



Technical Analysis, Fundamental

Analysis and Algorithmic Trading

» Modality: online

» Duration: 6 months

» Certificate: TECH Global University

» Accreditation: 18 ECTS

» Schedule: at your own pace

» Exams: online

Website: www.techtitute.com/us/artificial-intelligence/postgraduate-diploma/postgraduate-diploma-technical-analysis-fundamental-analysis-algorithmic-trading

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With this 100% online Postgraduate Diploma, you will get solid knowledge in advanced analysis tools and techniques, allowing you to make more informed and strategic decisions in your investments"

tech 06 | Introduction

In today's trading environment, technical analysis and fundamental analysis are essential tools that investors use to make informed decisions. Technical analysis is based on charts and historical price patterns, while fundamental analysis focuses on economic and financial factors, such as earnings reports and macroeconomic data.

This is how this Postgraduate Diploma was created, which will develop the ability to visualize and optimize technical indicators through Artificial Intelligence technologies, improving the analysis and recognition of patterns in financial data. In this sense, it will include the implementation of convolutional neural networks, which increase the accuracy in the identification of trading opportunities, as well as the optimization of strategies through reinforcement learning, ensuring an approach focused on maximizing profitability.

Likewise, professionals will be trained to model and predict the financial performance of companies, using Machine Learning and Deep Learning techniques, to facilitate more informed and strategic investment decisions. In addition, Natural Language Processing (NLP) techniques will be incorporated to analyze financial statements and extract crucial information about the health of companies.

Finally, the design and development of automated trading systems will be addressed, equipping experts with the necessary skills to integrate Machine Learning techniques to improve trading efficiency. Through advanced methods, such as backtesting, they will be able to evaluate and optimize their trading strategies, seeking to maximize their performance.

In this way, TECH has designed a comprehensive 100% online program, which only requires an electronic device with an Internet connection to access all educational resources. This eliminates problems such as the need to travel to a physical location and the imposition of a specific schedule. Additionally, it will be based on the revolutionary Relearning methodology, which focuses on the repetition of key concepts to ensure proper assimilation of content.

This Postgraduate Diploma in Technical Analysis, Fundamental Analysis and Algorithmic Trading 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 self-assessment can be used 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



The focus on Artificial Intelligence and machine learning will give you a competitive advantage by optimizing processes of analysis and execution of trades, with the support of the revolutionary Relearning methodology"



You will develop skills to model and predict the financial performance of companies, using machine learning methods, thanks to an extensive library of innovative multimedia resources"

The program's teaching staff includes professionals from the field who contribute their work experience to this educational 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 in the field of educational coaching with extensive experience.

You will deepen your understanding of risk management, ensuring that algorithmic trading strategies are not only profitable, but also safe, through the best teaching materials, at the forefront of technology and education.

You will use AI techniques, such as convolutional neural networks, to recognize patterns in financial data, identifying trading opportunities with greater accuracy.

With all TECH's quality guarantees!





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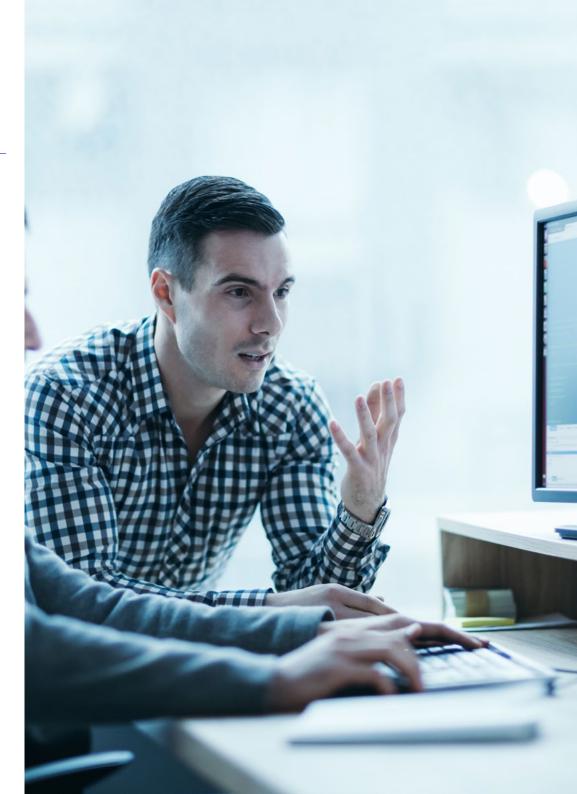
Upon completion, you will be prepared to face the challenges of the financial sector, applying advanced methodologies that will allow you to excel in your career and contribute significantly to the success of your organization"

