



### Postgraduate Certificate

Reverse Engineering in Cybersecurity

» Modality: online

» Duration: 6 weeks

» Certificate: TECH Global University

» Credits: 6 ECTS

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/us/school-of-business/postgraduate-certificate/reverse-engineering-cybersecurity

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Certificate

# 01 **Welcome**

Applying cybersecurity techniques to prevent malicious software requires having extensive and detailed knowledge of how the applications work, from communication protocols to algorithms, so as to identify the potential route of a computer attack. Reverse engineering techniques, such as static code analysis and dynamic analysis for decrypting communication protocols, lead to a sufficient understanding of the protocol involved in developing proprietary programs. Moreover, there are also other useful techniques thatfacilitate the detection of potential computer system vulnerabilities, which is why TECH has designed this program to teach business professionals how to act to detect and solve them, thus ensure secure computer use.









### tech 08 | Why Study at TECH?

### At TECH Global University



#### **Innovation**

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

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



### The Highest Standards

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

95%

of TECH students successfully complete their studies



### **Networking**

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

100,000+

200+

executives trained 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 studies in the academic community"

### 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 method (a postgraduate learning methodology with the highest international rating) with the Case Study. A complex balance between tradition and state-of-the-art, within the context of the most demanding academic itinerary.



### **Economy of Scale**

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





### tech 12 | Why Our Program?

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



### A significant career boost

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

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



# Develop a strategic and global vision of companies

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

Our global vision of companies will improve your strategic vision.



### 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.



### 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 areas 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.



### Be part of an exclusive community

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

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





### tech 16 | Objectives

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

The Postgraduate Certificate in Reverse Engineering in Cybersecurity qualifies students to:



Analyz reverse engineering and its different techniques



Apply reverse engineering to cybersecurity environments



Examine the different architectures and how they affect reverse engineering





Determine under what conditions to use different reverse engineering techniques



Analyze the phases of a compiler



Examine x86 processor architecture and ARM processor architecture



Apply Sandboxing in different environments



09

Develop different malware analysis techniques

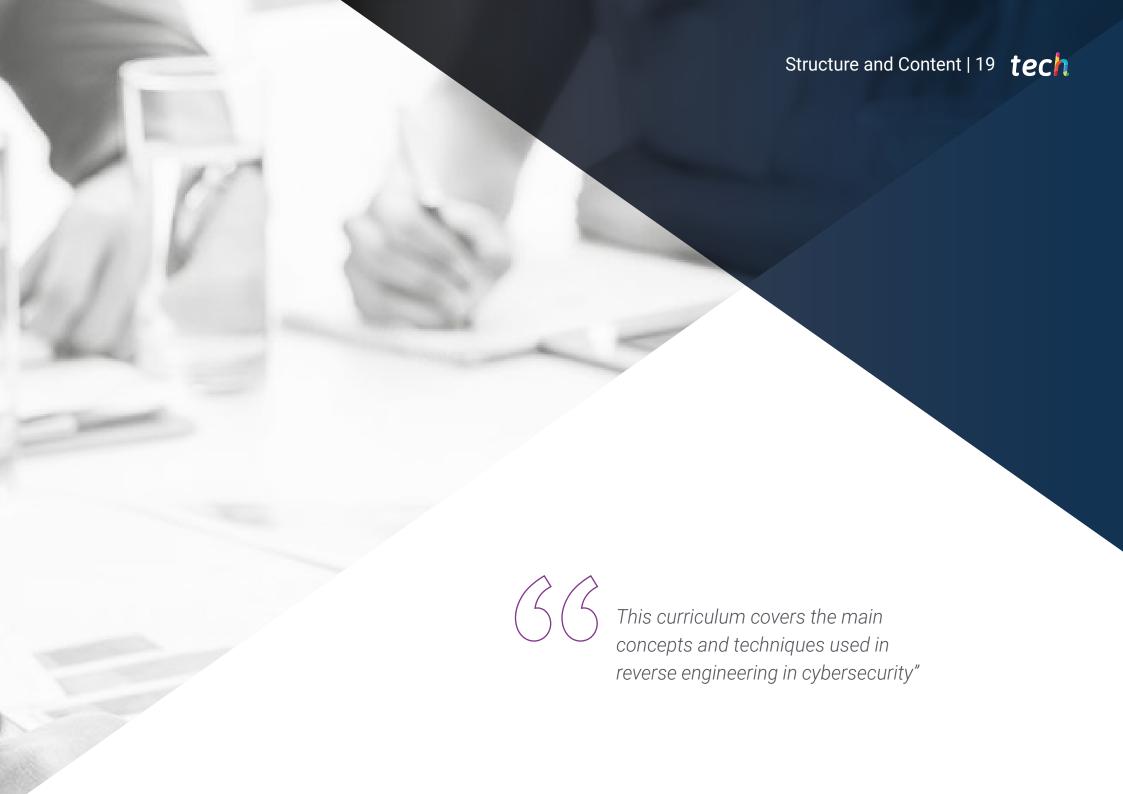


Determine the various types of analysis



Establish the tools used in malware analysis





### tech 20 | Structure and Content

### **Syllabus**

The Postgraduate Certificate in Reverse Engineering in Cybersecurity is an intensive program that prepares students to face challenges and business decisions in computer security. Its content is designed to promote the development of managerial skills that enable more rigorous decision-making in uncertain environments.

Throughout 150 hours of study, you will analyze a multitude of practical cases through individual work, which will allow you to acquire the necessary skills to develop successfully in your daily practice. It is, therefore, an authentic immersion in real business situations.

This program deals with the different areas of a company in depth, and it is designed for managers to understand cybersecurity from a strategic, international and innovative perspective.

A study plan designed especially for students, focused on their professional development, which prepares them to achieve excellence in the field of information security management and administration. A program that understands your needs and those of your company through innovative content based on the latest trends, and supported by the best educational methodology and an exceptional faculty, which will provide you with the competencies to solve critical situations in a creative and efficient way.

It is a program which is carried out in six weeks and is divided into one module:

Module 1.

