Postgraduate Diploma

Cybersecurity in Emerging Technologies

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Postgraduate Diploma
Cybersecurity in Emerging Technologies

- Modality: **online**
- Duration: **6 months**
- Certificate: **TECH Global University**
- Credits: **18 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/postgraduate-diploma/postgraduate-diploma-cybersecurity-emerging-technologies

Index

01 Introduction p. 4

02 Objectives p. 8

03 Course Management p. 12

04 Structure and Content p. 16

05 Methodology p. 22

06 Certificate p. 30

01

Introduction

Numerous technologies have appeared recently and have become rapidly popular. This, in addition to having provided new services to companies, users and customers, it has also posed a security problem. Emerging technologiesby their very nature are in continuous development and have not yet reached their optimum state of protection, so they are the target of attacks. In response to this challenge, this program has been developed, with which the computer scientist can learn about the best cybersecurity methods applied to the Internet of Things, Cloud Computing or Blockchain. In this way, you will improve your professional profile, preparing yourself to face the digital security challenges of the present and the future.

Prepare yourself to specialize in cybersecurity applied to Cloud Computing, the Blockchain or the Internet of Things with this Postgraduate Diploma, which will make you a highly sought-after professional in the best technology companies"

Emerging Technologies are here to stay. They have appeared at a time when solutions to various problems were needed. Thus, for example, the internet of things is evolving to become an essential element in many people's lives. Likewise, the Blockchain is helping to decentralize numerous processes and Cloud Computing ensures the availability of resources of all kinds, especially data or applications, anywhere, with simple access to a network connection.

As they are very useful elements and services, their popularity is growing rapidly, and this produces a decompensation, since, in many cases, they do not have adequate security because they are technologies that have yet to be 100% developed. For this reason, more and more companies, both in the electronic field and in other areas, are looking for professionals specialized in cybersecurity applied to these tools.

This Postgraduate Diploma explores, therefore, all the possibilities of cybersecurity in this type of technology, guaranteeing the computer scientist an intensive and complete deepening in this field, giving them a decisive professional impulse in their career.

All this, through an online teaching system specially designed with the working professional in mind, who will be able to combine their work with their studies in a comfortable and a simple way. And, in addition, you will have at your disposal the best teaching staff made up of true specialists in this important area of cybersecurity.

This **Postgraduate Diploma in Cybersecurity in Emerging Technologies** contains the most complete and up-to-date program on the market. Its most notable features are:

- Case studies presented by IT and cybersecurity experts
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional development
- Practical exercises where the self-assessment process can be carried out to improve learning
- Its special emphasis on innovative methodologies
- Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- Access to content from any fixed or portable device with an Internet connection

Companies of all types need specialists to bring optimal security to their Blockchain or internet of things projects"

The best online teaching system will be at your disposal so that you can study at your own pace, without rigid schedules or interruptions in your work"

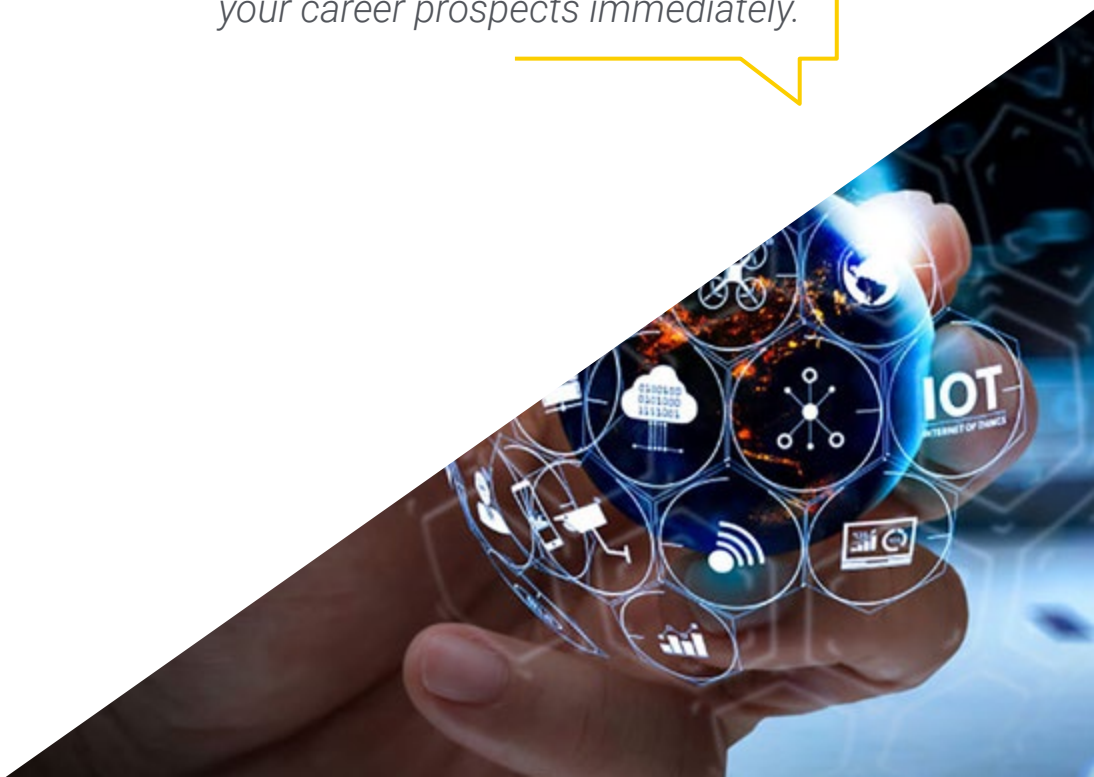
Thanks to this program, you will be able to learn more about the best cryptographic methods or the existing types of Cloud infrastructure.

