Postgraduate Certificate
Advanced Financial Optimization Techniques with OR-Tools
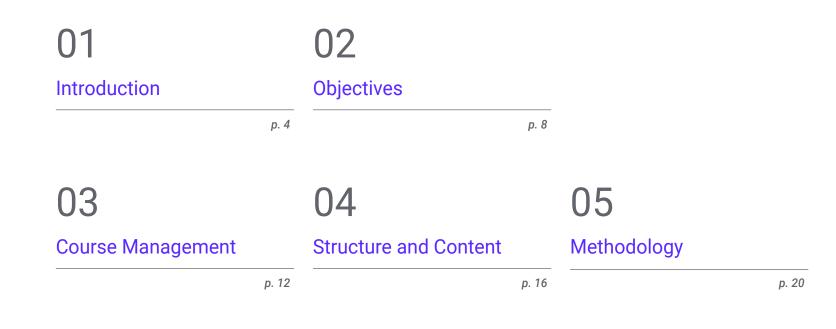
tech global university

Postgraduate Certificate
Advanced Financial Optimization Techniques with OR-Tools

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

Website: **www.techtitute.com/us/artificial-intelligence/postgraduate-certificate/advanced-financial-optimization-techniques-or-tools**

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01

Introduction

Financial Optimization is a crucial component in strategic decision making within organizations. Given the complexity of markets and the availability of large volumes of data, advanced techniques are required that not only improve operational efficiency, but also maximize return on investment. Against this backdrop, OR-Tools provides a robust set of tools that enable financial analysts to model and solve complex financial problems. It is therefore essential for experts to handle this tool effectively in order to improve portfolio management, resource allocation and risk assessment. In this framework, TECH launches a pioneering online program focused on Advanced Financial Optimization Techniques with OR-Tools.

With this Relearning based program you will master OR-Tools and solve complex Financial Optimization problems"

A new study conducted by the World Economic Forum reflects that an organization's ability to make informed and optimized decisions is a key determinant of its competitiveness. In this sense, the OR-Tools library developed by Google is a powerful tool to address complex problems in financial management. Among its main advantages is its ability to create simulations and analysis of different financial scenarios, allowing professionals to evaluate how different variables can affect their decisions.

In this context, TECH presents an innovative program in Advanced Financial Optimization Techniques with OR-Tools. Designed by references in this field, the academic itinerary will delve into aspects ranging from the implementation of genetic algorithms in finance or Markowits models to improve portfolios to the most modern tools for solving linear programming problems. Likewise, the agenda will delve into how Machine Learning algorithms can be used to improve the selection of assets in a portfolio, maximizing returns and minimizing risks.

On the other hand, regarding the methodology of this university program, TECH offers a 100% online educational environment that allows experts to combine their studies with the rest of their daily responsibilities. In turn, it employs its disruptive Relearning system, based on the reiteration of key concepts to fix knowledge and facilitate learning. In this sense, the only requirement is that students have an electronic device with an Internet connection, including their own cell phone. In this way, students will be able to enter the Virtual Campus to enjoy an immersive experience that elevates the learning process.

This **Postgraduate Certificate** in **Advanced Financial Optimization Techniques with OR-Tools** contains the most complete and up-to-date program on the market. The most important features include:

- Development of practical cases presented by experts in Artificial Intelligence
- 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
- Content that is accessible from any fixed or portable device with an Internet connection

This program gives you the opportunity to increase your knowledge in a real scenario, with the maximum scientific rigor of an institution at the forefront of technology"

"Looking to acquire skills to analyze large volumes of financial data to improve strategic decisions? Get it through this program"

You will delve into the most sophisticated Stochastic Optimization models to allocate financial resources under uncertainty conditions.

As this is a 100% online university program, you will be able to combine your studies with the rest of your daily activities.

The program's teaching staff includes professionals from the sector who contribute their work experience to this specializing 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 and experienced experts.

