Functional Analysis
- 8.4.2. Implementation Phases

8.5. Infrastructure Requirements
- 8.5.1. Cloud
- 8.5.2. Physical
- 8.5.3. Hybrid

8.6. Security Requirements
- 8.6.1. Certification
- 8.6.2. HSM
- 8.6.3. Encryption

8.7. Communications Requirements
- 8.7.1. Network Speed Requirements
- 8.7.2. I/O Requirements
- 8.7.3. Transaction Requirements Per Second
- 8.7.4. Affecting Requirements with the Network Infrastructure

8.8. Software Testing, Performance and Stress Testing
- 8.8.1. Unit Testing in Development and Pre-Production Environments
- 8.8.2. Infrastructure Performance Testing
- 8.8.3. Pre-Production Testing
- 8.8.4. Production Testing
- 8.8.5. Version Control

8.9. Operation and Maintenance
- 8.9.1. Support: Alerts
- 8.9.2. New Versions of Infrastructure Components
- 8.9.3. Risk Analysis
- 8.9.4. Incidents and Changes

8.10. Continuity and Resilience
- 8.10.1. *Disaster Recovery*
- 8.10.2. *Backup*
- 8.10.3. New Participants

Module 9. Blockchain Applied to Logistics

9.1. Operational AS IS Mapping and Possible Gaps
- 9.1.1. Identification of Manually Executed Processes
- 9.1.2. Identification of Participants and Their Particularities
- 9.1.3. Case Studies and Operational Gaps
- 9.1.4. Presentation and Mapping Executive Staff

9.2. Map of Current Systems
- 9.2.1. Current Systems
- 9.2.2. Master Data and Information Flow
- 9.2.4. Governance Model

9.3. Application of Blockchain to Logistics
- 9.3.1. Blockchain Applied to Logistics
- 9.3.2. Traceability-Based Architectures for Business Processes
- 9.3.3. Critical Success Factors in Implementation
- 9.3.4. Practical Tips

9.4. TO BE Model
- 9.4.1. Operational Definition for Supply Chain Control
- 9.4.2. Structure and Responsibilities of the Systems Plan
- 9.4.3. Critical Success Factors in Implementation

9.5. Construction of the Business Case
- 9.5.1. Cost Structure
- 9.5.2. Projected Benefits
- 9.5.3. Approval and Acceptance of the Plan by the Owners

9.6. Creation of Proof of Concept (POC)
- 9.6.1. Importance of a POC for New Technologies
- 9.6.2. Key Aspects
- 9.6.3. Examples of POCs with Low Cost and Effort

9.7. Project Management
- 9.7.1. Agile Methodology
- 9.7.2. Decision of Methodologies Among All Participants
- 9.7.3. Strategic Development and Deployment Plan

9.8. Integration of Systems: Opportunities and Needs
- 9.8.1. Structure and Development of the Systems Planning
- 9.8.2. Data Master Model
- 9.8.3. Roles and Responsibilities
- 9.8.4. Integrated Management and Monitoring Model

9.9. Development and Implementation with the Supply Chain Team
- 9.9.1. Active Participation of the Customer (Business)
- 9.9.2. Systemic and Operational Risk Analysis
- 9.9.3. Event Key: Test Models and Post-Production Support

9.10. Change Management: Follow-Up and Updating
- 9.10.1. Management Implications
- 9.10.2. Rollout Plan and Training Program
- 9.10.3. KPI Tracking and Management Models

Module 10. Blockchain and Business

10.1. Applying Technology throughout the Company
- 10.1.1. Applying Blockchain
- 10.1.2. Blockchain Benefits
- 10.1.3. Common Implementation Mistakes

10.2. Blockchain Implementation Cycle
- 10.2.1. From P2P to Distributed Systems
- 10.2.2. Key Aspects for Proper Implementation
- 10.2.3. Improving Current Implementations

10.3. Blockchain vs. Traditional Technologies. Foundations
- 10.3.1. APIs Data and Flows
- 10.3.2. Tokenization as a Cornerstone for Projects
- 10.3.3. Incentives

10.4. Selecting Blockchain Type
- 10.4.1. Public Blockchain
- 10.4.2. Private Blockchain
- 10.4.3. Consortiums

10.5. Blockchain and the Public Sector
- 10.5.1. Blockchain in the Public Sector
- 10.5.2. Central Bank Digital Currency (CBDC)
- 10.5.3. Conclusions