tech 10 | Objectives



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
- Specialize students to design, implement and optimize algorithmic trading strategies, using Reinforcement Learning and Machine Learning techniques to improve efficiency and profitability in financial markets
- Acquire skills in processing and analyzing large volumes of financial data using Big Data technologies, such as Hadoop and Spark
- Foster the ability to create and apply Artificial Intelligence models that are explainable and transparent, ensuring that Al-based financial decisions are understandable and justifiable
- Develop a thorough understanding of the ethical and regulatory challenges associated with the use of Artificial Intelligence in finance
- 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
- Develop skills in portfolio optimization and financial risk management using genetic algorithms and other advanced Artificial Intelligence techniques to maximize return and minimize investment risk
- Provide the necessary tools and techniques to implement and optimize highfrequency trading strategies, using Machine Learning models to improve the speed and accuracy of order execution
- Apply Al technologies in finance in an ethical and responsible manner, incorporating fairness, transparency and privacy considerations into their solutions





Specific Objectives

Module 1. Technical Analysis of Financial Markets with Al

- 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

Module 2. Fundamental Analysis of Financial Markets with AI

- Learn to model and predict the financial performance of companies using Machine Learning and Deep Learning techniques, facilitating data-driven investment decisions
- Apply Natural Language Processing (NLP) techniques, such as ChatGPT, to analyze and extract relevant information from financial statements, improving the assessment of the financial health of companies.
- Develop skills in financial fraud detection and risk assessment through the use of Machine Learning, ensuring greater security and accuracy in financial decisions

Module 3. Algorithmic Trading Strategies

- Acquire the necessary skills to design and develop automated trading systems, integrating Machine Learning techniques to improve the efficiency and effectiveness of operations
- Learn to evaluate and optimize trading strategies using advanced techniques such as backtesting and Machine Learning, with the objective of maximizing performance in the financial markets
- Develop a thorough understanding of risk management techniques as applied to algorithmic trading, ensuring that strategies are both profitable and safe



You will equip yourself with practical skills in designing automated trading systems, developing skills in risk assessment and fraud detection for safer and more profitable trading"





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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
- 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



