

# Postgraduate Certificate Risk Analysis in Algorithmic Trading



## Postgraduate Certificate Risk Analysis in Algorithmic Trading

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

Website: [www.techtitude.com/us/school-of-business/postgraduate-certificate/risk-analysis-algorithmic-trading](http://www.techtitude.com/us/school-of-business/postgraduate-certificate/risk-analysis-algorithmic-trading)

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# 01

# Introduction to the Program

Financial professionals increasingly recognize the need to implement effective Risk Management in Algorithmic Trading systems. In this regard, the International Organization of Securities Commissions estimates that approximately 70% of the daily volume in stock markets is generated by algorithms, significantly increasing exposure to technical failures and market mismatches. Given this scenario, the timely identification of operational and financial risks becomes a key factor in ensuring the stability of automated strategies. To address this demand, TECH has designed this university program, providing the most relevant and up-to-date content in this field. All this, based on a 100% online, dynamic and innovative methodology.





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*Through this 100% online Postgraduate Certificate, you will develop the ability to interpret the structure of the Order Book in real time, identifying liquidity signals and imbalances in supply and demand”*

Risk Analysis in Algorithmic Trading requires mastering specific tools that allow for anticipating fluctuations and protecting capital against unforeseen events. For instance, deeply understanding the factors that influence volatility is key to designing robust strategies against extreme market conditions. In this regard, financial professionals must handle quantitative indicators that measure real-time exposure to risk. Additionally, integrating predictive models based on historical data and Machine Learning provides a competitive advantage in minimizing losses in adverse scenarios.

In this context, TECH presents an innovative Postgraduate Certificate in Risk Analysis in Algorithmic Trading. Designed by experts in quantitative finance, the syllabus will address the main methods for managing drawdown and establishing effective loss limits in automated strategies. Aligned with this, the syllabus will delve into the application of portfolio optimization models aimed at reducing risk exposure without compromising profitability. Furthermore, the educational materials will provide professionals with practical tools to evaluate key metrics and adjust asset allocation based on the risk profile. In doing so, they will develop the competencies needed to implement dynamic control systems that strengthen the resilience of their algorithms.

The program will be offered in a 100% online format, allowing financial professionals to adapt their training to their work schedules. In fact, all that is required is a device with internet access to enter the virtual campus. Additionally, the academic proposal incorporates its innovative Relearning system, ensuring the progressive and meaningful assimilation of technical content. This approach avoids traditional methods based on the mechanical memorization of formulas or models.

This **Postgraduate Certificate in Risk Analysis in Algorithmic Trading** 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 Risk Analysis in Algorithmic Trading
- ♦ 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 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 become proficient in designing and implementing risk mitigation strategies in Algorithmic Trading systems, evaluating technical, operational, and market vulnerabilities"*

“

*Thanks to the resources provided in this university program, you will be able to analyze the impact of liquidity on the behavior of financial assets”*

The faculty includes professionals from the field of Risk Analysis in Algorithmic Trading, who bring their real-world experience to this program, as well as recognized specialists from leading firms 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.

*With TECH, you will identify and evaluate factors triggering systemic risk in financial markets, developing effective strategies to mitigate the impact of crises.*

*This 100% online university qualification will allow you to study from anywhere in the world, acquiring the skills to assess and manage complex risks in Algorithmic Trading.*



02

# 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 relies on an enormous faculty of more than 6,000 professors of the highest international renown.





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*Study at the world's largest online university  
and guarantee your professional success.  
The future starts 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 Wistumba, 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.



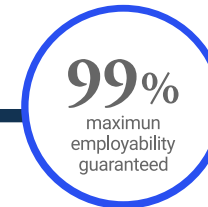
#### Google Premier Partner

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.



# 03 Syllabus

This Postgraduate Certificate in Risk Analysis in Algorithmic Trading will provide financial professionals with a detailed understanding of counterparty risk and its impact on market operations. The syllabus will cover the fundamental aspects of evaluating the solvency and reliability of brokers and counterparties in automated environments. Additionally, the academic content will offer technical criteria to comply with current regulatory requirements applicable to funds and traders, ensuring operational transparency and security. The syllabus will also delve into the mechanisms that mitigate default risk and protect the integrity of Algorithmic Trading transactions.





