Postgraduate Certificate

Intrusion Detection and Prevention Using Generative Artificial Intelligence Models

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Postgraduate Certificate
Intrusion Detection and Prevention Using Generative Artificial Intelligence Models

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Global University**
- Accreditation: **6 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/postgraduate-certificate/intrusion-detection-prevention-using-generative-artificial-intelligence-models

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Introduction

As cyber-attacks evolve in sophistication and frequency, traditional Intrusion Detection and Prevention tools face significant limitations in addressing new evasion tactics. In this context, Artificial Intelligence and, more recently, generative models, are transforming the landscape, offering advanced solutions that improve the ability of systems to anticipate and neutralize threats. For this reason, TECH has designed a university program that prepares computer scientists to design and implement robust IDS/IPS systems, optimized with Artificial Intelligence, and provides a comprehensive perspective on the evaluation, maintenance and continuous improvement of these tools. In addition, in a 100% online format, with the most innovative didactic content, elaborated by consolidated specialists in the sector.

You will master the most advanced Intrusion Prevention techniques that will allow you to anticipate attacks and protect critical digital infrastructures in real time. And all 100% online!"

Intrusion Detection and Prevention is one of the most critical areas in modern cybersecurity. This field focuses on identifying and mitigating unauthorized access, malicious activity and other threats that compromise both the integrity and availability of IT systems. In a digital environment where attacks are becoming increasingly advanced, traditional approaches to protection are proving insufficient. This is where Generative Artificial Intelligence is transforming the way security breaches are detected and prevented.

According to the International Telecommunications Union, global cyber-attacks have increased by 38% in recent years, affecting businesses, governments and individuals alike. In addition, the World Economic Forum identified cyber threats as one of the main dangers to economic and social stability in its most recent Global Risk Report. These figures underscore the need for advanced solutions that not only respond to known attacks, but are also capable of anticipating new malicious activities.

With this idea in mind, TECH has designed this innovative Postgraduate Certificate through which computer scientists will develop advanced skills in the implementation of Intrusion Detection and Prevention systems powered with Generative Artificial Intelligence, understanding how to analyze large volumes of data, identify anomalous patterns and simulate attack scenarios to anticipate emerging threats. In addition, they will delve into the integration of tools such as Gemini in network security and performance evaluation of intelligent systems in critical environments.

In this context, TECH offers a completely online academic program, designed with total flexibility. In this way, professionals will only need a device with Internet access to consult all the teaching materials. In addition, they will benefit from the innovative Relearning methodology, based on the strategic reiteration of key concepts to facilitate a natural, effective and lasting assimilation of the contents.

The **Postgraduate Certificate in Intrusion Detection and Prevention Using Generative Artificial Intelligence Models** contains the most complete and up-to-date program on the market. The most important features include:

- The development of case studies presented by experts in Intrusion Detection and Prevention Using Generative Artificial Intelligence Models
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable for professional practice
- 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
- Content that is accessible from any fixed or portable device with an Internet connection

You will delve into the use of Generative Artificial Intelligence to implement innovative solutions that accurately detect threats"

You will benefit from the Relearning methodology, in which TECH is a pioneer, that optimizes your learning through strategic reiteration of the most relevant concepts"

You will delve into the development of intelligent systems to ensure their effectiveness and adaptability in the face of emerging cyber threats.

With this university program, you will specialize in the simulation of cyber attacks with state-of-the-art Generative Models.

The program's teaching staff includes professionals from the industry who contribute their work experience to this 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 education programmed to learn 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 during the course. For this purpose, students will be assisted by an innovative interactive video system created by renowned experts.

02

Syllabus

This university program offers a comprehensive vision of Intrusion Detection and Prevention systems, highlighting the innovative use of Generative Artificial Intelligence. Through this academic itinerary, the computer scientist will explore the fundamentals of IDS/IPS systems to their integration with advanced tools such as Gemini, applying Big Data analysis techniques, clustering and data reduction. In addition, key topics such as attack simulation and model evaluation will be addressed, preparing the professional to face the challenges of modern Cybersecurity with practical solutions.