Emerging technologies are the present and the future: specialize and improve your career prospects immediately.

The program's teaching staff includes professionals from sector who contribute their work experience to this training program, as well as renowned specialists from leading societies and prestigious universities.

The multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide immersive training programmed to train in real situations.

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



02

Objectives

This Postgraduate Diploma in Cybersecurity in Emerging Technologies has the following main goal main goal to turn the computer scientist into a reference specialist in this field, positioning itself as the perfect solution for any company wishing to face projects in Blockchain or Cloud Computing with total security. Thus, by completing this program, you will have the perfect professional profile for the new technological and digital environment that has been taking hold for some time now.

You will be the most sought-after professional in your environment when you complete this Postgraduate Diploma"

General Objectives

- Examine the science of cryptology and the relationship to its branches: cryptography, cryptanalysis, steganography and stegoanalysis
- Analyze the types of cryptography according to the type of algorithm and according to its use
- Compile key management systems
- Evaluate the different practical applications
- Examine digital certificates
- Examine the Public Key Infrastructure (PKI)
- Analyze the latest trends and challenges
- Examine the process of designing a security strategy when deploying corporate cloudservices
- Identify the areas of Cloudsecurity
- Analyze the services and tools in each of the security areas
- Assess the differences in the concrete implementations of different public cloud vendors
- Assess IoT connectivity options to address a project, with special emphasis on LPWAN technologies
- Present the basic specifications of the main LPWAN technologies for the IoT
- Develop security specifications for each LPWAN technology
- Analyze comparatively the security of LPWAN technologies

Specific Objectives

Module 1. Cryptography in IT

- Compile the fundamental operations (XOR, large numbers, substitution and transposition) and the various components (One-Way functions, Hash, random number generators)
- Analyze cryptographic techniques
- Develop the different cryptographic algorithms
- Demonstrate the use of digital signatures and their application in digital certificates
- Assess key management systems and the importance of cryptographic key lengths
- Examine key derivation algorithms
- Analyze key life cycle
- Evaluate block cipher and stream cipher modes
- Determine pseudorandom number generators
- Develop real-world cryptography application cases, such as Kerberos, PGP or smart cards
- Examine related associations and organizations, such as ISO, NIST or NCSC
- Determine the challenges in quantum computing cryptography

Module 2. Security in *Cloud* Environments

- Identifying risks of a public cloud infrastructure deployment
- Define security requirements
- Developing a security plan for a cloud deployment
- Identify the cloud services to be deployed for the execution of a security plan.
- Determine the operations necessary for the prevention mechanisms
- Establish guidelines for a logging and monitoring system
- Propose incident response actions