Course Management | 15 tech

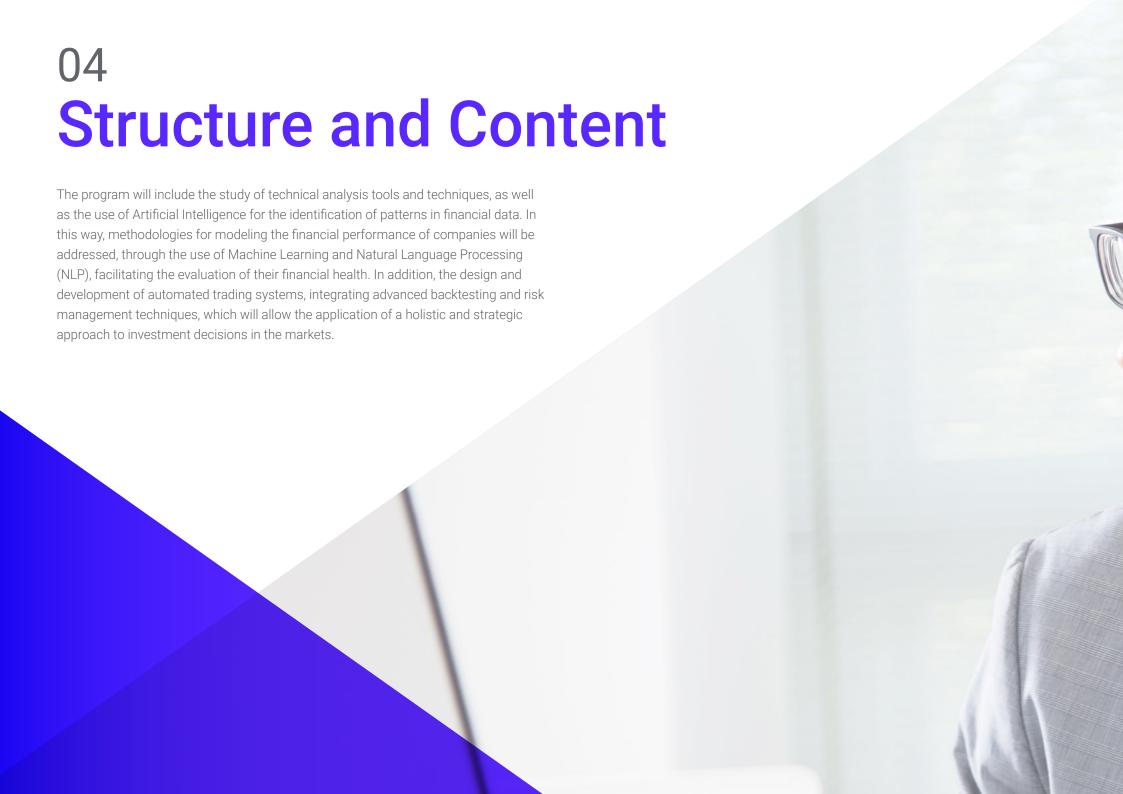
Professors

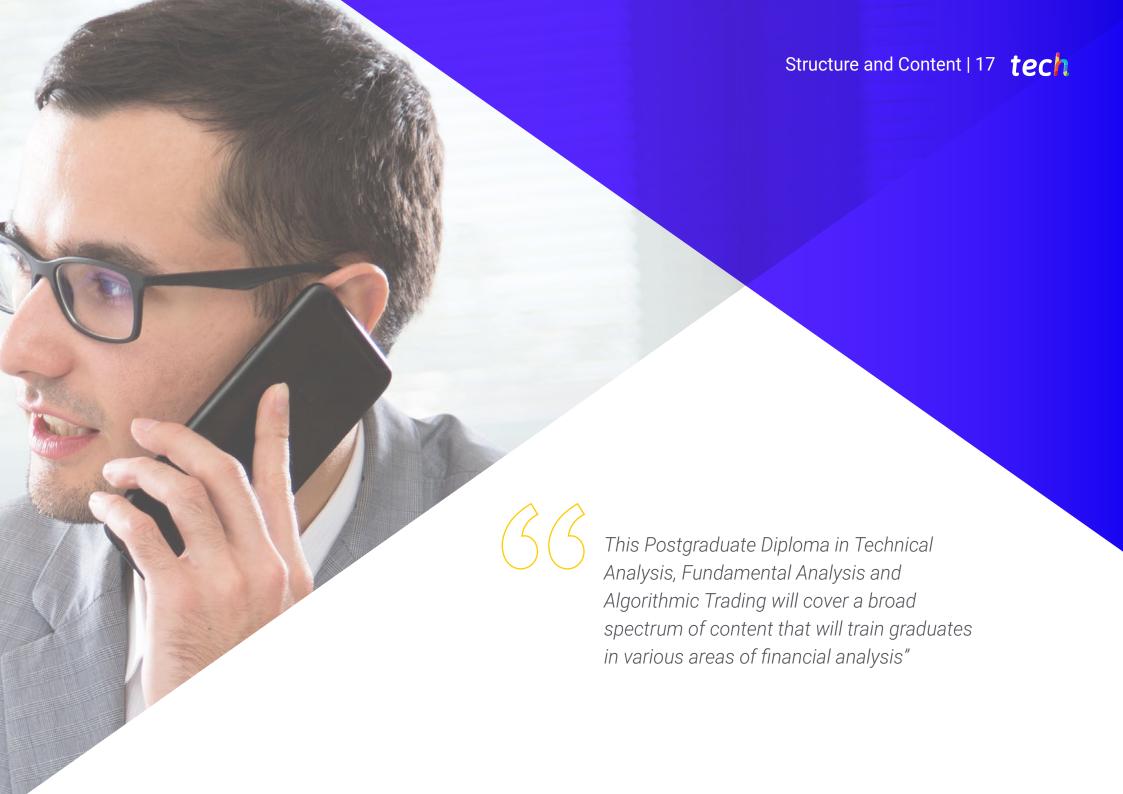
Mr. Sánchez Mansilla, Rodrigo

- Digital Advisor at Al Shepherds GmbH
- Digital Account Manager at Kill Draper
- Head of Digital at Kuarere
- Digital Marketing Manager at Arconi Solutions, Deltoid Energy and Brinergy 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



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





tech 18 | Structure and Content

Module 1. Technical Analysis of Financial Markets with Al

- 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 OpenAl 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 Al Decisions



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- 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

Module 2. Fundamental Analysis of Financial Markets with Al

- 2.1. Predictive Financial Performance Modeling with Scikit-Learn
 - 2.1.1. Linear and Logistic Regression for Financial Forecasting with Scikit-Learn
 - 2.1.2. Using Neural Networks with TensorFlow to Forecast Revenues and Earnings
 - 2.1.3. Validating Predictive Models with Cross-Validation Using Scikit-Learn
- 2.2. Valuation of Companies with Deep Learning
 - 2.2.1. Automating the Discounted Cash Flows (DCF) Model with TensorFlow
 - 2.2.2. Advanced Valuation Models Using PyTorch
 - 2.2.3. Integration and Analysis of Multiple Valuation Models with Pandas
- 2.3. Analysis of Financial Statements with NLP Using ChatGPT
 - 2.3.1. Extracting Key Information from Annual Reports with ChatGPT
 - 2.3.2. Sentiment Analysis of Analyst Reports and Financial News with ChatGPT
 - 2.3.3. Implementing NLP Models with Chat GPT for Interpreting Financial Texts
- 2.4. Risk and Credit Analysis with Machine Learning
 - 2.4.1. Credit Scoring Models Using SVM and Decision Trees in Scikit-Learn
 - 2.4.2. Credit Risk Analysis in Corporations and Bonds with TensorFlow
 - 2.4.3. Visualization of Risk Data with Tableau