You will build a solid foundation in Clustering, developing cutting-edge solutions for today's digital security challenges"

Module 1. Intrusion Detection and Prevention Using Generative Artificial Intelligence Models

1.1. Fundamentals of IDS/IPS Systems and the Role of Artificial Intelligence
- 1.1.1. Definition and Basic Principles of IDS and IPS Systems
- 1.1.2. Main Types and Configurations of IDS/IPS
- 1.1.3. Contribution of Artificial Intelligence in the Evolution of Detection and Prevention Systems

1.2. Use of Gemini for Network Anomaly Detection
- 1.2.1. Concepts and Types of Anomalies in Network Traffic
- 1.2.2. Gemini's Features for Network Data Analysis
- 1.2.3. Benefits of Anomaly Detection in Intrusion Prevention

1.3. Gemini and the Identification of Intrusion Patterns
- 1.3.1. Principles of Intrusion Pattern Identification and Classification
- 1.3.2. AI Techniques Applied in the Detection of Threat Patterns
- 1.3.3. Types of Patterns and Anomalous Behavior in Network Security

1.4. Application of Generative Models in Attack Simulation
- 1.4.1. Fundamentals of Generative Models in Artificial Intelligence
- 1.4.2. Use of Generative Models to Recreate Attack Scenarios
- 1.4.3. Advantages and Limitations of Attack Simulation Using Generative Artificial Intelligence

1.5. Clustering and Event Classification Using Artificial Intelligence
- 1.5.1. Fundamentals of Clustering and Classification in Intrusion Detection
- 1.5.2. Common Clustering Algorithms Applied in Cybersecurity
- 1.5.3. Role of Artificial Intelligence in Improving Event Classification Methods

1.6. Gemini in the Generation of Behavioral Profiles
- 1.6.1. User and Device Profiling Concepts
- 1.6.2. Application of Generative Models in the Creation of Profiles
- 1.6.3. Benefits of Behavioral Profiling in Threat Detection

1.7. Big Data Analysis for Intrusion Prevention
- 1.7.1. Importance of Big Data in Detecting Security Patterns
- 1.7.2. Methods for Processing Large Volumes of Data in Cybersecurity
- 1.7.3. AI Applications in Analysis and Prevention Based on Big Data

1.8. Data Reduction and Selection of Relevant Features with Artificial Intelligence
  1.8.1. Principles of Dimensionality Reduction in Large Data Volumes
  1.8.2. Feature Selection to Improve the Efficiency of Artificial Intelligence Analysis
  1.8.3. Data Reduction Techniques Applied in Cybersecurity
1.9. Evaluation of Artificial Intelligence Models in Intrusion Detection
  1.9.1. Evaluation Criteria of Artificial Intelligence Models in Cybersecurity
  1.9.2. Performance and Accuracy Indicators of the Models
  1.9.3. Importance of Constant Validation and Evaluation in Artificial Intelligence
1.10. Implementation of an Intrusion Detection System Powered by Generative Artificial Intelligence
  1.10.1. Basic Concepts of Intrusion Detection System Implementation
  1.10.2. Integration of Generative Artificial Intelligence in IDS/IPS Systems
  1.10.3. Key Aspects for the Configuration and Maintenance of Artificial Intelligence-Based Systems

You will apply tools such as Gemini for Network Analysis and Pattern Identification to achieve optimal results in Intrusion Prevention"