**Reverse Engineering** 



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

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

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

### tech 22 | Structure and Content

| Module 1. Reverse Engineering   |   |   |   |
|---|---|---|---|
| <ul><li>1.1. Compilers</li><li>1.1.1. Types of Codes</li><li>1.1.2. Phases of a Compiler</li><li>1.1.3. Table of Symbols</li><li>1.1.4. Error Manager</li><li>1.1.5. GCC Compiler</li></ul> | <ul> <li>1.2. Types of Analysis in Compilers</li> <li>1.2.1. Lexical Analysis <ul> <li>1.2.1.1. Terminology.</li> <li>1.2.1.2. Lexical Components</li> <li>1.2.1.3. LEX Lexical Analyzer</li> </ul> </li> <li>1.2.2. Parsing <ul> <li>1.2.2.1. Context-free Grammars</li> <li>1.2.2.2. Types of Parsing</li> <li>1.2.2.2.1. Top-down Analysis</li> <li>1.2.2.2.2. Bottom-up Analysis</li> </ul> </li> </ul> | 1.2.2.3. Syntactic Trees and Derivations 1.2.2.4. Types of Parsers 1.2.2.4.1. LR (Left To Right) Analyzers 1.2.2.4.2. LALR Analyzers 1.2.3. Semantic Analysis 1.2.3.1. Attribute Grammars 1.2.3.2. S-attributes 1.2.3.3. L-attributes | <ul> <li>1.3. Data Structures in Assembler</li> <li>1.3.1. Variables</li> <li>1.3.2. Arrays</li> <li>1.3.3. Pointers</li> <li>1.3.4. Structures</li> <li>1.3.5. Objects</li> </ul>                              |
| 1.4. Assembler Code Structures 1.4.1. Selection Structures 1.4.1.1. If, else if, Else 1.4.1.2. Switch 1.4.2. Iteration Structures   | 1.4.2.1. <i>For</i><br>1.4.2.2. While<br>1.4.2.3. Break Use<br>1.4.3. Functions   | <ul><li>1.5. x86 Hardware Architecture</li><li>1.5.1. x86 Processor Architecture</li><li>1.5.2. x86 Data Structures</li><li>1.5.3. x86 Code Structures</li></ul>  | <ul><li>1.6. ARM Hardware Architecture</li><li>1.6.1. ARM Processor Architecture</li><li>1.6.2. ARM Data Structures</li><li>1.6.3. ARM Code Structures</li></ul>  |
| <ul><li>1.7. Static Code Analysis</li><li>1.7.1. Disassemblers</li><li>1.7.2. IDA</li><li>1.7.3. Code Rebuilders</li></ul>  | <ul> <li>1.8. Dynamic Code Analysis</li> <li>1.8.1. Behavioral Analysis <ul> <li>1.8.1.1. Communication</li> <li>1.8.1.2. Monitoring</li> </ul> </li> <li>1.8.2. Linux Code Debuggers</li> <li>1.8.3. Windows Code Debuggers</li> </ul>   | 1.9. Sandbox  1.9.1. Sandbox Architecture 1.9.2. Sandbox Evasion 1.9.3. Detection Techniques 1.9.4. Avoidance Techniques 1.9.5. Countermeasures 1.9.6. Sandbox on Linux 1.9.7. Sandbox on Windows 1.9.8. Sandbox on MacOS             | 1.10. Malware Analysis  1.10.1. Malware Analysis Methods 1.10.2. Malware Obfuscation Techniques 1.10.2.1. Executable Obfuscation 1.10.2.2. Restriction of Execution Environments 1.10.3. Malware Analysis Tools |







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 26 | 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 28 | 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 | 29 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.



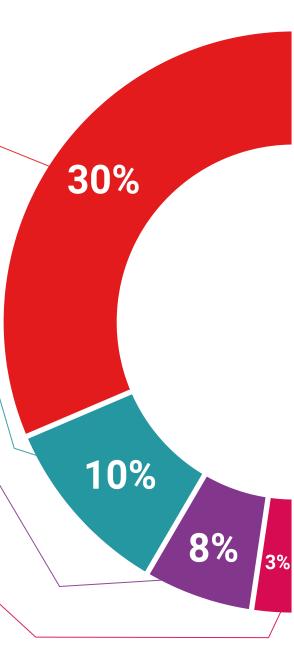
### **Management Skills Exercises**

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.