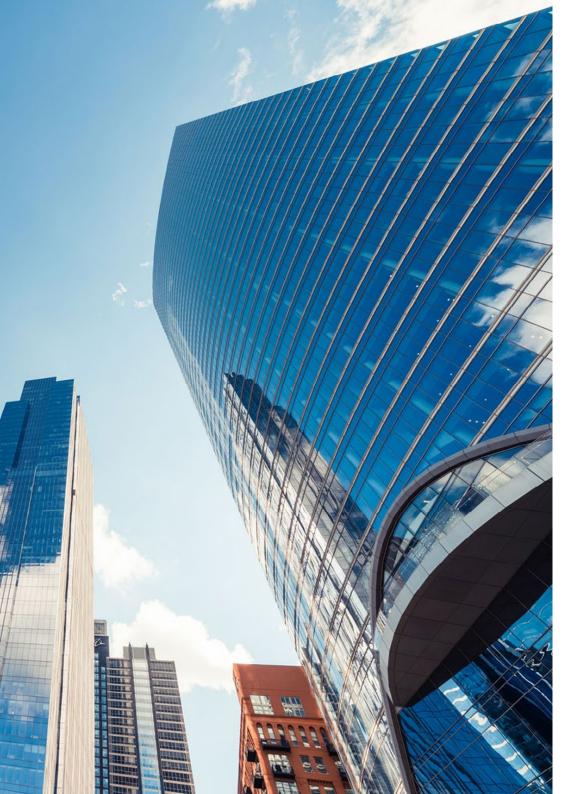
- 2.5. Credit Analysis with Scikit-Learn
 - 2.5.1. Implementing Credit Scoring Models
 - 2.5.2. Credit Risk Analysis with RandomForest in Scikit-Learn
 - 2.5.3. Advanced Visualization of Credit Scoring Results with Tableau
- 2.6. ESG Sustainability Assessment with Data Mining Techniques
 - 2.6.1. ESG Data Mining Methods
 - 2.6.2. ESG Impact Modeling with Regression Techniques
 - 2.6.3. Applications of ESG Analysis in Investment Decisions
- 2.7. Sector Benchmarking with Artificial Intelligence Using TensorFlow and Power BI
 - 2.7.1. Comparative Analysis of Companies Using Al
 - 2.7.2. Predictive Modeling of Sector Performance with TensorFlow
 - 2.7.3. Implementing Industry Dashboards with Power BI
- 2.8. Portfolio Management with Al Optimization
 - 2.8.1. Portfolio Optimization
 - 2.8.2. Use of Machine Learning Techniques for Portfolio Optimization with Scikit-Optimize
 - 2.8.3. Implementing and Evaluating the Effectiveness of Algorithms in Portfolio Management
- 2.9. Financial Fraud Detection with Al Using TensorFlow and Keras
 - 2.9.1. Basic Concepts and Techniques of Fraud Detection with Al
 - 2.9.2. Constructing Neural Network Detection Models in TensorFlow
 - 2.9.3. Practical Implementation of Fraud Detection Systems in Financial Transactions
- 2.10. Analysis and Modeling in Mergers and Acquisitions with Al
 - 2.10.1. Using Predictive AI Models to Evaluate Mergers and Acquisitions
 - 2.10.2. Simulating Post-Merger Scenarios Using Machine Learning Techniques
 - 2.10.3. Evaluating the Financial Impact of M&A with Intelligent Models

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Module 3. Algorithmic Trading Strategies

- 3.1. Fundamentals of Algorithmic Trading
 - 3.1.1. Algorithmic Trading Strategies
 - 3.1.2. Key Technologies and Platforms for the Development of Algorithmic Trading Algorithms
 - 3.1.3. Advantages and Challenges of Automated Trading versus Manual Trading
- 3.2. Design of Automated Trading Systems
 - 3.2.1. Structure and Components of an Automated Trading System
 - 3.2.2. Algorithm Programming: from the Idea to the Implementation
 - 3.2.3. Latency and Hardware Considerations in Trading Systems
- 3.3. Backtesting and Evaluation of Trading Strategies
 - 3.3.1. Methodologies for Effective Backtesting of Algorithmic Strategies
 - 3.3.2. Importance of Quality Historical Data in Backtesting
 - 3.3.3. Key Performance Indicators for Evaluating Trading Strategies
- 3.4. Optimizing Strategies with Machine Learning
 - 3.4.1. Applying Supervised Learning Techniques in Strategy Improvement
 - 3.4.2. Using Particle Swarm Optimization and Genetic Algorithms
 - 3.4.3. Challenges of Overfitting in Trading Strategy Optimization
- 3.5. High Frequency Trading (HFT)
 - 3.5.1. Principles and Technologies behind HFT
 - 3.5.2. Impact of HFT on Market Liquidity and Volatility
 - 3.5.3. Common HFT Strategies and Their Effectiveness
- 3.6. Order Execution Algorithms
 - 3.6.1. Types of Execution Algorithms and Their Practical Application
 - 3.6.2. Algorithms for Minimizing the Market Impact
 - 3.6.3. Using Simulations to Improve Order Execution
- 3.7. Arbitration Strategies in Financial Markets
 - 3.7.1. Statistical Arbitrage and Price Merger in Markets
 - 3.7.2. Index and ETF Arbitrage
 - 3.7.3. Technical and Legal Challenges of Arbitrage in Modern Trading