Module 3. Security in IoT Device Communications

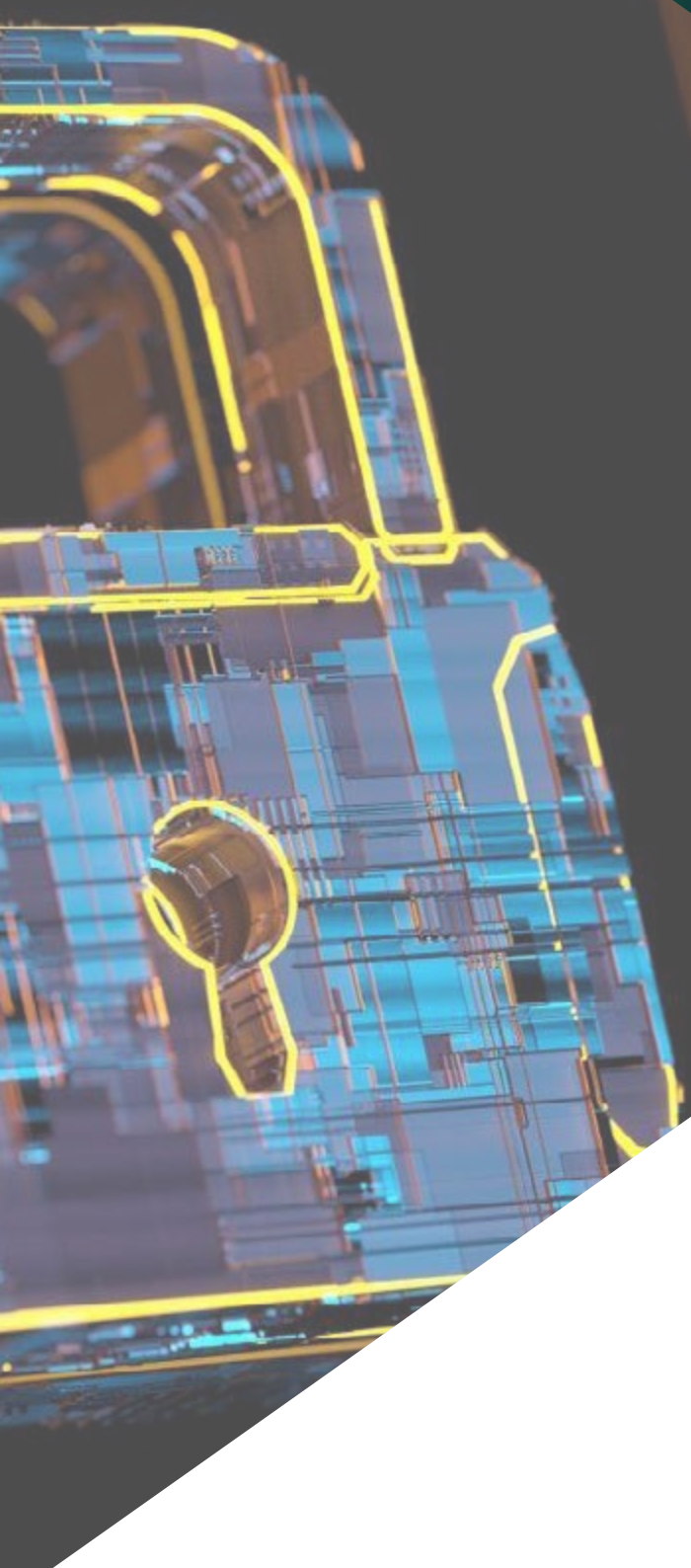
- Introduce the simplified IoT architecture
- Substantiate the differences between general connectivity technologies and connectivity technologies for IoT
- Establish the concept of the iron triangle of IoT connectivity
- Analyze the security specifications of LoRaWAN technology, NB-IoT technology and WiSUN technology
- Justify the choice of the appropriate IoT technology for each project

All your professional goals will be within your reach: enroll and become a specialist in Cybersecurity in Emerging Technologies"

03

Course Management

The current complex situation requires professionals to constantly update and deepen their knowledge. Emerging technologies are not only making inroads, but are continuously transforming as new developments emerge. Therefore, it is necessary to have the best specialists in this area, and this Postgraduate Diploma has them, so the computer scientist will be able to keep up to date with all the latest developments from the teaching of active professionals.