02
Objectives

Through this program, professionals will have a solid understanding of Advanced Financial Optimization Techniques with OR-Tools. In this sense, graduates will be able to translate financial problems into appropriate mathematical models that can be optimized using this specialized software. In addition, students will apply optimization methods in the efficient allocation of financial resources, therefore maximizing the return on investment. In addition, experts will carry out simulations and scenario analysis to evaluate the impact of various financial strategies.

You will acquire advanced skills in the collection, processing and analysis of large volumes of financial data to make highly informed strategic decisions"

General Objectives

- Apply Artificial Intelligence techniques in financial decision making
- Develop predictive models for financial risk management
- Optimize the allocation of financial resources using AI algorithms
- Automate routine financial processes using machine learning
- Implement natural language processing tools for the analysis of financial data
- Design recommender systems for the financial sector
- Analyze large volumes of financial data using Big Data techniques
- Evaluate the impact of Artificial Intelligence on companies' profitability
- Improve financial fraud detection with the use of AI
- Create financial asset valuation models using Artificial Intelligence
- Develop financial simulation tools based on AI algorithms
- Apply data mining techniques to identify financial patterns
- Develop optimization models for financial planning
- Use neural networks to improve prediction of market trends
- Develop AI-based solutions for financial product personalization
- Implement AI systems for automated investment decisions
- Develop analytical capabilities for interpreting the results of financial AI models
- Investigate the use of Artificial Intelligence in financial regulation and compliance
- Develop AI solutions to reduce costs in financial processes
- Identify opportunities for innovation in the financial sector through AI

Specific Objectives

- Master investment portfolio optimization techniques using linear, nonlinear and stochastic programming to improve financial portfolios
- Apply genetic algorithms in financial optimization, exploring innovative solutions to complex problems

You will achieve your objectives with the support of TECH's didactic tools, including interactive summaries, explanatory videos and specialized readings"
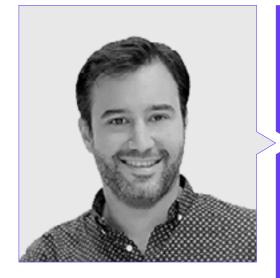
Course Management

TECH's primary objective is to offer the most complete and up-to-date university program in the academic panorama, which is why it carries out a meticulous process to institute its teaching staff. For the delivery of this Postgraduate Certificate, TECH has enlisted the services of the best experts in Advanced Financial Optimization Techniques with OR-Tools. These professionals have elaborated a wide range of didactic materials defined by their high quality as well as by their adaptation to the requirements of the current labor market. In this way, students will enter into an intensive experience that will allow them to improve their career prospects considerably.

"

You will access a study plan designed by prestigious specialists in Advanced Financial Optimization Techniques with OR-Tools"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO at AI Shephers 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 theUniversity of Castilla La Mancha
- Máster in Executive MBA por la Universidad Isabel I
- 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

Dr. Carrasco Aguilar, Álvaro

- Sales & Marketing Coordinator at LionLingo
- Researcher in Information Technology Management
- PhD in Social and Health Research: Technical and Economic Evaluation of Technologies, Interventions and Policies Applied to Health Improvement from the University of Castilla La Mancha
- Master's Degree in Social and Health Research from the University of Castilla - La Mancha
- Degree in Political Science and Administration at the University of Granada
- Award for "Best Scientific Article for Technological Innovation for the Efficiency of Health Expenditure"
- Regular speaker at international scientific congresses

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

This university program has been developed by recognized experts in Advanced Financial Optimization Techniques with OR-Tools. The study plan will delve into issues such as the application of genetic algorithms to improve financial planning, solving linear programming problems or the use of Python. At the same time, the syllabus will delve into how Machine Learning-based algorithms are used to analyze large volumes of historical data to forecast trends in financial markets and make more informed strategic decisions. In this way, students will acquire advanced skills to handle OR-Tools and address numerous financial problems.