Structure and Content | 21 tech

- 8.8. Risk Management in Algorithmic *Trading*
 - 3.8.1. Risk Measures for Algorithmic Trading
 - 3.8.2. Integrating Risk Limits and Stop-Loss in Algorithms
 - 3.8.3. Specific Risks of Algorithmic Trading and How to Mitigate Them
- 3.9. Regulatory Aspects and Compliance in Algorithmic Trading
 - 3.9.1. Global Regulations Impacting Algorithmic Trading
 - 3.9.2. Regulatory Compliance and Reporting in an Automated Environment
 - 3.9.3. Ethical Implications of Automated Trading
- 3.10. Future of Algorithmic Trading and Emerging Trends
 - 3.10.1. Impact of Artificial Intelligence on the Future Development of Algorithmic Trading
 - 3.10.2. New Blockchain Technologies and Their Application in Algorithmic Trading
 - 3.10.3. Trends in Adaptability and Customization of Trading Algorithms



In a constantly evolving
environment, this specialization
will become a valuable investment
for those looking to stand out and
maximize their potential in the
Stock and Financial Markets sector"





tech 24 | Methodology

Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.



At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world"



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



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

A learning method that is different and innovative

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



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

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

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



Relearning Methodology

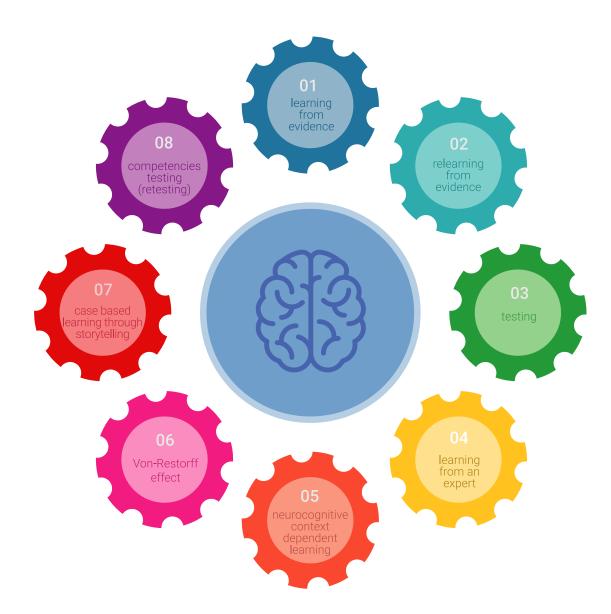
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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

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

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

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



Methodology | 27 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. 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.



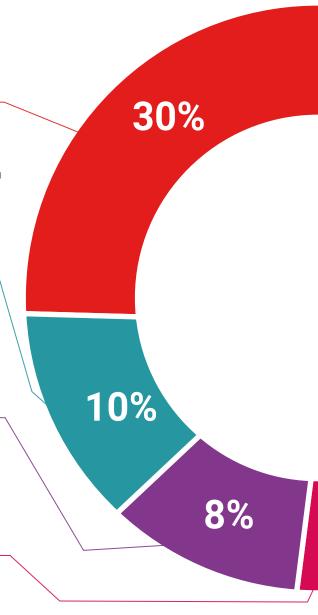
Practising Skills and Abilities

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.



20% 25%

4%

3%

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.