10.6. Blockchain and the Financial Sector Start
- 10.6.1. CBDC and Banking
- 10.6.2. Native Digital Assets
- 10.6.3. Where It Does Not Fit

10.7. Blockchain and the Pharmaceutical Sector
- 10.7.1. Searching for Meaning in the Field
- 10.7.2. Logistics or Pharmacy
- 10.7.3. Application

10.8. Pseudo Private Blockchains. Consortiums: Meaning of Consortiums
- 10.8.1. Reliable Environments
- 10.8.2. Analysis and Delving Deeper
- 10.8.3. Valid Implementations

10.9. Blockchain. Use Case in Europe: EBSI
- 10.9.1. EBSI (European Blockchain Services Infrastructure)
- 10.9.2. The Business Model
- 10.9.3. The Future

10.10. The Future of Blockchain
- 10.10.1. Trilemma
- 10.10.2. Automation
- 10.10.3. Conclusions

You will securely manage digital wallets and transactions across multiple Blockchain platforms"

04

Teaching Objectives

This Postgraduate Certificate from TECH is designed to provide specialists with the necessary tools to integrate and apply Blockchain technology in business environments. Through this program, graduates will acquire advanced competencies to develop and implement decentralized solutions, create secure smart contracts, and optimize processes through blockchain-based applications. In addition, they will be prepared to lead technological innovation projects, manage digital transactions efficiently, and ensure data integrity in corporate environments.

You will create innovative solutions for decentralized commerce, peer-to-peer lending, and the management of unique digital assets"

General Objectives

- Develop advanced knowledge of Blockchain technology, understanding its impact and potential in optimizing business and technological processes
- Identify Blockchain applications in data management, enhancing transparency, security, and efficiency across various sectors
- Implement smart contracts on platforms such as Ethereum to automate digital transactions and processes in a secure and efficient manner
- Integrate solutions based on Hyperledger Fabric for the development of secure, scalable business infrastructures tailored to market needs
- Apply advanced techniques in cryptography, wallet management, and data protection to ensure security in digital transactions
- Utilize platforms such as Polkadot and Stellar Blockchain to create interoperable applications and optimize processes in decentralized environments
- Design and implement sovereign digital identity projects using Blockchain technologies to improve privacy and control of personal data
- Foster continuous learning in Blockchain technologies, ensuring that specialists remain up to date with the latest innovations and market trends

Specific Objectives

Module 1. Development with Public Blockchain: Ethereum, Stellar and Polkadot

- Analyze the basic principles of Blockchain technology and its historical evolution from its origins to current applications across diverse sectors
- Understand the functioning of public and private Blockchains, exploring platforms such as Ethereum
- Study the essential concepts of smart contracts and their impact on the automation of digital processes
- Explore the structure of fungible and non-fungible tokens (NFTs), analyzing their relevance in the digital economy

Module 2. Blockchain Technology: Technologies Involved and Cyberspace Security

- Master the fundamentals of cryptography applied to Blockchain technology, including hashing and encryption techniques
- Analyze the functioning of wallets and their importance in key management and secure transactions
- Understand the concept of on-chain and off-chain data and its impact on network security
- Explore privacy mechanisms in Blockchain, such as Private Sharing Multi-Hashing

Module 3. Corporate Blockchain Development: Hyperledger Besu

- Explore the Hyperledger ecosystem and its relevance in creating enterprise Blockchain solutions
- Analyze the key components of Hyperledger Fabric architecture, including nodes, orderers, and distributed databases
- Study the process of deploying private Blockchain networks using Hyperledger Fabric
- Apply Hyperledger tools to develop and implement secure and scalable applications

Module 4. Corporate Blockchain Development: Hyperledger Fabric

- Implement smart contracts on platforms such as Ethereum, using programming languages like Solidity
- Apply development methodologies such as Test-Driven Development and tools like Pytest to evaluate smart contracts
- Develop and implement real-world projects for the creation and validation of ERC20 tokens
- Automate processes with Hyperledger Besu and analyze their impact in business environments