The most experienced faculty, working in the cybersecurity industry, will provide you with the most advanced knowledge and techniques"

Management

Mr. Olalla Bonal, Martín

- Director de Información en ePETID - Global Animal Health
- Blockchain Technical Specialist at IBM SPGI
- *Blockchain* Architect
- Infrastructure Architect in Banking
- Project management and implementation of solutions
- Digital Electronics Technician
- Teacher Hyperledger Fabric Training for companies
- Teacher Business-oriented companies Blockchain training

Professors

Mr. Sevillano Izquierdo, Javier

- Global Cyber Security Architect Vodafone Spain
- Chief Technology Security Office (CTSO) Vodafone Spain
- Responsible for Technological Security Bankia
- Responsible for Technological Security Caja Madrid
- Security Manager 4B System
- SEINCA - Senior Analyst
- Superior Technician in Business Computing at Instituto Cibernos

Mr. Gómez Rodríguez, Antonio

- Cloud Solutions Engineer at Oracle
- Project Manager at Sopra Group
- Project Manager at Everis
- Project Manager at Empresa pública de Gestion de Programas Culturales. Department of Culture of Andalusia
- Information Systems Analyst. Sopra Group
- Degree in Telecommunications Engineering from the Polytechnic University of Catalonia.
- Postgraduate Degree in Information Technologies and Systems, Catalan Institute of Technology
- E-Business Master, La Salle School of Business

Mr. del Valle Arias, Jorge

- Smart Cities Business Growth Manager Spain en Itron Inc
- IoT Consultor
- IoT Division Director at Diode Spain
- Sales Manager IoT & Celular at Aicox Solutions
- Founder and CEO of Sensor Intelligence
- Operations Manager at Codium Networks
- Head of Electronics at Aitemin
- Telecommunications Engineer from the Polytechnic University of Madrid
- Executive MBA from the International Graduate School of La Salle in Madrid

04

Structure and Content

This Postgraduate Diploma in Cybersecurity in Emerging Technologies is composed of 3 specialized modules that will be developed over 450 hours of intensive learning. And, from this structure, the computer scientist will be able to delve into relevant aspects of cybersecurity such as the mathematical foundations of cryptography, the use of algorithms in security, security in public clouds and the main security vulnerabilities of the IoT.

The most complete contents about cybersecurity applied to emerging technologies are in this program. Don't wait any longer and enroll"

Module 1. Cryptography in IT

1.1. Cryptography
- 1.1.1. Cryptography
- 1.1.2. Fundamentals of Mathematics

1.2. Cryptology
- 1.2.1. Cryptology
- 1.2.2. Cryptanalysis
- 1.2.3. Steganography and Stegoanalysis

1.3. Cryptographic Protocols
- 1.3.1. Basic Blocks
- 1.3.2. Basic Protocols
- 1.3.3. Intermediate Protocols
- 1.3.4. Advanced Protocols
- 1.3.5. Exoteric Protocols

1.4. Cryptographic Techniques
- 1.4.1. Length of Passwords
- 1.4.2. Password Management
- 1.4.3. Types of Algorithms
- 1.4.4. Summary of Functions Hash
- 1.4.5. Pseudo-Random Number Generators
- 1.4.6. Use of Algorithms

1.5. Symmetric Cryptography
- 1.5.1. Block Ciphers
- 1.5.2. DES (Data Encryption Standard)
- 1.5.3. RC4 Algorithm
- 1.5.4. AES (Advanced Encryption Standard)
- 1.5.5. Combination of Block Ciphers
- 1.5.6. Password Derivation

1.6. Asymmetric Cryptography
- 1.6.1. Diffie-Hellman
- 1.6.2. DSA (Digital Signature Algorithm)
- 1.6.3. RSA (Rivest, Shamir and Adleman)
- 1.6.4. Elliptic Curve
- 1.6.5. Asymmetric Cryptography Types

1.7. Digital Certificates
- 1.7.1. Digital Signature
- 1.7.2. X509 Certificates
- 1.7.3. Public Key Infrastructure (PKI)

1.8. Implementations
- 1.8.1. Kerberos
- 1.8.2. IBM CCA
- 1.8.3. Pretty Good Privacy (PGP)
- 1.8.4. ISO Authentication Framework
- 1.8.5. SSL and TLS
- 1.8.6. Europay, MasterCard, and Visa (EMV)
- 1.8.7. Mobile Telephony Protocols
- 1.8.8. Blockchain.