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*You will conduct quantitative analyses using Value at Risk (VaR) to measure and manage market risk exposure in portfolios and algorithmic strategies”*

## Module 1. Risk Analysis in Algorithmic Trading

- 1.1. The Importance of Risk Management in Trading
  - 1.1.1. Types of Risk in Financial Markets
  - 1.1.2. Importance of Risk Control
  - 1.1.3. Quantitative vs. Qualitative Approaches
- 1.2. Market Risk and Volatility
  - 1.2.1. Factors Influencing Volatility
  - 1.2.2. Calculation and Use of Value at Risk (VaR)
  - 1.2.3. Volatility Prediction Models
- 1.3. Liquidity and Implementation Risk
  - 1.3.1. Liquidity and Execution Risk
  - 1.3.2. Impact of Liquidity on Trading
  - 1.3.3. Order Book Analysis
- 1.4. Credit and Counterparty Risk
  - 1.4.1. Importance of Counterparty Risk
  - 1.4.2. Evaluating Broker Solvency
  - 1.4.3. Preventing Default Risk
- 1.5. Operational Risk in Algorithmic Trading
  - 1.5.1. Technical Failures and Execution Errors
  - 1.5.2. Risks Associated with Data and Market Feeds
  - 1.5.3. Mitigation Strategies
- 1.6. Systemic Risk and Financial Crises
  - 1.6.1. Crisis Trigger Factors
  - 1.6.2. Domino Effect in Markets
  - 1.6.3. Hedging Strategies in Crises
- 1.7. Managing Drawdown and Loss Control
  - 1.7.1. Evaluating Drawdowns in Strategies
  - 1.7.2. Loss Reduction Techniques
  - 1.7.3. Psychology of Risk and Loss Aversion



- 1.8. Diversification and Portfolio Management
  - 1.8.1. Diversification Across Strategies and Markets
  - 1.8.2. Asset Correlations
  - 1.8.3. Using Portfolio Optimization Models
- 1.9. Risk Management Tools and Software
  - 1.9.1. Specialized Platforms
  - 1.9.2. Adverse Scenario Simulation
  - 1.9.3. Evaluation of Key Metrics
- 1.10. Regulatory Framework and Compliance in Risk Management
  - 1.10.1. International Risk Regulations
  - 1.10.2. Regulatory Requirements for Funds and Traders
  - 1.10.3. Transparency and Auditing in Risk Management

“You will explore both quantitative and qualitative methods to analyze risks in Algorithmic Trading, integrating mathematical models with subjective assessments”



# 04 Teaching Objectives

This Postgraduate Certificate in Risk Analysis in Algorithmic Trading is designed to provide financial professionals with the most advanced tools to identify and manage various types of risk present in the markets. In this regard, graduates will develop the competencies necessary to anticipate, manage, and respond effectively to adverse events in highly volatile environments.





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*You will expand your ability to analyze correlations between financial assets, optimizing diversification and risk management in algorithmic portfolios”*



## General Objectives

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- Identify the main financial risks associated with the use of algorithms in trading
- Evaluate the potential impact of market events on automated strategies
- Apply quantitative methodologies to measure and control risk in algorithmic systems
- Design risk management models adapted to high-frequency operational environments
- Implement simulation tools and stress testing to validate the robustness of strategies
- Integrate risk management principles into the development and monitoring of algorithms
- Detect technical and operational vulnerabilities in algorithmic infrastructure
- Monitor regulatory compliance in relation to financial risk management
- Optimize the risk-return relationship in automated execution of trades
- Foster a critical and preventive approach to systemic and technological risks in trading





## Specific Objectives

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- ♦ Apply Order Book analysis techniques to assess liquidity and anticipate potential impacts on order execution
- ♦ Implement methodologies for evaluating and mitigating operational risk, including early detection of anomalies in market data and feeds
- ♦ Develop quantitative models for calculating Value at Risk (VaR) under different assumptions and time horizons
- ♦ Integrate strategies for managing drawdown and loss control through automated systems, ensuring capital preservation and long-term sustainability



*Manage the domino effect in financial markets, identifying systemic contagions and applying mitigation strategies to protect the stability and continuity of portfolios"*



# 05 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.





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*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.

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*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.

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*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