03

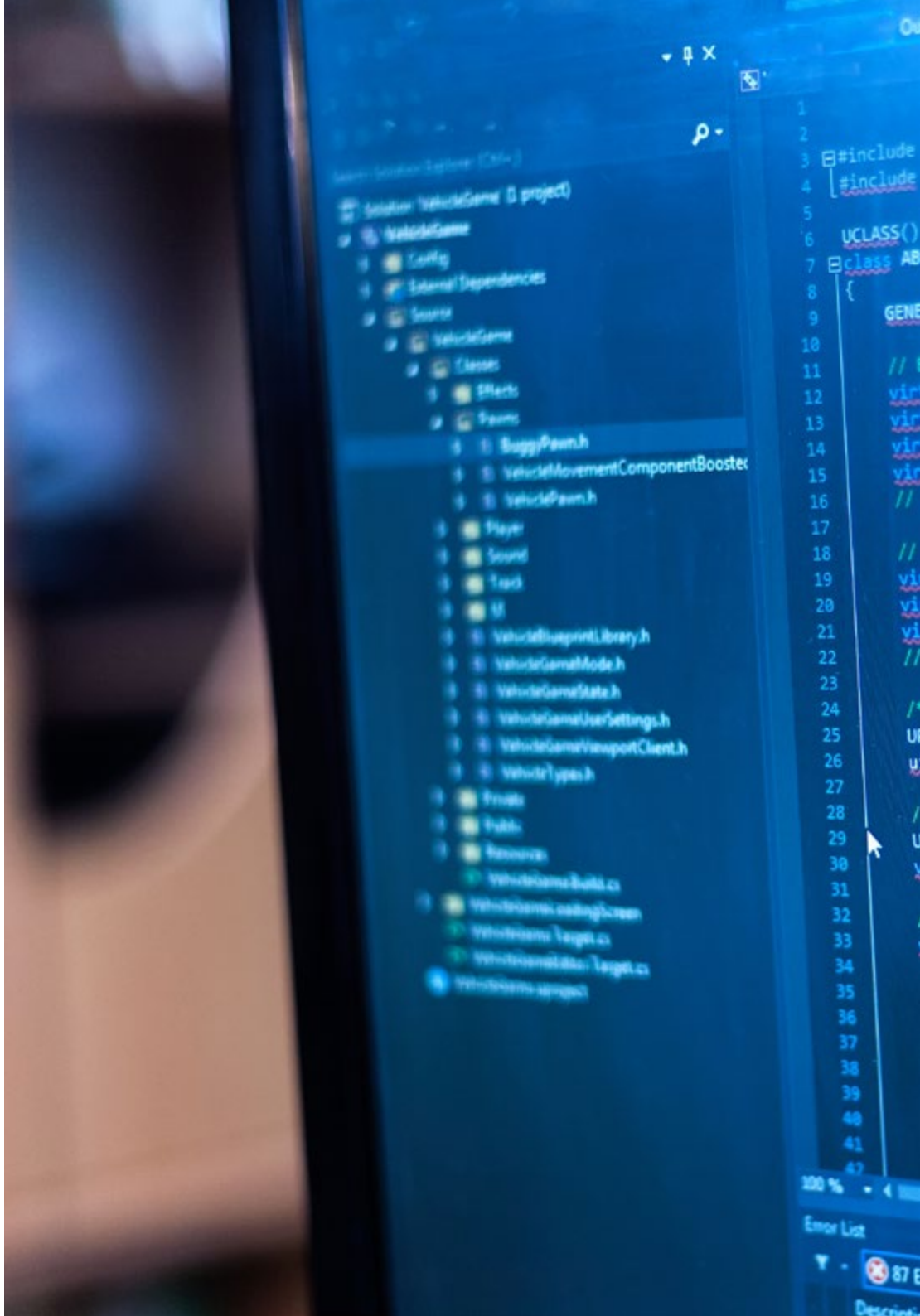
Teaching Objectives

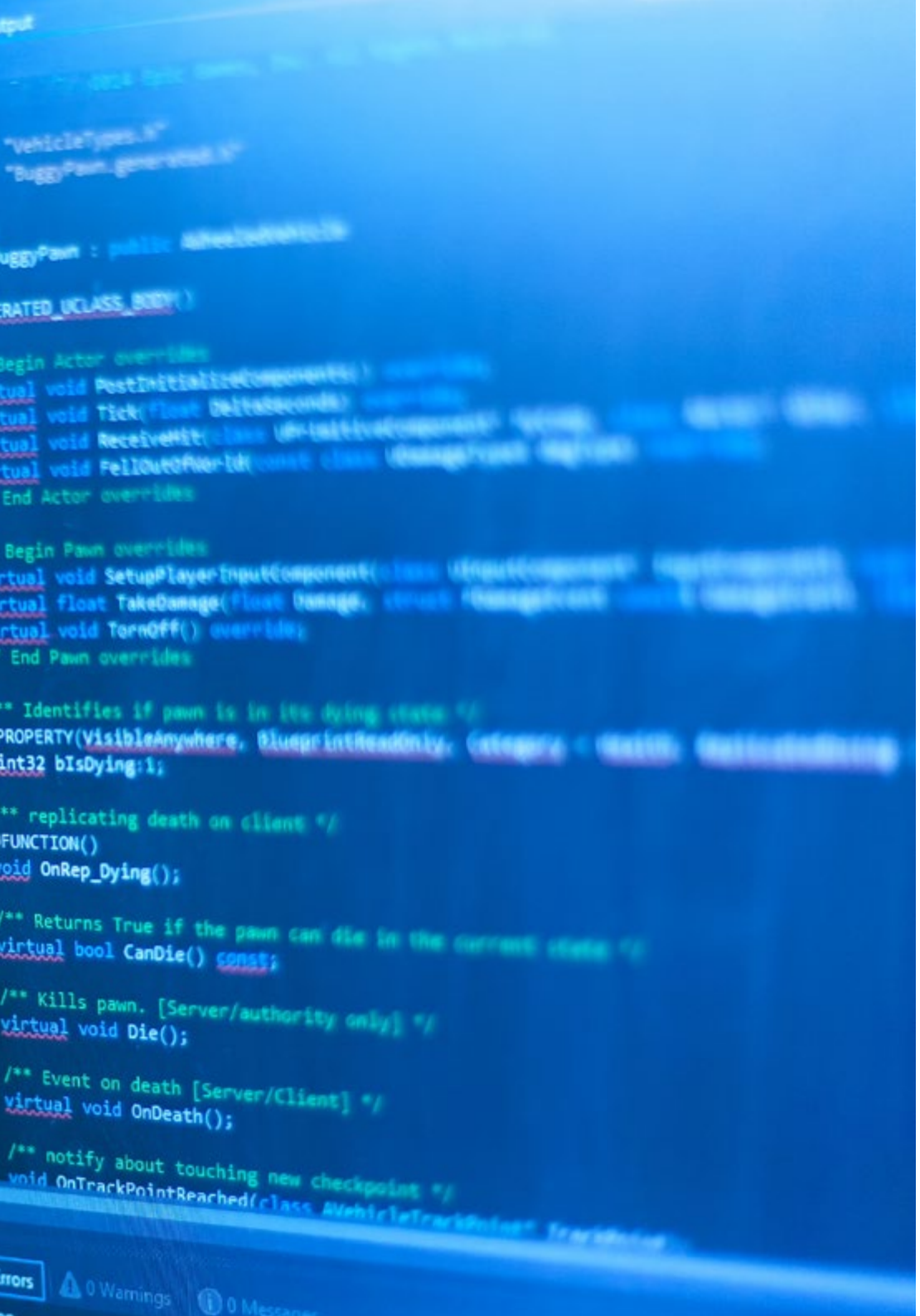
This Postgraduate Certificate provides professionals with the necessary competencies to implement advanced Intrusion Detection and Prevention solutions using Generative Artificial Intelligence. Through a practical and specialized approach, you will acquire skills in data analysis, anomalous pattern identification, threat simulation and model evaluation, preparing you to face the challenges of Cybersecurity with innovative tools and strategies.

You will develop key skills in Big Data management and Dimensionality Reduction, optimizing security processes in complex environments"

General Objectives

- Understand the theoretical and practical fundamentals of intrusion detection and prevention systems in digital environments
- Explore the role of Generative Artificial Intelligence in identifying threats and simulating attack scenarios
- Analyze large volumes of data to detect anomalies and suspicious behaviors in complex networks
- Apply advanced clustering and classification techniques to improve accuracy in detecting security events
- Implement tools such as Gemini for pattern analysis and behavioral profiling in network environments
- Integrate dimensionality reduction and feature selection techniques to optimize data processing efficiency
- Evaluate and validate Artificial Intelligence models in Cybersecurity systems, guaranteeing their adaptability to new threats
- Design innovative strategies for the implementation of intrusion detection systems based on generative Artificial Intelligence





Specific Objectives

- Master anomaly and intrusion pattern detection techniques with tools such as Gemini
- Apply generative models to simulate cyber-attacks and improve intrusion prevention
- Implement advanced IDS/IPS systems optimized with Artificial Intelligence, developing behavioral profiles and analyzing Big Data in real-time
- Design integrated security architectures with Artificial Intelligence for the protection of multi-user environments and distributed systems
- Use generative models to anticipate targeted attacks and elaborate countermeasures in real time
- Integrate predictive analytics into detection systems for dynamic management of emerging threats

You will lead Advanced Cybersecurity projects, managing IDS/IPS systems with solutions based on Generative Artificial Intelligence"

04

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 quality of teaching, quality of materials, course structure and objectives is excellent. Not surprisingly, the institution became the best rated university by its students on the Global Score review platform, 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.