Module 5. Sovereign Identity Based on Blockchain

- Understand the concept of sovereign digital identity and its importance in the management of personal data
- Analyze the use of decentralized identifiers (DIDs) and verifiable credentials in digital environments
- Explore the role of Blockchain in data protection and digital privacy
- Evaluate use cases of digital identity in sectors such as healthcare, logistics, and public administration

Module 6. Blockchain and Its New Applications: DeFi and NFT

- Study the fundamentals of DeFi and their impact on the global financial system
- Explore the functioning of decentralized exchange platforms and their relevance in the crypto market
- Analyze the NFT ecosystem and its applications in industries such as digital art and video games
- Evaluate the risks and benefits of stablecoins and their role in decentralized finance

Module 7. Blockchain. Legal Implications

- Analyze the legal evolution of Blockchain technology and its regulation at a global level
- Study the impact of regulations such as MiCA (Markets in Crypto-Assets) and the Fifth Anti-Money Laundering Directive
- Explore the tax implications of crypto-assets and their treatment across different jurisdictions
- Evaluate the regulation of NFTs and other digital assets in the context of data protection

Module 8. Blockchain Architecture Design

- Design secure and scalable Blockchain architectures for business applications
- Analyze the different types of networks (public, private, and permissioned) and their applicability in business contexts
- Evaluate security, infrastructure, and communication requirements in digital environments
- Implement performance, stress, and version control testing to validate the developed architecture

Module 9. Blockchain Applied to Logistics

- Identify logistics processes that can be optimized through the use of Blockchain
- Design traceability models that enhance efficiency and transparency in the supply chain
- Develop proof-of-concept projects to validate Blockchain solutions in real logistics environments
- Analyze opportunities for system integration and change management in logistics projects

Module 10. Blockchain and Business

- Explore the implementation cycle of Blockchain projects in corporate environments
- Analyze the differences between public, private, and consortium Blockchains according to business objectives
- Evaluate real use cases in key sectors such as finance, pharmaceuticals, and the public sector
- Investigate the future of Blockchain technology, its current challenges, and its potential for automation

05

Career Opportunities

This university program from TECH represents a unique opportunity for specialists who wish to update their competencies and master Blockchain technology tools, which today have a significant impact on business and technological innovation. Through this advanced knowledge, graduates of this degree will be able to broaden their career opportunities and lead digital transformation projects.

You will be a leader in the development of disruptive technological solutions, applying Blockchain to drive innovation across any sector"

Graduate Profile

The graduate of this Executive Master's Degree from TECH will be a professional fully qualified to integrate Blockchain-based solutions across different sectors, enhancing operational efficiency and data management. They will possess the skills to design, implement, and evaluate decentralized systems that foster technological innovation and optimize critical processes. In addition, they will be prepared to address the legal, privacy, and security challenges posed by the use of this technology. This specialist will also be capable of leading innovation projects, as well as promoting continuous learning in the field of digital assets and business transformation.

Do you aspire to work professionally as a Blockchain Developer? This university degree will provide you with the essential tools to achieve it in just a few months.

- Integration of Blockchain in Business Environments: Ability to apply Blockchain technology across different sectors, enhancing transparency, security, and efficiency in processes
- **Solving Complex Technological Challenges:** Skills to develop innovative solutions through the design of smart contracts and decentralized platforms
- **Ethical Commitment and Digital Security:** Responsibility in applying ethical standards and data protection regulations, ensuring privacy in the use of Blockchain
- **Interdisciplinary Collaboration:** Capacity to work within multidisciplinary teams, integrating Blockchain technology into diverse business projects

After completing the Executive Master's Degree, you will be able to use your knowledge and skills in the following positions:

1. **Blockchain Solutions Developer:** Responsible for creating and managing decentralized applications, smart contracts, and secure platforms.
2. **Blockchain Cybersecurity Specialist:** Ensures data protection and transaction integrity in digital environments.
3. **Digital Transformation Consultant with Blockchain:** Advises companies on the implementation of Blockchain-based solutions to optimize processes and increase efficiency.
4. **Enterprise Blockchain Project Manager:** Leads technological projects that implement disruptive solutions in sectors such as finance, logistics, or healthcare.
5. **Cryptoassets and Decentralized Finance Analyst:** Expert in analyzing digital markets, focused on the use of cryptoassets and decentralized finance platforms.
6. **Sovereign Digital Identity Specialist:** Responsible for designing and implementing identity management solutions based on Blockchain technology.
7. **Blockchain Infrastructure Architect:** In charge of designing secure and scalable infrastructures for companies seeking to implement advanced digital solutions.
8. **Legal Consultant in Digital Assets:** Specialized advisor in the legal framework of cryptoassets, NFTs, and Blockchain platforms, ensuring regulatory compliance"

06

Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.