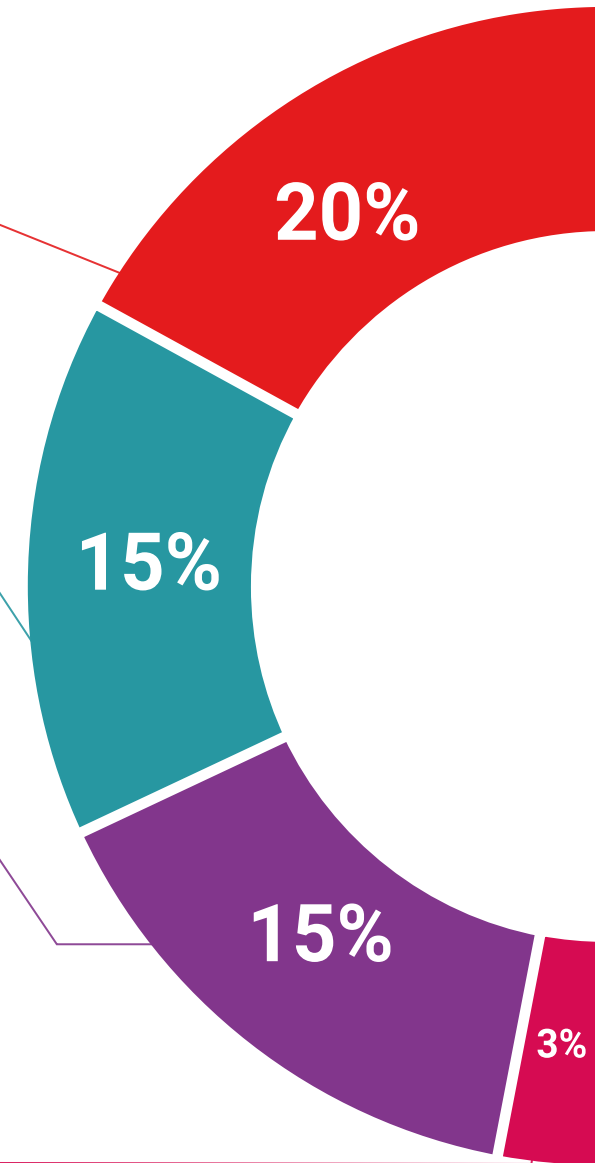
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

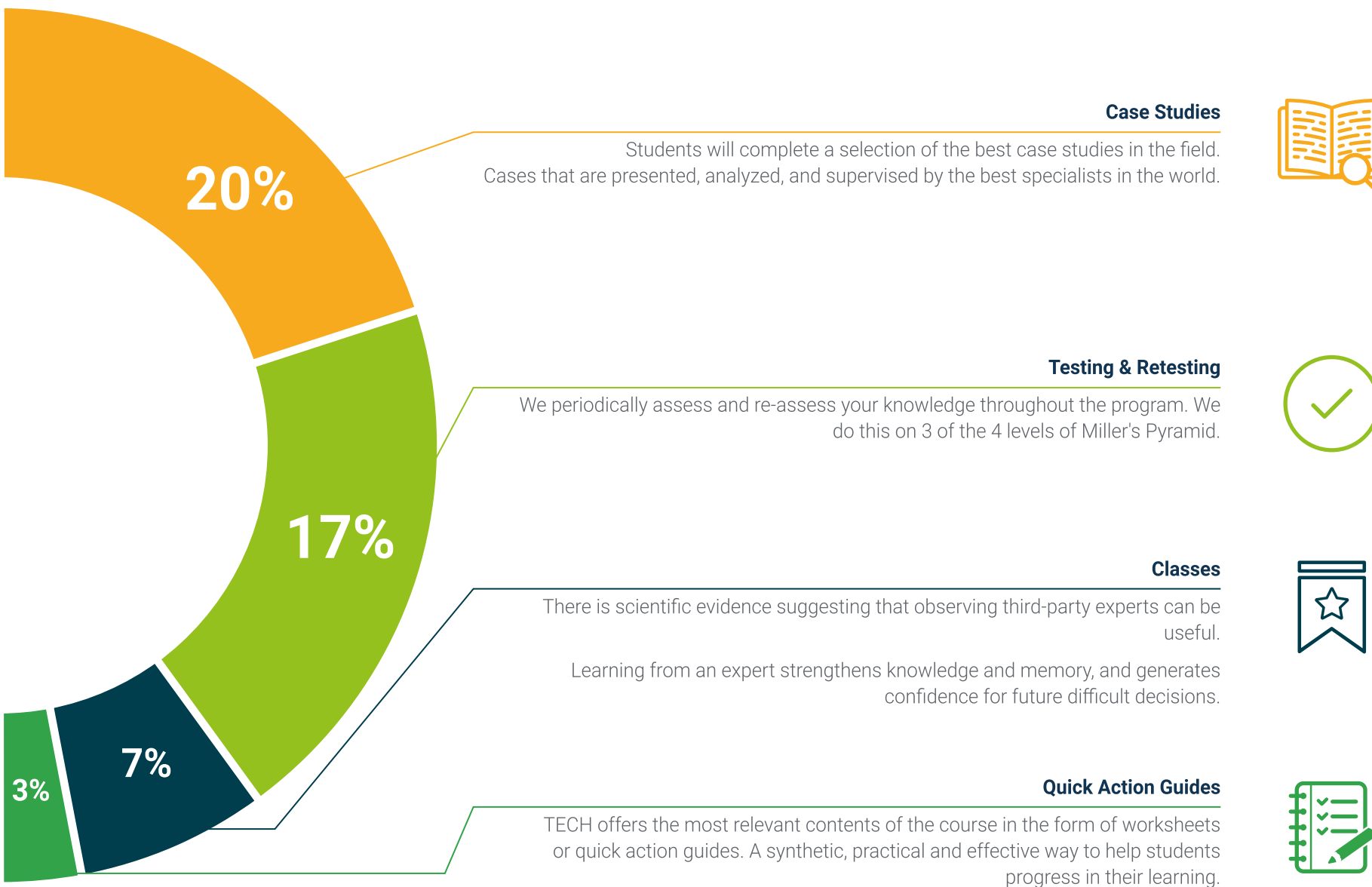
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Additional Reading