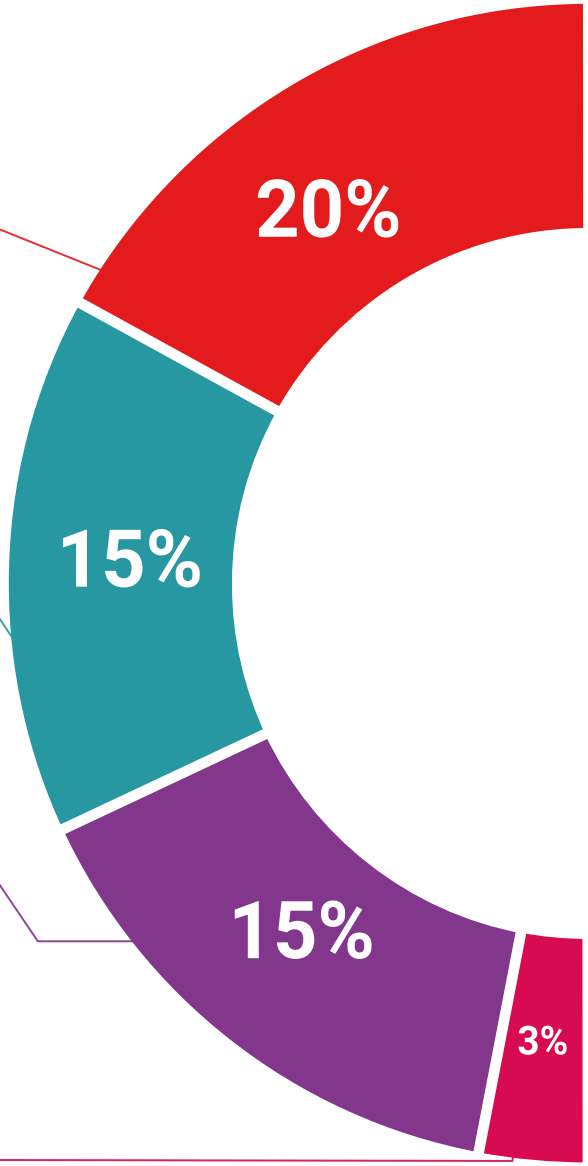
Interactive Summaries

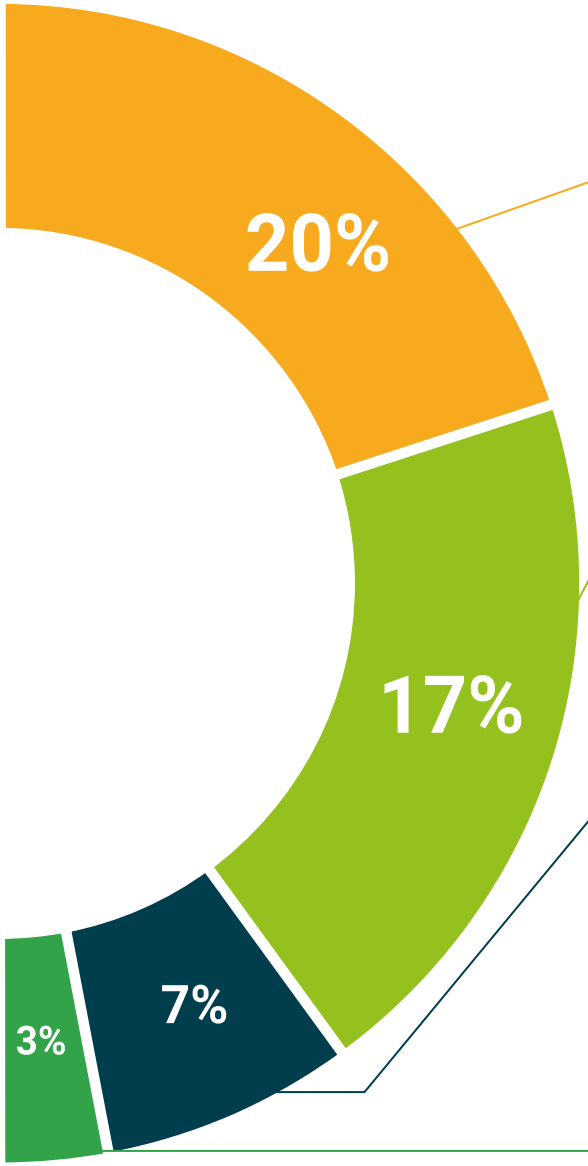
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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.