TECH will prepare you to face new challenges in uncertain environments and achieve success in your career"

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.
The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

"At TECH you will NOT have live classes (which you might not be able to attend)"

The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

> *TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want"*

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.

Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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.

A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

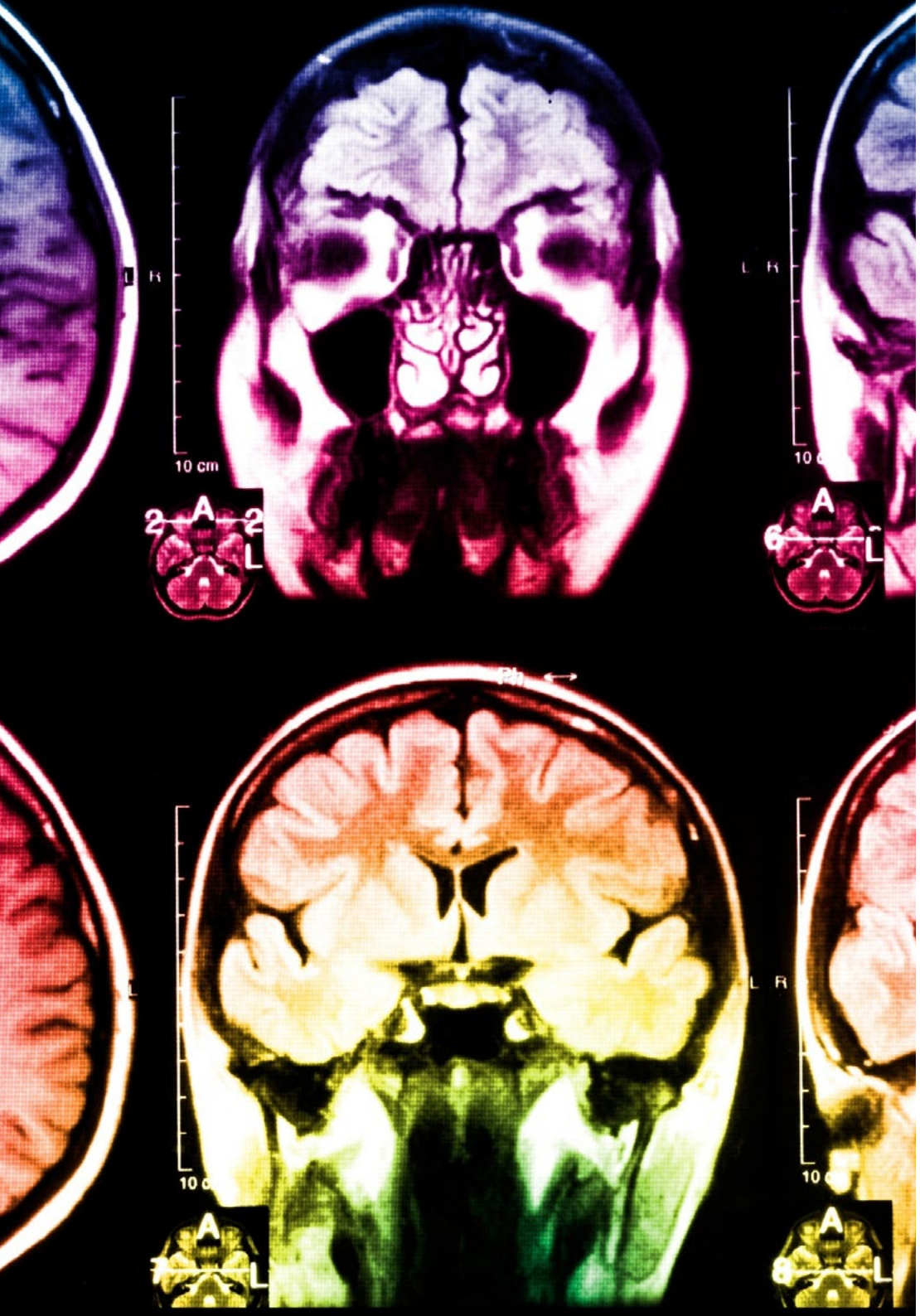
In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.