1.9. Steganography
- 1.9.1. Steganography
- 1.9.2. Stegoanalysis
- 1.9.3. Applications and Uses

1.10. Quantum Cryptography
- 1.10.1. Quantum Algorithms
- 1.10.2. Algorithm Protection Against Quantum Computing
- 1.10.3. Quantum Key Distribution

Module 2. Security in Cloud Environments

2.1. Security in Cloud Computing Environments
- 2.1.1. Security in Cloud Computing Environments
- 2.1.2. Security in Cloud Computing Security Threats and Risks
- 2.1.3. Security in Cloud Computing Key Security Aspects

2.2. Types of Cloud Infrastructure
- 2.2.1. Public
- 2.2.2. Private
- 2.2.3. Hybrid

2.3. Shared Management Model
- 2.3.1. Security Elements Managed by Supplier
- 2.3.2. Elements Managed by the Client
- 2.3.3. Definition of the Security Strategy

2.4. Prevention Mechanisms
- 2.4.1. Authentication Management Systems
- 2.4.2. Authorization Management System: Access Policies
- 2.4.3. Key Management Systems

2.5. Securing Systems
- 2.5.1. Securing Storage Systems
- 2.5.2. Protection of Database Systems
- 2.5.3. Securing Data in Transit

2.6. Infrastructure Protection
- 2.6.1. Secure Network Design and Implementation
- 2.6.2. Security in Computing Resources
- 2.6.3. Tools and Resources to Protect the Infrastructure

2.7. Detection of Threats and Attacks
- 2.7.1. Auditing, Logging and Monitoring Systems
- 2.7.2. Event and Alarm Systems
- 2.7.3. SIEM Systems

2.8. Incident Response
- 2.8.1. Incident Response Plan
- 2.8.2. Business Continuity
- 2.8.3. Forensic Analysis and Remediation of Incidents of the Same Nature.

2.9. Security in Public Clouds
- 2.9.1. AWS (Amazon Web Services)
- 2.9.2. Microsoft Azure
- 2.9.3. Google GCP
- 2.9.4. Oracle Cloud

2.10. Regulations and Compliance
- 2.10.1. Compliance with Safety Regulations
- 2.10.2. Risk Management
- 2.10.3. People and Process in the Organizations

Module 3. Security in IoT Device Communications

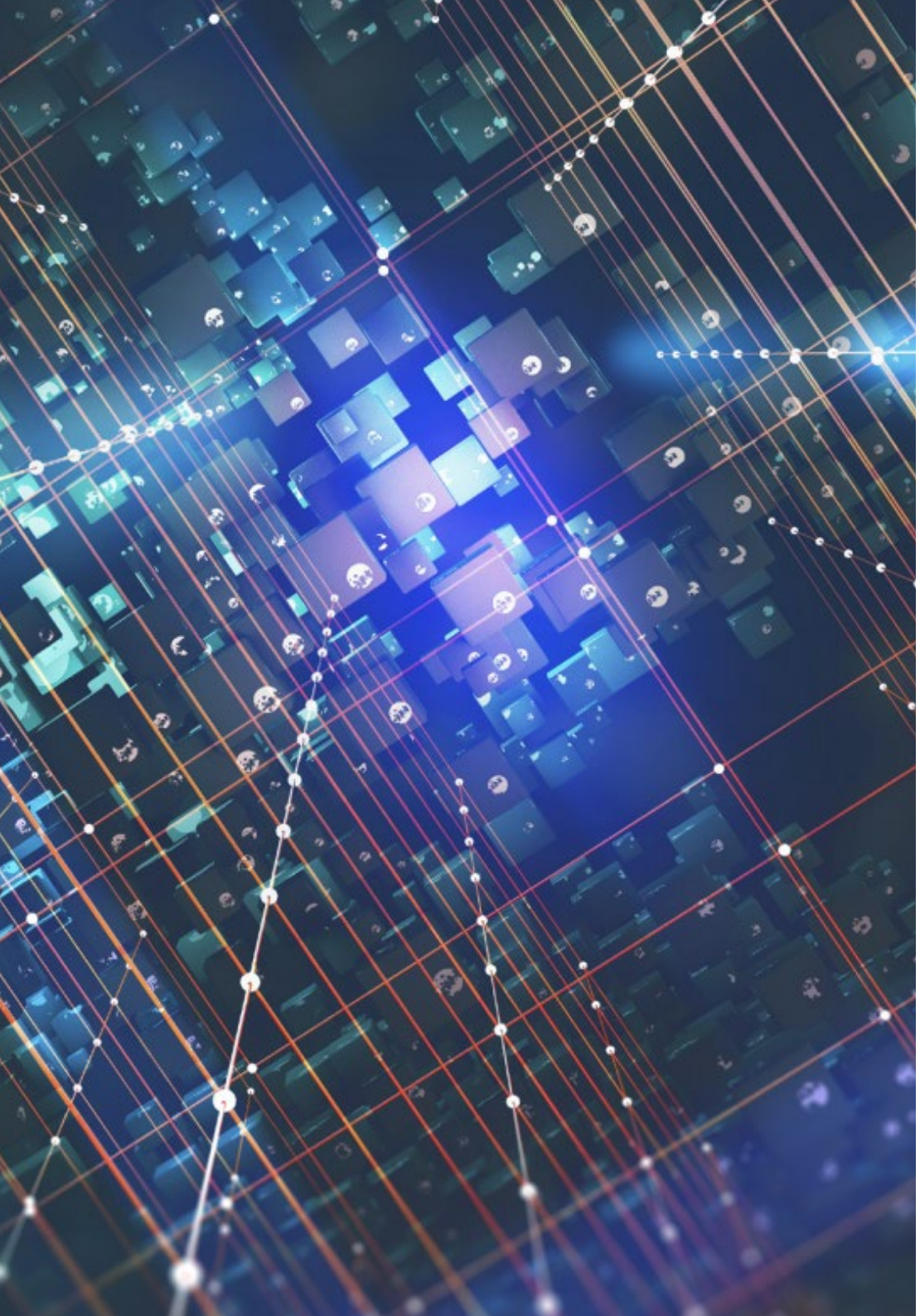
3.1. From Telemetry to IoT
- 3.1.1. Telemetry
- 3.1.2. M2M Connectivity
- 3.1. 3 Democratization of Telemetry