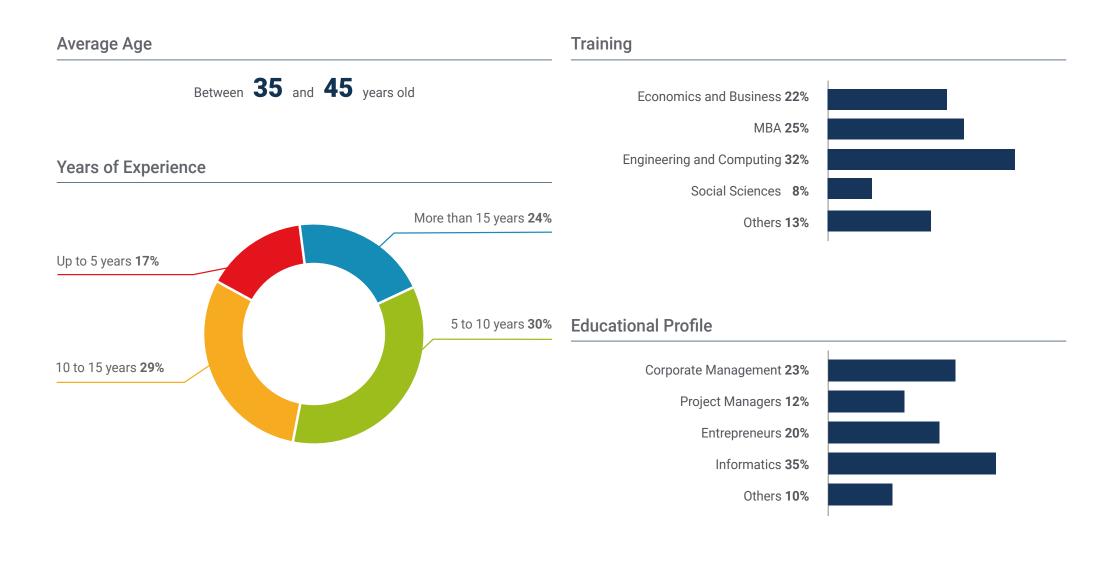


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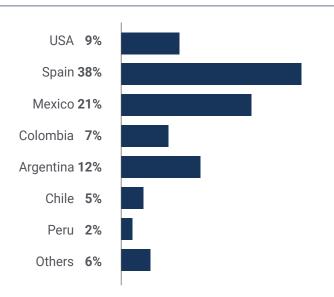




### tech 34 | Our Students' Profiles



### **Geographical Distribution**





## Jaime Díaz

#### **Chief Revenue Officer**

"Thanks to this TECH program, I was able to learn, first hand, the main reverse engineering tools that I can apply to cybersecurity, which has allowed me to acquire a deeper understanding of the field, which has boosted my confident to solve any type of computer vulnerability. Without a doubt, a program that I would highly recommend to all those who wish to specialize in this field"





#### **International Guest Director**

Dr. Frederic Lemieux is internationally recognized as an innovative expert and inspirational leader in the fields of Intelligence, National Security, Internal security, Cybersecurity and Disruptive Technologies. His constant dedication and relevant contributions in Research and Education position him as a key figure in the promotion of security and the understanding of today's emerging technologies. During his professional career, he has conceptualized and directed cutting-edge academic programs at various renowned institutions, such as the University of Montreal, George Washington University and Georgetown University.

Throughout his extensive background, he has published multiple books of great relevance, all related to **criminal intelligence**, **policing**, **cyber threats and international security**. He has also contributed significantly to the field of Cybersecurity with the publication of numerous articles in academic journals, which examine crime control during major disasters, counter-terrorism, intelligence agencies and police cooperation. In addition, he has been a panelist and keynote speaker at various national and international conferences, establishing himself as a reference in the academic and professional arena.

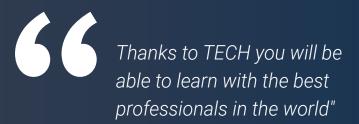
Dr. Lemieux has held editorial and evaluative roles in different academic, private and governmental organizations, reflecting his influence and commitment to excellence in his field of expertise.

As such, his prestigious academic career has led him to serve as Professor of Practice and Faculty Director of the MPS programs in Applied Intelligence, Cybersecurity Risk Management, Technology Management and Information Technology Management at Georgetown University.



# Dr Lemieux. Frederic

- Director of the Master's Program in Information Technology Management at Georgetown University
- Director of the Master in Technology Management at Georgetown University
- Director of the Master in Cybersecurity Risk Management at Georgetown University
- Director of the Master's Program in Applied Intelligence at Georgetown University
- Professor of Internship at Georgetown University
- PhD in Criminology from the School of Criminology, University of Montreal
- B.A. in Sociology, Minor Degree in Psychology, University of Laval, France
- Member of New Program Roundtable Committee, by Georgetown University