The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule"

The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the teaching quality, the quality of the materials, the structure of the program and its objectives is excellent. Not surprisingly, the institution became the top-rated university by its students according to the global score index, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.

As such, the best educational materials, thoroughly prepared, will be available in this program:

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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.

Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.

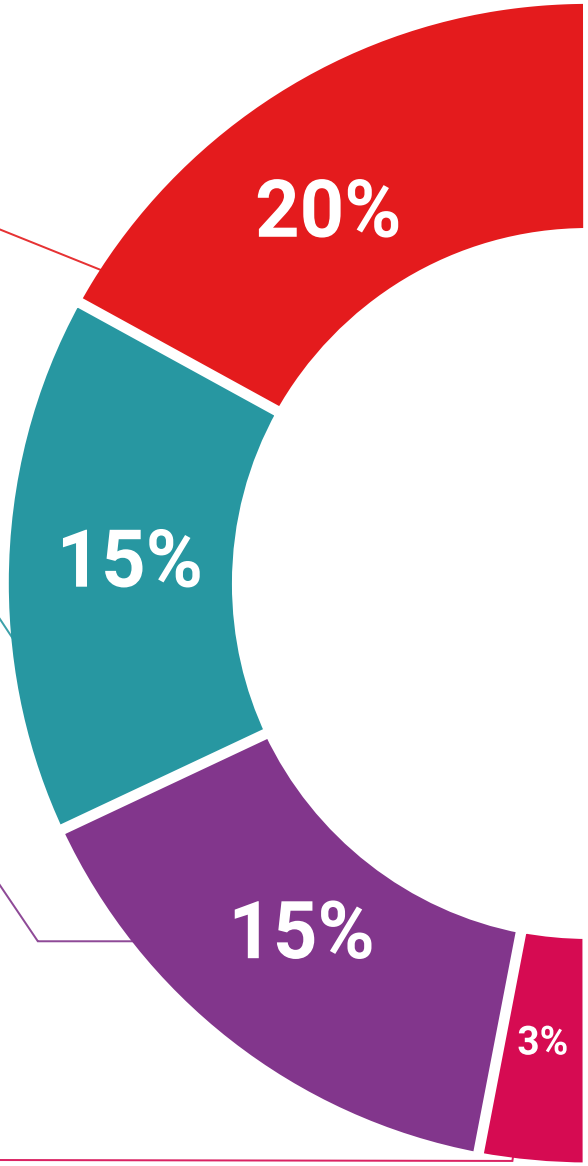
Interactive Summaries

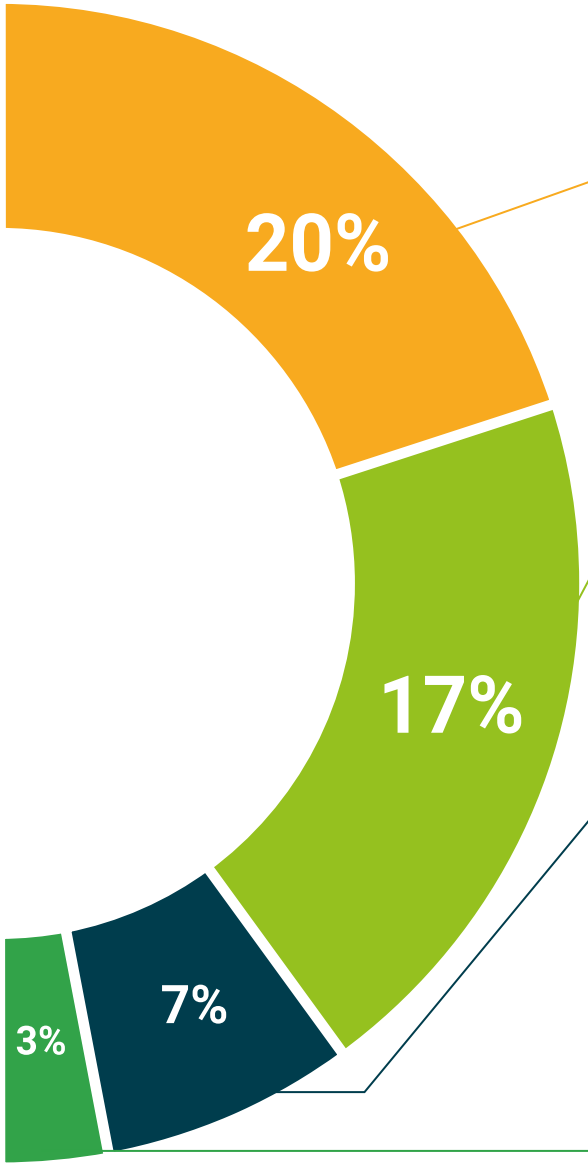
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".

Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





Case Studies

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Testing & Retesting

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.

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 for future difficult decisions.

Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical and effective way to help students progress in their learning.

07

Teaching Staff

The teaching staff of this Executive Master's Degree in Blockchain Programming is composed of active experts in blockchain, who will share with their students all the essential insights in this field, enabling them to later apply this knowledge within their own companies. In this way, the program ensures that everything learned throughout this university degree has a practical application that will substantially enhance the future prospects of their organizations.

You will have the full support of the faculty team, made up of true experts in Blockchain Programming"

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**. Therefore, one of his functions has been to identify the components that make up these new tools, analyze them and create work strategies.

His professional experience has included high-level roles in leading companies in the sector, such as **Oasis Pro Market**where he has worked 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. Therefore, 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 knowledge at a conference organized by **Mastercard**, in **Dubai**, on **banking in the digital era** and the **the impact of digital assets**. Likewise, his analysis have focused on delving into the history, principles and future of the ***Blockchain***.

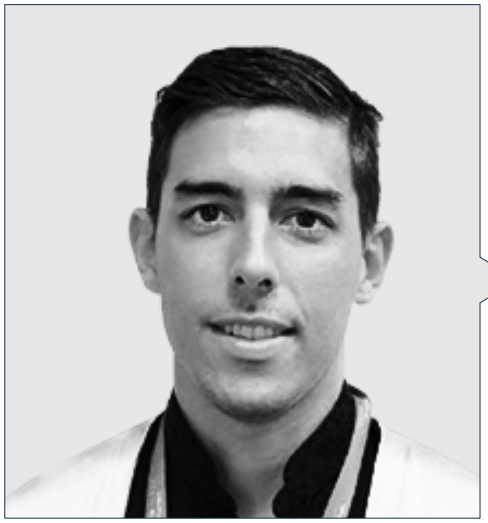
In short, his strategic vision and his outstanding skills in **programming** and **algorithms** have been key to his success in the **International market**consolidating him as a reference in his field.

Mr. Sutton, Chris

- Director of *Blockchain* and Digital Assets at Mastercard, Miami, USA
- Founder of N17 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

Thanks to TECH, you will be able to learn with the best professionals in the world"

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'Reily Media Books
- Professor in postgraduate studies and Blockchain related courses
- Degree in Computer Engineering from CEU San Pablo University
- Master's Degree in Big Data Architecture
- Master's Degree in Big Data and Business Analytics

Teachers

Mr. Triguero Tirado, Enrique

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

Ms. Salgado Iturrino, María

- Software Engineer with expertise in Blockchain
- Blockchain Manager Iberia & LATAM at Inetum
- Identity Comission Core Team Leader at Alastria Blockchain Ecosystem
- Software Developer at Indra
- Teacher in postgraduate studies related to Blockchain
- Degree in Software Engineering from the Complutense University of Madrid
- Master's Degree in Computer Engineering from the Polytechnic University of Madrid
- University Expert in Blockchain Application Development

Mr. Callejo González, Carlos

- CEO and Founder of Block Impulse
- Chief Technology Officer at Stoken Capital
- Advisor at Crypto Actual Club
- Advisor in Cryptocurrencies for All Plus
- Master's Degree in Applied Blockchain
- Superior Degree in Information Systems and Telecommunications

Ms. Carrascosa Cobos, Cristina

- Lawyer expert in Technology Law and use of ICTs
- Director and Founder of ATH21
- Columnist at CoinDesk
- Lawyer at Cuatrecasas Law Firm
- Lawyer at Broseta Law Firm
- Lawyer at Pinsent Masons Law Firm
- Master's Degree in Business Consultancy from IE Law School
- Master's Degree in Taxation and Taxation by CEF
- Degree in Law from the University of Valencia