3.2. IoT Reference Models
- 3.2.1. IoT Reference Models
- 3.2.2. IoT Simplified Architecture

3.3. IoT Security Vulnerabilities
- 3.3.1. IoT Devices
- 3.3.2. IoT Devices Usage Case Studies
- 3.3.3. IoT Devices Vulnerabilities

3.4. Connectivity to IoT
- 3.4.1. PAN, LAN, WAN Networks
- 3.4.2. Non IoT Wireless Technologies
- 3.4.3. LPWAN Wireless Technologies

3.5. LPWAN Technologies
- 3.5.1. The Iron Triangle of LPWAN Networks
- 3.5.2. Free Frequency Bands vs. Licensed Bands
- 3.5.3. LPWAN Technology Options



3.6. LoRaWAN Technology
- 3.6.1. LoRaWAN Technology
- 3.6.2. LoRaWAN Use Cases Ecosystem
- 3.6.3. Security in LoRaWAN

3.7. Sigfox Technology
- 3.7.1. Sigfox Technology
- 3.7.2. Sigfox Use Cases Ecosystem
- 3.7.3. Security in Sigfox

3.8. IoT Cellular Technology
- 3.8.1. IoT Cellular Technology (NB-IoT and LTE-M)
- 3.8.2. Cellular IoT Use Cases Ecosystem
- 3.8.3. IoT Cellular Security

3.9. WiSUN Technology
- 3.9.1. WiSUN Technology
- 3.9.2. WiSUN Use Cases Ecosystem
- 3.9.3. Security in WiSUN

3.10. Other IoT Technologies
- 3.10.1. Other IoT Technologies
- 3.10.2. Use Cases and Ecosystem of Other IoT Technologies
- 3.10.3. Security in Other IoT Technologies

The best faculty will bring you up to date on emerging technology security with the latest content"

05

Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.

Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our 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"

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.

The student will learn to solve complex situations in real business environments through collaborative activities and real cases.

A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

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

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, students will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

