

Postgraduate Certificate

Technical Analysis of Financial Markets with Artificial Intelligence



Postgraduate Certificate Technical Analysis of Financial Markets with Artificial Intelligence

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

Website: www.techtute.com/us/inteligencia-artificial/postgraduate-certificate/technical-analysis-financial-markets-artificial-intelligence

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01

Introduction

Technical analysis of financial markets is undergoing a significant transformation thanks to Artificial Intelligence. Indeed, the adoption of advanced algorithms and machine learning techniques allows investors to process large volumes of data in real time, identifying patterns and trends that are difficult to discern with the naked eye. Tools such as Genius Station AI and Madritia are at the forefront, using Big Data to deliver more accurate and detailed predictive analytics, facilitating informed decision making. In this context, TECH has developed a fully online program that will fit the work and personal schedules of graduates, employing the innovative learning methodology known as Relearning.



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With this 100% online Postgraduate Certificate, you will combine advanced analysis techniques with Artificial Intelligence tools to interpret complex data and make informed decisions in a dynamic financial environment”

The integration of advanced algorithms and machine learning models allows investors to process huge volumes of data in real time, identifying patterns and trends that may go unnoticed by traditional human analysis. Tools such as robo-advisors and predictive analytics software are democratizing access to sophisticated investment strategies.

This is how this Postgraduate Certificate was created, in which advanced tools, such as Plotly, Dash and Scikit-learn, will be used to create interactive visualizations that facilitate a better understanding of market dynamics. In fact, this approach will enable professionals to make more informed data-driven decisions, improving their ability to anticipate market movements and manage risks effectively.

It will also analyze how Convolutional Neural Networks (CNN) can be applied to identify complex patterns in price charts and other relevant data, which will increase the accuracy in detecting trading opportunities. In this sense, by developing predictive models based on CNNs, Artificial Intelligence will be leveraged to optimize technical analysis and make more accurate recommendations in real time.

Finally, the design and optimization of algorithmic trading strategies will be incorporated through Reinforcement Learning techniques, using TensorFlow. Therefore, experts will acquire skills in creating algorithms that not only operate in the markets, but also learn and adapt to changing market conditions to maximize profitability.

In this way, TECH has created a comprehensive, fully online program, which will only require an electronic device with an Internet connection to access all educational resources. This will eliminate inconveniences such as the need to travel to a physical location and the restriction of a specific schedule. Additionally, it will be based on the revolutionary Relearning methodology, focusing on the repetition of essential concepts to ensure a correct assimilation of the contents.

The **Postgraduate Certificate in Technical Analysis of Financial Markets with Artificial Intelligence** 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 Artificial Intelligence applied to Stock Exchanges and Financial Markets
- ♦ The graphic, schematic, and practical contents with which they are created, provide 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
- ♦ The availability of access to the contents from any fixed or portable device with an Internet connection



You will be able to identify trading opportunities and foster the implementation of efficient algorithmic strategies that will be able to adapt to market conditions. What are you waiting for to enroll”

“

You will implement innovative and effective solutions in the world of trading, acquiring a competitive edge in investment analysis and management, thanks to an extensive library of innovative multimedia resources”

The program includes in its teaching staff professionals of the sector that pour into this program the experience of their work, as well as recognized specialists from reference 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 in the field of educational coaching with extensive experience.

Don't miss this unique opportunity that only TECH offers you! You will master advanced tools, such as Plotly, Dash and Scikit-learn, to create interactive visualizations that facilitate the interpretation of financial data.

You will apply Convolutional Neural Networks (CNN) to analyze large volumes of historical and real-time data, anticipating market movements and optimizing your investment strategies.



02

Objectives

One of the main objectives of the program will be to enable graduates to visualize and optimize technical indicators through advanced tools, facilitating more informed decision making. In addition, the implementation of Convolutional Neural Networks (CNN) for pattern recognition in financial data will be deepened, improving accuracy in the identification of trading opportunities. They will also develop skills in the design and optimization of algorithmic trading strategies, using Reinforcement Learning techniques with TensorFlow.