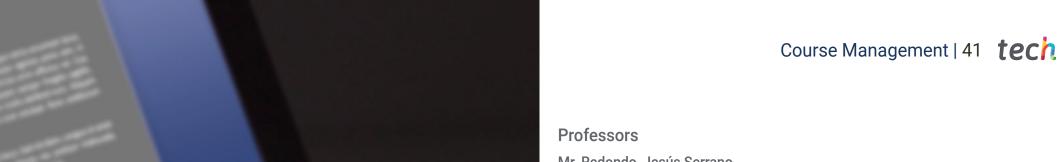


#### Management



#### Ms. Fernández Sapena, Sonia

- Computer Security and Ethical Hacking Trainer National Reference Center of Getafe in Informatics and Telecommunications Madrid
- Certified E-Council Instructor Madrid
- Trainer in the following certifications: EXIN Ethical Hacking Foundation and EXIN Cyber & IT Security Foundation Madrid
- Accredited Expert Trainer, CAM; certificates of professionalism: Computer Security (IFCT0190), Voice and Data Network
  Management (IFCM0310), Departmental Network Administration (IFCT0410), Alarm Management in Telecommunications
  Networks (IFCM0410), Voice and Data Network Operator (IFCM0110), and Internet Services Administration (IFCT0509)
- External Collaborator CSO/SSA (Chief Security Officer/Senior Security Architect) University of the Balearic Islands
- IT Engineer Alcalá de Henares University. Madrid
- Master in DevOps: Docker and Kubernetes Cas-Training Madrid
- Microsoft Azure Security Techonologies E-Council Madrid



#### Mr. Redondo, Jesús Serrano

- Junior FrontEnd Developer & Junior Cybersecurity Technician
- FrontEnd Developer at Telefónica, Madrid
- FrontEnd Developer Best Pro Consulting SL, Madrid
- Telecommunications Equipment and Services Installer Grupo Zener, Castilla y León
- Telecommunications Equipment and Services Installer Lican Comunicaciones SL, Castilla y León
- Certified in Computer Security CFTIC Getafe, Madrid
- Senior Technician: Telecommunications and Computer Systems IES Trinidad Arroyo High School, Palencia
- Senior Technician: MV and LV Electrotechnical Installations IES Trinidad Arroyo High School, Palencia
- Training in reverse engineering, stenography, encryption Incibe Hacker Academy (Incibe Talents)



A stimulating journey of professional growth designed to keep you interested and motivated throughout the entire program"







# tech 44 | Impact on Your Career

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

The TECH Global University Postgraduate Certificate in Reverse Engineering in Cybersecurity is an intensive and highly valuable program aimed at improving students' professional skills in a fiercely competitive field. Undoubtedly, it is a unique opportunity to improve professionally, but also personally, as it involves effort and dedication.

Those who wish to improve themselves, achieve a positive change at a professional level and interact with the best, will find their place at TECH.

This Postgraduate Certificate program will increase the visibility of your CV.

Achieve the promotion you seek by improving your TECH training.

#### **Time of Change**



#### Type of Change



## Salary Increase

This program represents a salary increase of more than 25.22% for our students.

\$57,900

A salary increase of

25.22%

\$72,500





# tech 48 | 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 executive and opens new avenues for professional growth within the company.



## **Building agents of change**

The professional 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**

Managers will be able to work on a real project or develop new projects in the R&D or Business Development area of their company.



#### Increased competitiveness

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







# tech 52 | Certificate

This program will allow you to obtain your **Postgraduate Certificate in Reverse Engineering in Cybersecurity** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra (*official bulletin*). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: Postgraduate Certificate in Reverse Engineering in Cybersecurity

ECTS: 6

Official No of Hours: 150 h.



#### Postgraduate Certificate in Reverse Engineering in Cybersecurity

This is a program of 150 hours of duration equivalent to 6 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





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# Postgraduate Certificate

wait \_userManager.GenerateChangePhoneNumberTokenAs

Sender.SendSmsAsync(model.PhoneNumber, "Your securit

RedirectToAction(nameof(VerifyPhoneNumber), new { Phone

/Manage/EnableTwoFactorAuthentication

Reverse Engineering in Cybersecurity