Relearning Methodology

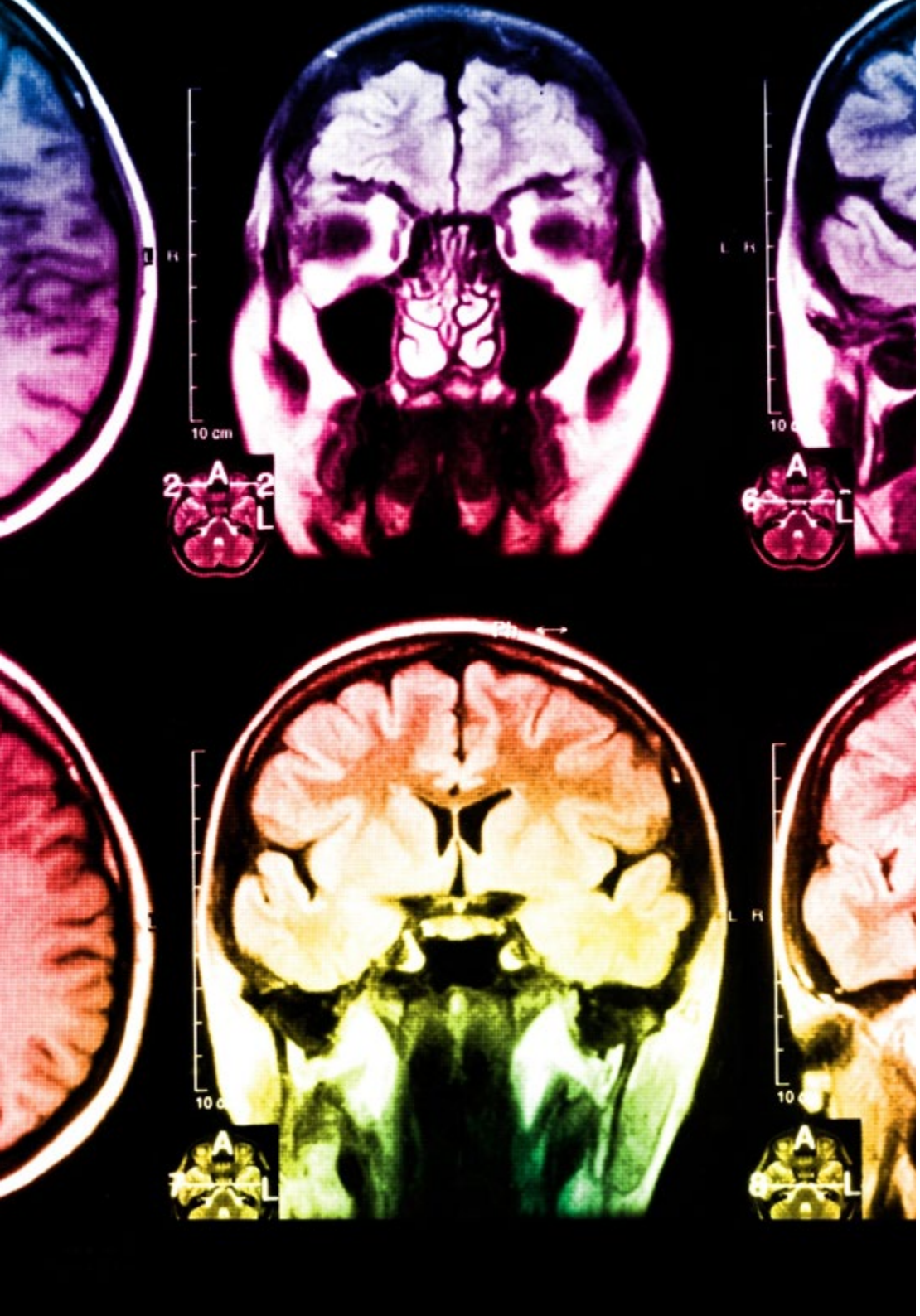
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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

In 2019, we obtained the best learning results of all online universities in the world.

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.



In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically. This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

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

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.

This program offers the best educational material, prepared with professionals in mind:

Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then adapted in audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high-quality pieces in each and every one of the materials that are made available to the student.

Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

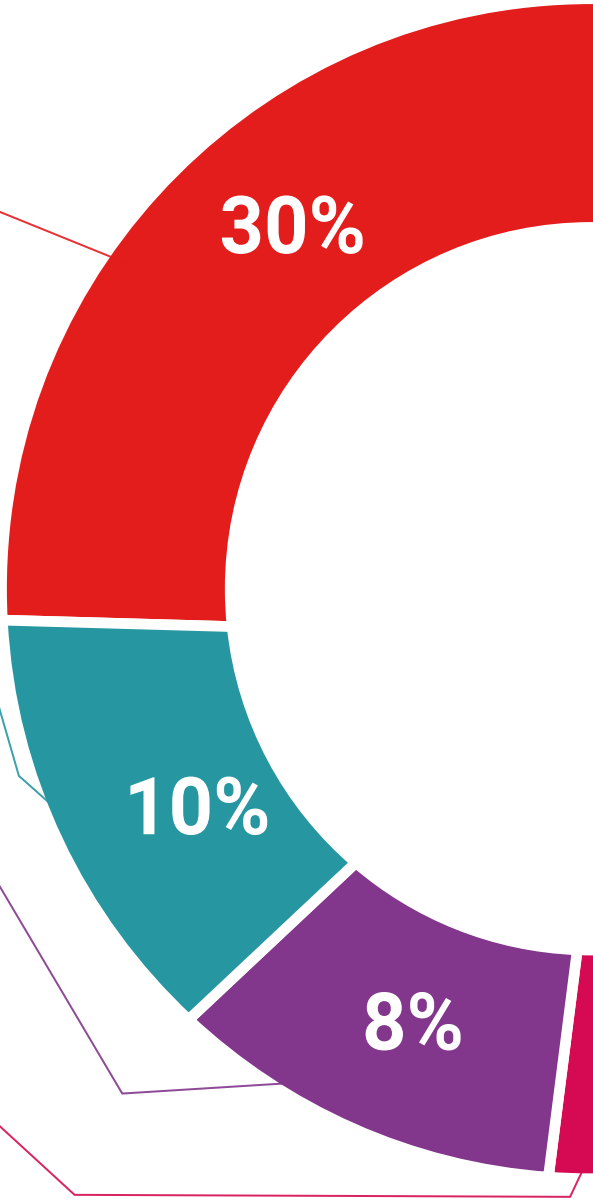
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

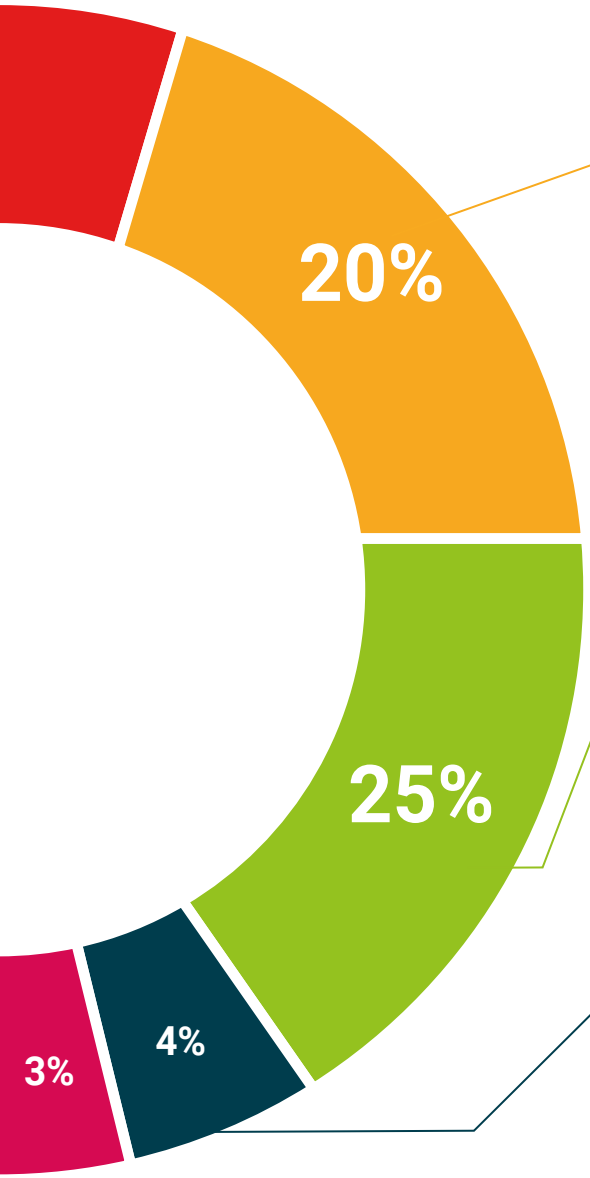
Practising Skills and Abilities

They will carry out activities to develop specific competencies and skills in each thematic area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.

Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.

Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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

Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.

06

Certificate

The Postgraduate Diploma in Cybersecurity in Technologies Emerging guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Global University.

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

This program will allow you to obtain your **Postgraduate Diploma in Emerging Technologies** 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 Cybersecurity in Emerging Technologies**

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Duration: **6 months**

Accreditation: **18 ECTS**

tech global university

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

Postgraduate Diploma in Emerging Technologies

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

Dr. Pedro Navarro Illana
Rector

Unique TECH Code: AFWORD23S techtitute.com/certificates

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

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