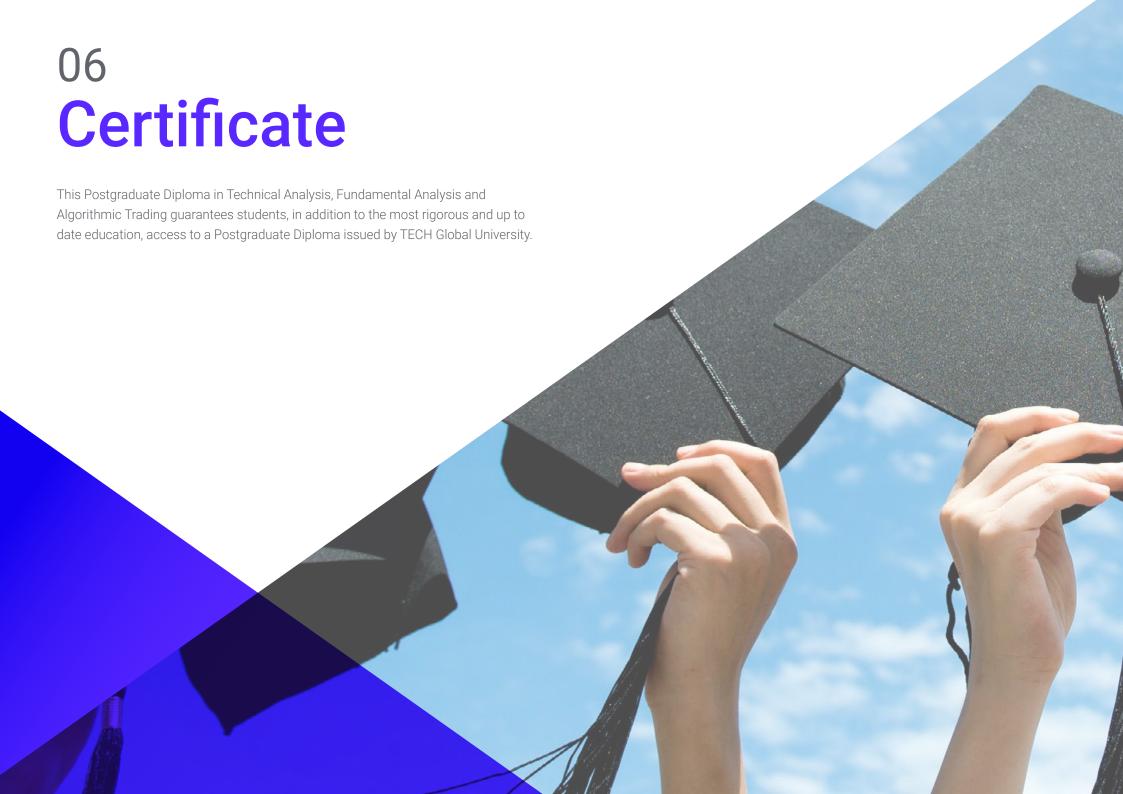




Testing & Retesting

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.







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This private qualification will allow you to obtain a **Postgraduate Diploma in Technical Analysis, Fundamental Analysis and 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.

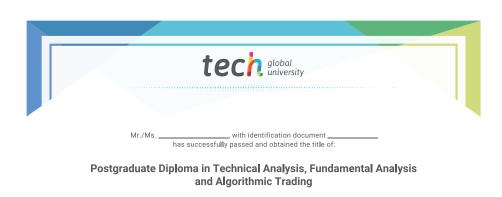
This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: Postgraduate Diploma in Technical Analysis, Fundamental Analysis and Algorithmic Trading

Modality: online

Duration: 6 months

Accreditation: 18 ECTS



This is a private qualification of 540 hours of duration equivalent to 18 ECTS, with a start date of

dd/mm/yyyy and an end date of dd/mm/yyyy.
TECH Global University is a university officially recognized by the Government of Andorra on the 31st

of January of 2024, which belongs to the European Higher Education Area (EHEA)

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana

health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning



Postgraduate Diploma Technical Analysis, Fundamental Analysis and Algorithmic Trading

- » Modality: online
- » Duration: 6 months
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