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"
You will apply the most sophisticated Financial Optimization Techniques for portfolio management and resource allocation"

Module 1. Advanced Financial Optimization Techniques with OR-Tools

1.1. Introduction to Financial Optimization

    1.1.1. Basic Optimization Concepts

    1.1.2. Optimization Tools and Techniques in Finance

    1.1.3. Applications of Optimization in Finance

1.2. Investment Portfolio Optimization

    1.2.1. Markowitz Models for Portfolio Optimization

    1.2.2. Portfolio Optimization with Constraints

    1.2.3. Implementation of Optimization Models with OR-Tools in Python

1.3. Genetic Algorithms in Finance

    1.3.1. Introduction to Genetic Algorithms

    1.3.2. Application of Genetic Algorithms in Financial Optimization

    1.3.3. Practical Examples and Case Studies

1.4. Linear and Nonlinear Programming in Finance

    1.4.1. Fundamentals of Linear and Nonlinear Programming

    1.4.2. Applications in Portfolio Management and Resource Optimization

    1.4.3. Tools for Solving Linear Programming Problems

1.5. Stochastic Optimization in Finance

    1.5.1. Concepts of Stochastic Optimization

    1.5.2. Applications in Risk Management and Financial Derivatives

    1.5.3. Stochastic Optimization Models and Techniques

1.6. Robust Optimization and its Application in Finance

    1.6.1. Fundamentals of Robust Optimization

    1.6.2. Applications in Uncertain Financial Environments

    1.6.3. Case Studies and Examples of Robust Optimization

1.7. Multi-Objective Optimization in Finance

    1.7.1. Introduction to Multiobjective Optimization

    1.7.2. Applications in Diversification and Asset Allocation

    1.7.3. Techniques and Tools for Multiobjective Optimization

You will be able to download the entire syllabus from the first day of the course, being able to study it comfortably from your smartphone or tablet of choice." Enroll now!"

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.

" *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.
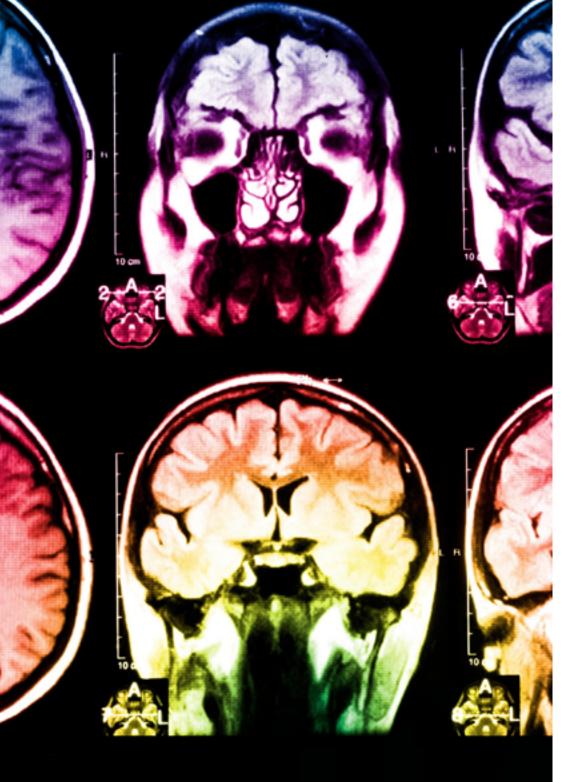
01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

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.

30%

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.

10%

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.

8%

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.

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 Advanced Financial Optimization Techniques with OR-Tools guarantees students, in addition to the most rigorous and up-to-date education, access to a 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 **Postgraduate Certificate in Advanced Financial Optimization Techniques with OR-Tools** 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 Advanced Financial Optimization Techniques with OR-Tools**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**

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

Postgraduate Certificate in Advanced Financial Optimization Techniques with OR-Tools

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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