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







# 06 Teaching Staff

The teachers selected by TECH for this university program have extensive experience in risk analysis in automated markets. They have participated in the development of predictive models and operational risk mitigation strategies in Algorithmic Trading. As such, they have designed specialized content that covers everything from counterparty risk analysis to drawdown management and portfolio optimization. Thanks to this, graduates will receive comprehensive training that will enable them to implement effective solutions for risk evaluation and control in complex financial environments.



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*You will be trained by a faculty composed of experts in Risk Analysis and Algorithmic Trading, helping you develop advanced technical and strategic competencies”*

## Management



### Dr. Gómez Martínez, Raúl

- ♦ Founding Partner and CEO of Open 4 Blockchain Fintech
- ♦ Founding Partner of *InvestMood Fintech*
- ♦ Apara's CEO
- ♦ PhD in Business Economics and Finance from the University Rey Juan Carlos de Madrid
- ♦ Bachelor's Degree in Economics and Business Administration, Complutense University of Madrid
- ♦ Master's Degree in Economic Analysis and Financial Economics, Complutense University of Madrid



### Dr. Lara Bocanegra, Ana María

- ♦ Company Owner (Financial)
- ♦ Ph.D. from the University of Seville
- ♦ Trader of NYSE Stocks at World Trade Securities
- ♦ Junior Trader at Swiftrad
- ♦ Mechanical Behaviour of Materials from University of Seville
- ♦ Experimental Techniques II from University of Seville
- ♦ Materials Science from University of Seville
- ♦ Advanced Trading Stocks Techniques from University of Seville



## Teachers

### Dr. Medrano García, María Luisa

- ♦ Director of university graduate programs
- ♦ Technical advisor for public institutions
- ♦ Professor in university degrees, courses and postgraduate programs.
- ♦ Ph.D. in Senior Management from the Rey Juan Carlos University
- ♦ Degree in Business Administration from the Complutense University of Madrid
- ♦ Economic and Social Council of the Community of Madrid Research Award

### Dr. Guerra Moruno, Lucía

- ♦ Responsible for content planning and technical strategies at Scientia System S.L.U
- ♦ Ph.D. in Big Data and Quantitative Finance
- ♦ Head of Content Creation and Programming Strategies at Scientia System S.L
- ♦ Technical Consultant and Programmer at Incubadora de Traders S.L.U
- ♦ Master's Degree in Banking and Quantitative Finance
- ♦ Graduate in Physics

### Mr. Martín Moreno, David

- ♦ Specialist in Financial Management by European University Miguel de Cervantes Business School
- ♦ Master's Degree in Financial Planning and Advice from the Rey Juan Carlos University
- ♦ Bachelor's Degree in Accounting and Finance from Rey Juan Carlos University

### Mr. Segura Pacho, Felipe Marcelo

- ♦ Back Office at Indra BPO Services SLU
- ♦ Accountant at JC Segura Construcciones SA
- ♦ Specialist in Corporate Finance at the Catholic University of Salta
- ♦ Master's Degree in Financial Planning and Advice from the Rey Juan Carlos University
- ♦ Master's Degree in Business Management from the Public University of Navarra
- ♦ Collaborator of the project "Trading in Stock Exchange and Financial Markets"



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

# 07 Certificate

This Postgraduate Certificate in Risk Analysis in Algorithmic Trading guarantees students, in addition to the most rigorous and up-to-date education, access to a diploma for the Postgraduate Certificate issued by TECH Global University.



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*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 diploma for the **Postgraduate Certificate in Risk Analysis in Algorithmic Trading** 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: **Postgraduate Certificate in Risk Analysis in Algorithmic Trading**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**







## Postgraduate Certificate Risk Analysis in Algorithmic Trading

- » Modality: online
- » Duration: 6 weeks
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- » Accreditation: 6 ECTS
- » Schedule: at your own pace
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