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The objectives of this Postgraduate Certificate will focus on providing you with a comprehensive preparation that combines theory and practice in the financial and technological fields. And in just 6 weeks of training”



General Objectives

- ♦ Develop skills to apply advanced Artificial Intelligence techniques in the technical and fundamental analysis of financial markets, including the use of Machine Learning, Deep Learning and NLP
- ♦ Train students to design, implement and optimize algorithmic trading strategies, using Reinforcement Learning and Machine Learning techniques to improve efficiency and profitability in financial markets
- ♦ Equip students with the tools and knowledge necessary to develop innovative financial solutions that integrate Artificial Intelligence
- ♦ Create predictive models using Machine Learning techniques, such as LSTM and time-series models, to anticipate market movements and improve investment decision making





Specific Objectives

- Develop the ability to visualize and optimize technical indicators using tools such as Plotly, Dash and Scikit-learn, enabling more informed decision making in the technical analysis of financial markets
- Implement Convolutional Neural Networks (CNN) for pattern recognition in financial data, improving accuracy in the identification of trading opportunities
- Acquire skills in the design and optimization of algorithmic trading strategies using Reinforcement Learning techniques with TensorFlow, focused on maximizing profitability



You will position yourself competitively in the job market, as AI and data analytics skills are in high demand in today's financial sector"

03

Course Management

The professors are highly qualified professionals with extensive experience in their respective areas of expertise. As such, this interdisciplinary team is composed of experts in finance, data analysis and Artificial Intelligence, who combine theoretical knowledge with practical applications in the real world. In fact, they have a background in the financial sector, having worked in banking institutions, investment funds and financial technology companies, providing concrete examples and relevant case studies. In addition, they are involved in advanced research and innovative projects in the field of AI applied to financial markets, further enriching the learning experience.



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The pedagogical approach of the faculty will focus on transferring skills that are highly valued in the job market, preparing you to face the challenges of the contemporary financial environment”

Management



Dr. Peralta Martín-Palomino, Arturo

- ♦ CEO and CTO at Prometheus 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
- ♦ PhD in Psychology from the University of Castilla La Mancha
- ♦ PhD in Economics, Business and Finance from the Camilo José Cela University
- ♦ PhD in Psychology from the University of Castilla La Mancha
- ♦ Master's Degree in Executive MBA from the Isabel I University
- ♦ Master's Degree in Sales and Marketing Management, 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. Sánchez Mansilla, Rodrigo

- ♦ Digital Advisor at AI Shepherds GmbH
- ♦ Digital Account Manager at Kill Draper
- ♦ *Head of Digital* at Kuarere
- ♦ Digital Marketing Manager at Arconi Solutions, Deltoid Energy and Brinery Tech
- ♦ *Founder and National Sales and Marketing Manager*
- ♦ Master's Degree in Digital Marketing (MDM) by The Power Business School
- ♦ Bachelor's Degree in Business Administration (BBA) from the University of Buenos Aires