Mr. Vaño Francés, Juan Francisco

- Engineer in Computer Science
- Solidity Engineer at Vivatopia
- Senior Computer Technician at R. Belda Lloréns
- Computer Science Engineer at the Polytechnic University of Valencia
- Specialized in DApp programming and Smart Contract development with Solidity
- Course in Data Science Tools

Mr. Herencia, Jesús

- Director of Digital Assets at OARO
- Founder and Blockchain Consultant at Shareyourworld
- IT Manager at Crédit Agricole Leasing & Factoring
- CEO of Blockchain Open Lab
- IT Manager at Mediasat
- Diploma in Computer Systems Engineering from the Polytechnic University of Madrid
- Secretary General of AECHAIN
- Member of: Academic Committee for the Promotion of Cryptoassets and DLT Technology Research, Ethereum Madrid, AECHAIN

Ms. Foncuberta, Marina

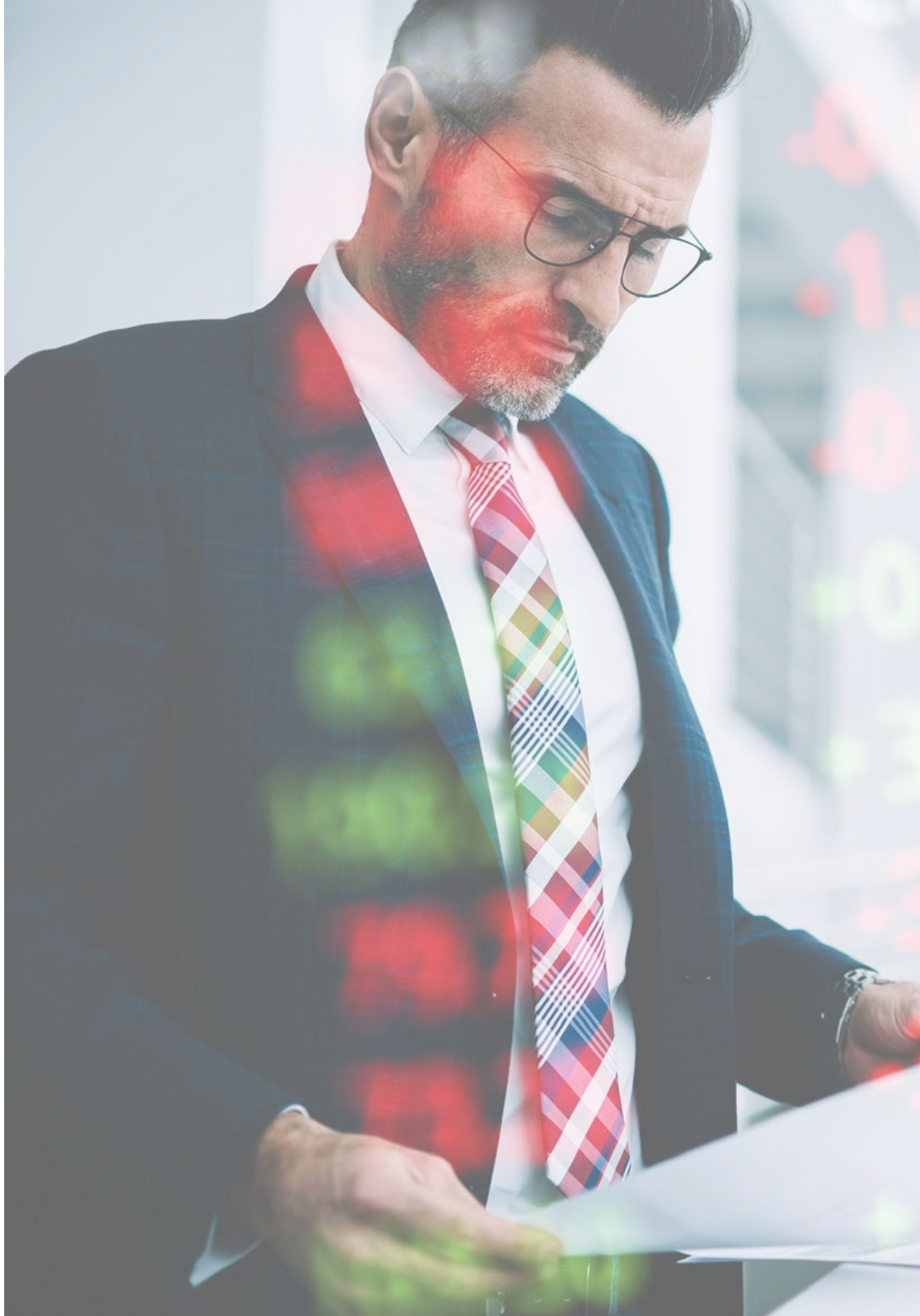
- Senior Associate Attorney at ATH21, *Blockchain*, Cybersecurity, IT, Privacy and Data Protection
- Professor at CEU San Pablo University of Law and New Technologies: Blockchain
- Attorney Pinsent Masons, Blockchain Cybersecurity, IT, Privacy and Data Protection Department
- Lawyer as part of Secondment Program, Technology, Privacy and Data Protection Department, Wizink
- Lawyer as part of the Secondment Program, Cybersecurity, IT, Privacy and Data Protection Department, IBM
- Law Degree and Postgraduate Certificate in Business Studies from the Comillas Pontifical University
- Master's Degree in Intellectual and Industrial Property from Comillas Pontifical University (ICADE)
- Program on Blockchain: Legal Implications