05

Teaching Staff

The teaching team of this university program is made up of recognized experts in Cybersecurity, Artificial Intelligence and Data Analytics, with extensive experience in the design and implementation of advanced solutions for the protection of digital infrastructures. Through their practical knowledge and innovative approach, they guarantee a high quality academic itinerary, adapted to the latest industry requirements and oriented to the development of key competencies to face the current challenges in the effective management of cyber threats.

You will have access to specialized readings and interactive videos developed by industry leaders, with a strategic vision that will prepare you for the most demanding challenges in Cybersecurity"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shepherds GmbH
- Consultant and Strategic Business Advisor at Alliance Medical
- Director of Design and Development at DocPath
- Doctorate in Psychology from the University of Castilla La Mancha
- Doctorate in Economics, Business and Finance from the Camilo José Cela University
- Doctorate in Psychology from University of Castilla La Mancha
- Master's Degree in Executive MBA from the Isabel I University
- Master's Degree in Sales and Marketing Management from the Isabel I University
- Expert Master's Degree in Big Data by Hadoop Training
- Master's Degree in Advanced Information Technologies from the University of Castilla La Mancha
- Member of: SMILE Research Group

Professors

Mr. Del Rey Sánchez, Alejandro

- In Charge of Implementing Programs to Improve Tactical Emergency Care
- Degree in Industrial Organization Engineering
- Certification in Big Data and Business Analytics
- Certification in Microsoft Excel Advanced, VBA, KPI and DAX
- Certification in CIS Telecommunication and Information Systems

All teachers in this program accumulate extensive experience, offering you an innovative perspective on the main advances in this field of study"

06

Certificate

The Postgraduate Certificate in Intrusion Detection and Prevention Using Generative Artificial Intelligence Models 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 **Postgraduate Certificate in Intrusion Detection and Prevention Using Generative Artificial Intelligence Models** endorsed by **TECH Global University**, the world's largest online university.

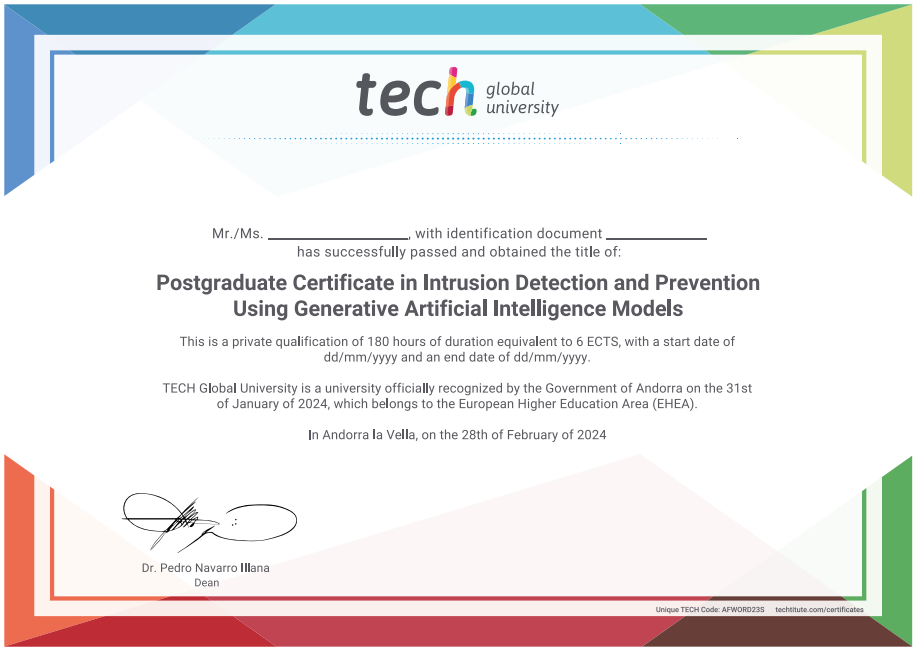
This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Intrusion Detection and Prevention Using Generative Artificial Intelligence Models**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**


tech global university

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

Postgraduate Certificate in Intrusion Detection and Prevention Using Generative Artificial Intelligence Models

This is a private qualification of 180 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

Dr. Pedro Navarro Illana
Dean

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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