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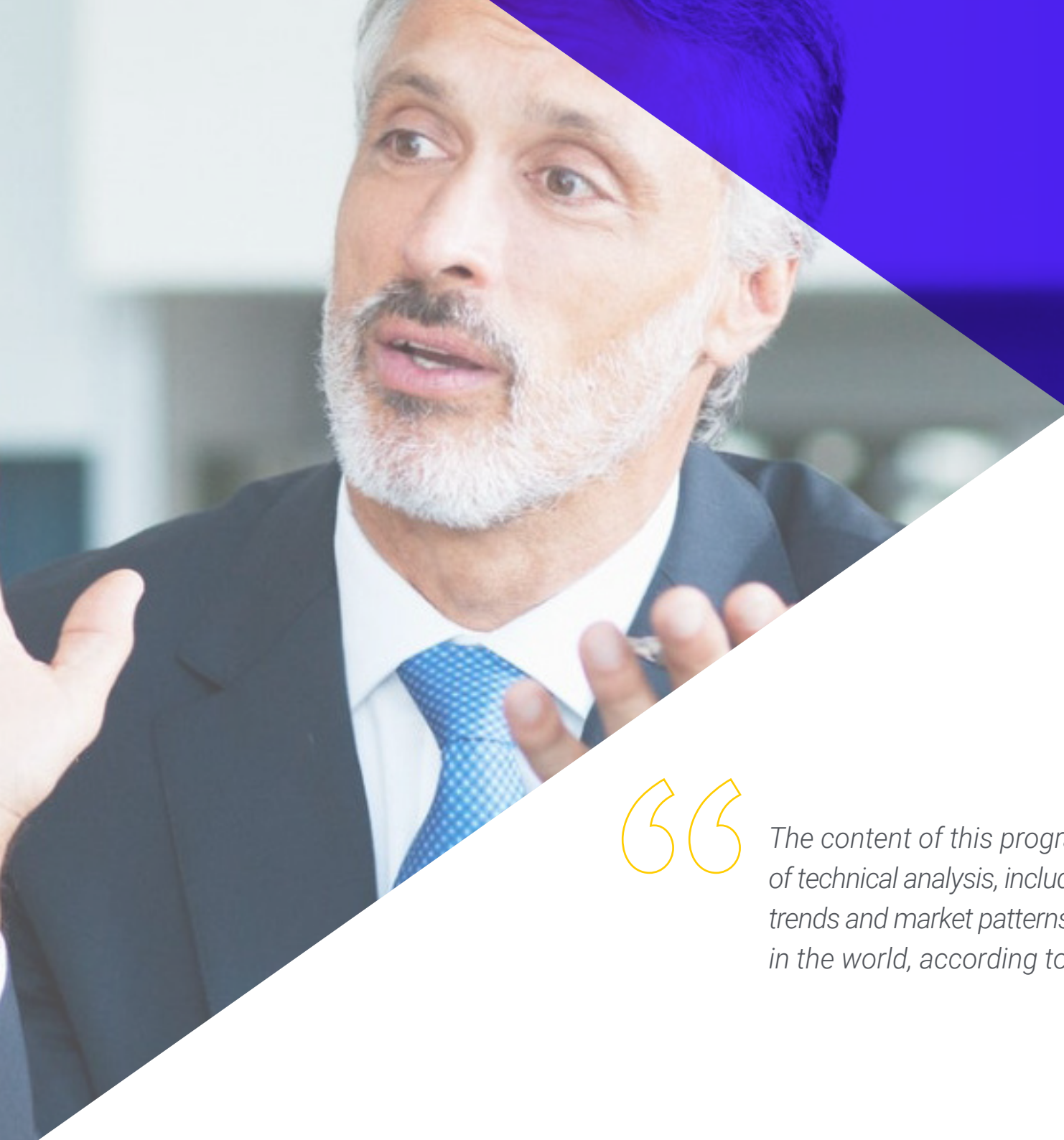
Take the opportunity to learn about the latest advances in this field in order to apply it to your daily practice”

04

Structure and Content

The contents of the program will include advanced tools such as Plotly, Dash and Scikit-learn for the visualization and optimization of technical indicators for better decision making. In addition, Convolutional Neural Networks (CNN) will be implemented for pattern recognition in financial data, improving the identification of trading opportunities. We will also delve into a practical approach to the design and optimization of algorithmic trading strategies, using Reinforcement Learning techniques with TensorFlow, to develop adaptive algorithms that maximize profitability in a dynamic financial environment.