Mr. García de la Mata, Íñigo

- Senior Manager and Software Architect of the Innovation Team at Grant Thornton
- Blockchain Engineer at Alastria Blockchain Ecosystem
- Professor in Blockchain University courses at UNIR
- Professor 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. Olalla Bonal, Martín

- Senior Blockchain Practice Manager at EY
- Blockchain Client Technical Specialist for IBM
- Director of Architecture for Blocknitive
- Team Coordinator in Non-Relational Distributed Databases for WedoIT, a subsidiary of IBM
- Infrastructure Architect at Bankia
- Head of Layout Department at T-Systems
- Department Coordinator for Bing Data España SL



Mr. de Araujo, Rubens Thiago

- Manager of the IT Blockchain for Supply Chain Project at Telefónica Global Technology
- Logistics Innovation and Projects Manager at Telefónica Brazil
- Teacher of university programs in his specialty
- Master's Degree in PMI Project Management from SENAC University. Brazil
- Graduate in Technological Logistics from SENAC University. Brazil

A unique, essential and decisive learning experience to boost your professional development"

08

Certificate

The Executive Master's Degree in Blockchain Programming 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 private qualification will allow you to obtain a **Executive Master's Degree in Blockchain Programming** 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** private qualification 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: **Executive Master's Degree in Blockchain Programming**

Modality: **online**

Duration: **12 months**

Accreditation: **60 ECTS**


tech global university

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

Executive Master's Degree in Blockchain Programming

This is a private qualification of 2,700 hours of duration equivalent to 90 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

Dr. Pedro Navarro Illana
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates


Executive Master's Degree in Blockchain Programming

General Structure of the Syllabus

Subject type	ECTS
Compulsory (CO)	60
Optional (OP)	0
External Work Placement (WP)	0
Master's Degree Thesis (MDT)	0
	Total 60

General Structure of the Syllabus

Year	Subject	ECTS	Type
1º	Development with Public Blockchain: Ethereum, Stellar and Polkadot	6	CO
1º	Blockchain Technology: Technologies Involved and Cyberspace Security	6	CO
1º	Corporate Blockchain Development: Hyperledger Besu	6	CO
1º	Corporate Blockchain Development: Hyperledger Fabric	6	CO
1º	Sovereign Identity Based on Blockchain	6	CO
1º	Blockchain and Its New Applications: DeFi and NFT	6	CO
1º	Blockchain. Legal Implications	6	CO
1º	Blockchain Architecture Design	6	CO
1º	Blockchain Applied to Logistics	6	CO
1º	Blockchain and Business	6	CO

Dr. Pedro Navarro Illana
Dean

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*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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Executive Master's Degree
Blockchain Programming

- Modality: **online**
- Duration: **12 months**
- Certificate: **TECH Global University**
- Credits: **60 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Executive Master's Degree
Blockchain Programming

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