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The content of this program will cover the fundamentals of technical analysis, including the interpretation of charts, trends and market patterns, from the best online university in the world, according to Forbes: TECH”

Module 1. Technical Analysis of Financial Markets with AI

- 1.1. Analysis and Visualization of Technical Indicators with Plotly and Dash
 - 1.1.1. Implementation of Interactive Charts with Plotly
 - 1.1.2. Advanced Visualization of Time Series with Matplotlib
 - 1.1.3. Creating Real-Time Dynamic Dashboards with Dash
- 1.2. Optimization and Automation of Technical Indicators with Scikit-learn
 - 1.2.1. Automation of Indicators with Scikit-learn
 - 1.2.2. Optimization of Technical Indicators
 - 1.2.3. Creating Personalized Indicators with Keras
- 1.3. Financial Pattern Recognition with CNN
 - 1.3.1. Using CNN in TensorFlow to Identify Patterns in Charts
 - 1.3.2. Improving Recognition Models with Transfer Learning Techniques
 - 1.3.3. Validation of Recognition Models in Real-Time Markets
- 1.4. Quantitative Trading Strategies with QuantConnect
 - 1.4.1. Building Algorithmic Trading Systems with QuantConnect
 - 1.4.2. Backtesting Strategies with QuantConnect
 - 1.4.3. Integrating Machine Learning into Trading Strategies with QuantConnect
- 1.5. Algorithmic Trading with Reinforcement Learning Using TensorFlow
 - 1.5.1. Reinforcement Learning for Trading
 - 1.5.2. Creating Trading Agents with TensorFlow Reinforcement Learning
 - 1.5.3. Simulating and Tuning Agents in OpenAI Gym
- 1.6. Time Series Modeling with LSTM in Keras for Price Forecasting
 - 1.6.1. Applying LSTM to Price Forecasting
 - 1.6.2. Implementing LSTM Models in Keras for Financial Time Series
 - 1.6.3. Optimization and Parameter Fitting in Time Series Models
- 1.7. Application of Explainable Artificial Intelligence (XAI) in Finance
 - 1.7.1. Applicability of XAI in Finances
 - 1.7.2. Applying LIME to Trading Models
 - 1.7.3. Using SHAP for Feature Contribution Analysis in AI Decisions



- 1.8. High-Frequency Trading (HFT) Optimized with Machine Learning Models
 - 1.8.1. Developing ML Models for HFT
 - 1.8.2. Implementing HFT Strategies with TensorFlow
 - 1.8.3. Simulation and Evaluation of HFT in Controlled Environments
- 1.9. Volatility Analysis Using Machine Learning
 - 1.9.1. Applying Intelligent Models to Predict Volatility
 - 1.9.2. Implementing Volatility Models with PyTorch
 - 1.9.3. Integrating Volatility Analysis into Portfolio Risk Management
- 1.10. Portfolio Optimization with Genetic Algorithms
 - 1.10.1. Fundamentals of Genetic Algorithms for Investment Optimization in Markets
 - 1.10.2. Implementing Genetic Algorithms for Portfolio Selection
 - 1.10.3. Evaluation of Portfolio Optimization Strategies



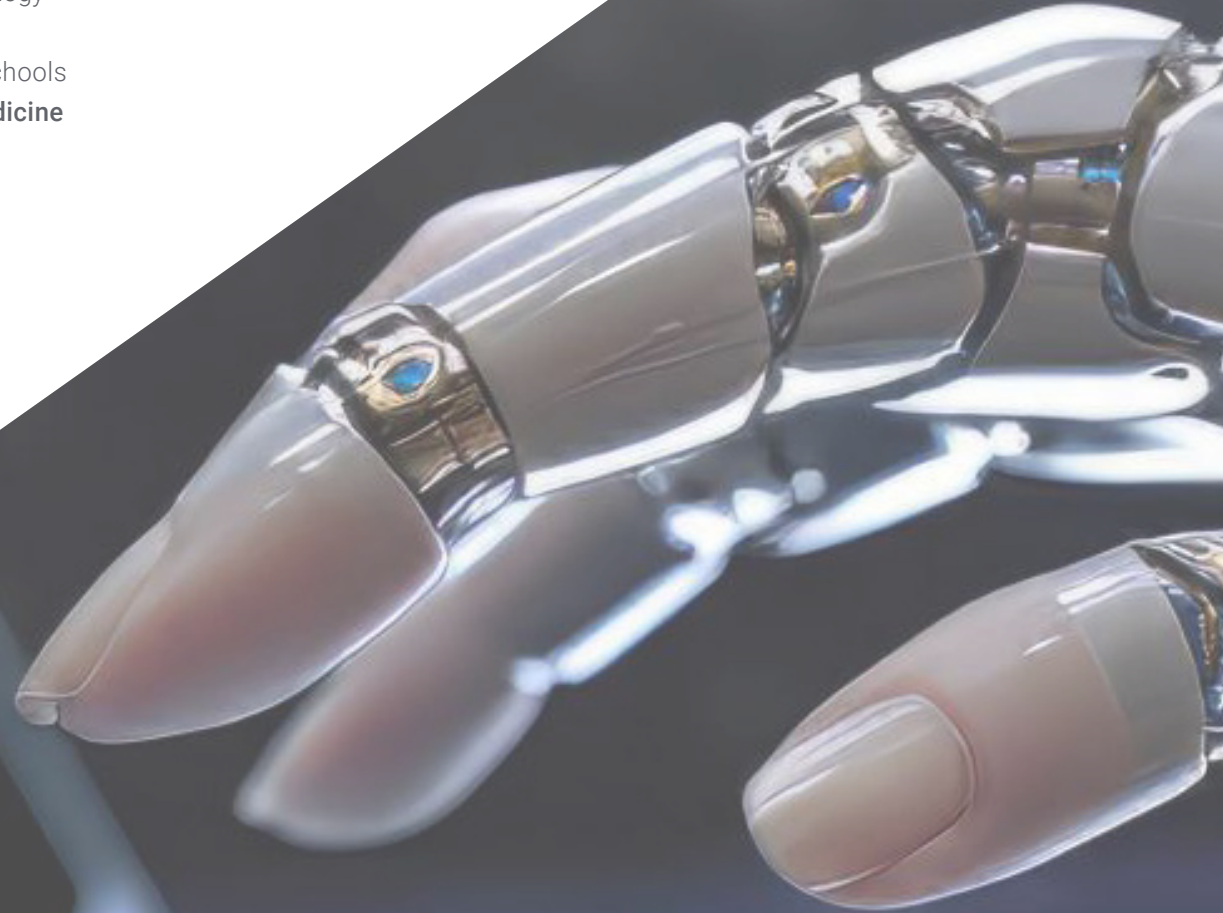
This high quality educational program will open doors to a variety of career opportunities in areas such as trading, investment management and financial consulting. With TECH's quality assurance"

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.





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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.

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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 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.



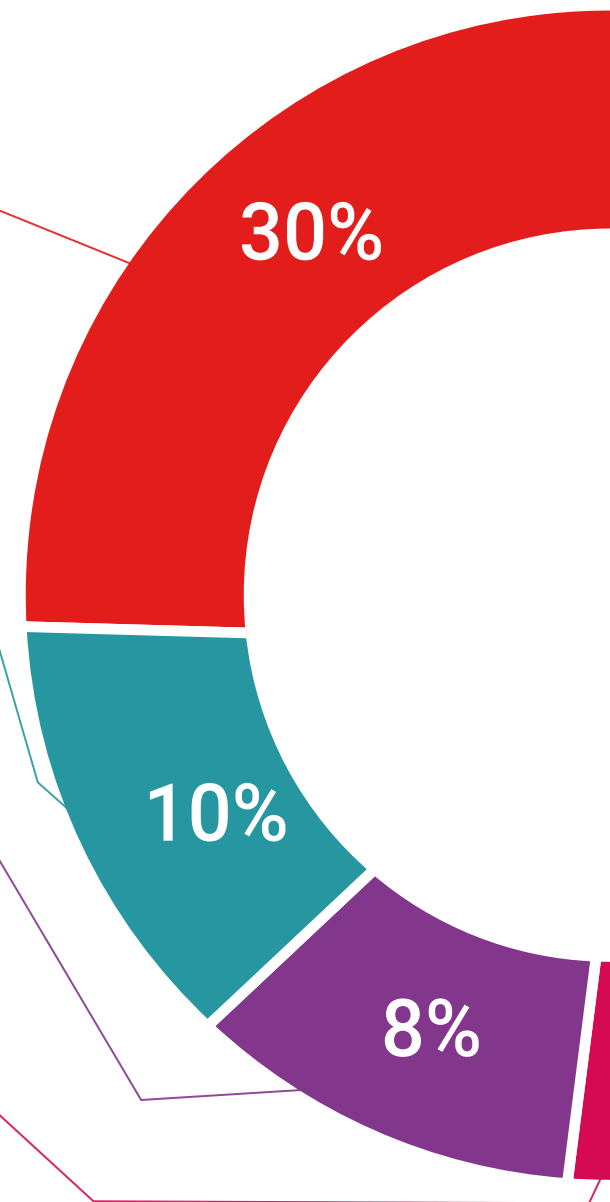
Practising Skills and Abilities

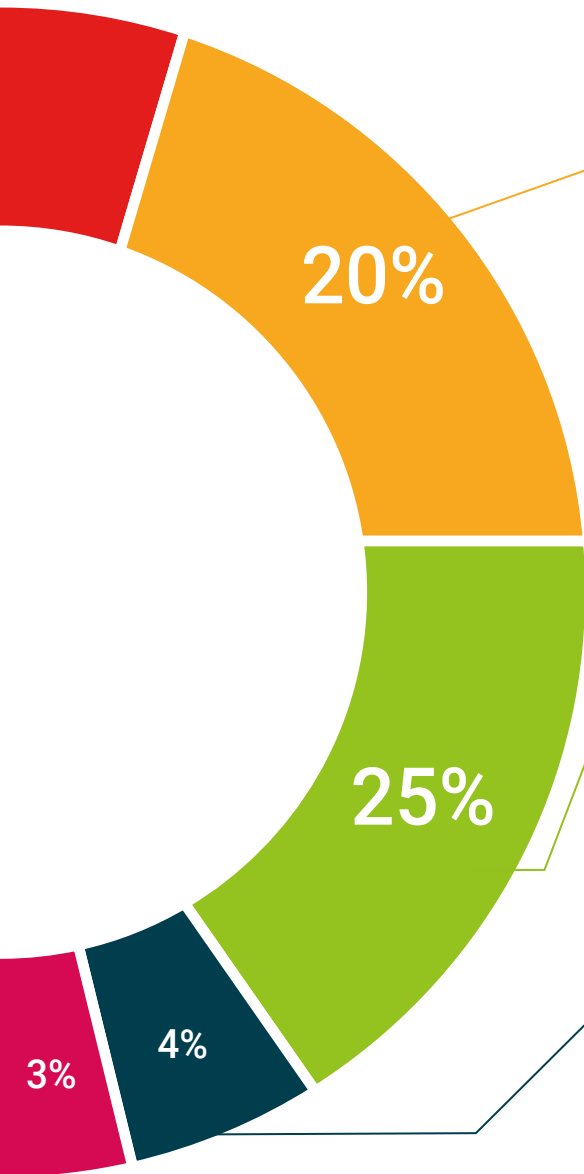
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



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 Certificate in Technical Analysis of Financial Markets with Artificial Intelligence guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological 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 **Postgraduate Certificate in Technical Analysis of Financial Markets with Artificial Intelligence** 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 Technical Analysis of Financial Markets with Artificial Intelligence**

Modality: **online**

Duration: **12 months**

Accreditation: **6 ECTS**



future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

tech global
university

personalized service innovation

knowledge present

online training

development language

virtual classroom

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