Postgraduate Certificate

Stochastic Phenomena Predictability and Analysis in Data Science

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Postgraduate Certificate

Stochastic Phenomena Predictability and Analysis in Data Science

- Modality: **online**
- Duration: **6 weeks**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/us/information-technology/postgraduate-certificate/stochastic-phenomena-predictability-analysis-data-science

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01

Introduction

Companies generate a large amount of data, which increases exponentially every year. As a result, it is difficult to analyze and visualize it all correctly. That is why computer engineers must be familiar with the different tools and techniques used to more efficiently analyze and interpret data, such as regression techniques, predictive time series models or basic forecasting methods. This program will lay the foundations to represent and interpret this information.

Launch the main phases in data science processes: graphical representation for exploratory analysis"

This Postgraduate Certificate will analyze the theoretical bases that help computer engineers to make the most appropriate graphical representations when using Data Science as an analytical technique. Therefore, special emphasis will be placed on the correct way to represent and interpret data in order to identify past errors or inefficient tactics to anticipate the future.

The entire program is composed of a series of case studies that will favor the learning of students who seek to further advance their professional careers and challenge themselves to achieve excellence. Consequently, there will be examples of new technologies for data visualization, such as intelligent systems or reality visualization systems.

All this will be feasible thanks to a 100% online program, which adapts to the daily needs of its students. You will only need a device with an Internet connection to start developing a complete professional profile with international projection.

This **Postgraduate Certificate in Stochastic Phenomena Predictability and Analysis in Data Science** contains the most complete and up to date academic program on the market.
The most important features of the program include:

- Practical cases studies are presented by experts in Engineering in data analysis
- The graphic, schematic, and eminently 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
- Access to content from any fixed or portable device with an Internet connection

Establish the most used graphic representations in different fields”

The online format will enable the program to adapt to you. Choose the best time to watch a class and continue training in your field of interest"

This program will develop the formulation and basic properties of univariate time series models.

It includes a series of case studies to perfectly understand univariate models.

The program's teaching staff includes professionals from the sector who contribute their work experience to this training 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 training programmed to train in real situations.

The design of this program focuses on Problem-Based Learning, which means the student must try to solve the different real-life situations of that arise throughout the academic program. This will be done with the help of an innovative, interactive video system developed by renowned experts with extensive personal training experience.

02

Objectives

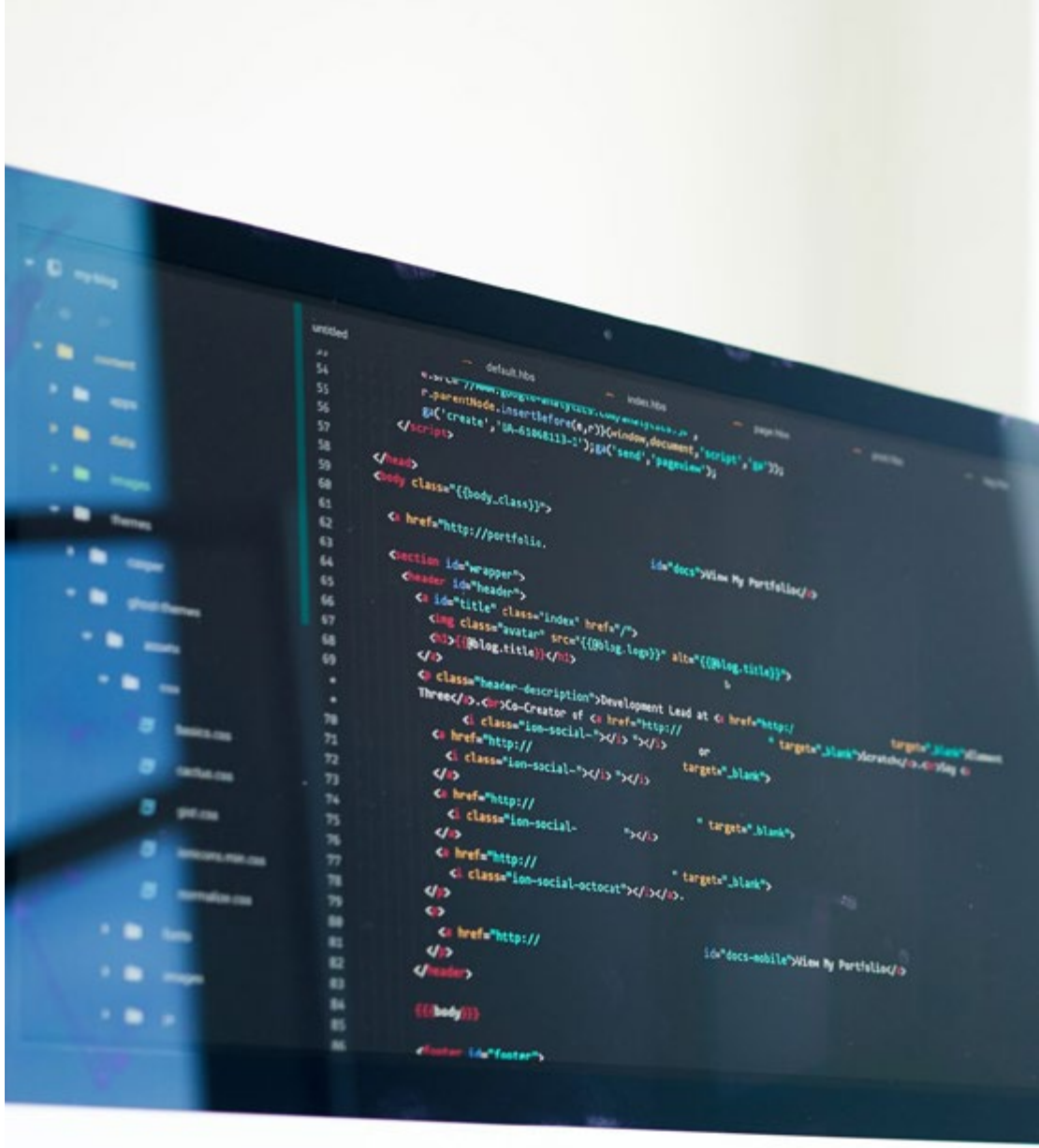
The knowledge provided on this program will help computer engineers gain specialized knowledge of time series models, which will facilitate the analysis of stochastic phenomena that develop over time and hinder the company work. To that end, TECH has established the following general and specific objectives:

Apply dynamic regression models and the methodology used to build such models from observed series"

General Objectives

- Analyze the benefits of applying data analytic techniques in every company department
- Develop the basis for understanding the needs and applications of each department
- Generate specialized knowledge to select the right tool
- Propose techniques and objectives in order to be as productive as possible according to the department

Univariate models will help you build a simple model for data analysis"



Specific Objectives

- Analyze time series
- Develop the formulation and basic properties of univariate time series models
- Examine the methodology of modeling and prediction of real time series
- Assess univariate models including outliers
- Apply dynamic regression models and apply the methodology for the construction of such models from observed series
- Address the spectral analysis of univariate time series, as well as the fundamentals related to periodogram-based inference and interpretation
- Estimate the probability and trend in time series for a given time horizon

03

Course Management

The Postgraduate Certificate in Stochastic Phenomena Predictability and Analysis in Data Science brings together a select group of professionals with multiple years of experience in data analysis in the field of business. Students are thus guaranteed that the knowledge imparted comes from professionals capable of answering any questions they may have while providing them with real cases to better exemplify the contents on the program.

Our teaching team is trained to guide and support you throughout the program, answering your questions and presenting practical examples"

Management

Dr. Peralta Martín-Palomino, Arturo

- CEO and CTO at Prometeus Global Solutions
- CTO at Korporate Technologies
- CTO in AI Shephers GmbH
- Doctorate in Psychology from the University of CastillaLa
- PhD in Economics, Business and Finance from the Camilo José Cela University. Outstanding Award in her PhD
- PhD in Psychology, University of CastillaLa Mancha
- Master's Degree in Advanced Information Technologies from the University of Castilla la Mancha
- Master MBA+E (Master's Degree in Business Administration and Organisational Engineering) from the University of Castilla la Mancha.
- Associate lecturer, teaching undergraduate and master's degrees in Computer Engineering at the University of Castilla la Mancha.
- Professor of the Master in Big Data and Data Science at the International University of Valencia.
- Lecturer of the Master's Degree in Industry 4.0 and the Master's Degree in Industrial Design and Product Development.
- Member of the SMILe Research Group of the University of Castilla la Mancha.

Professors

Ms. Fernández Meléndez, Galina

- Data Analyst in ADN Mobile Solution
- ETL processes, data mining, data analysis and visualization, establishment of KPI's, Dashboard design and implementation, management control R development and SQL management, among others
- Pattern determination, predictive modeling, machine learning
- Bachelor's degree in Business Administration Bicentenaria de Aragua-Caracas University
- Certificate in Planning and Public Finance Venezuelan School School of Planning-School of Finance
- Professional Master's Degree in Data Analysis and Business Intelligence. University of Oviedo
- MBA in Business Administration and Management (Escuela De Negocios Europea De Barcelona)
- Master in Big Data and Business Intelligence (Escuela de Negocios Europea de Barcelona)

04

Structure and Content

The program modules offer a theoretical and practical perspective to analyze the models that present greater versatility and adaptability for the analysis of time series, such as economic series models. Thus will the objectives of the program to train professional, integral and prestigious engineers be fulfilled.

Predict the behavior of a time series on the basis of the models studied"

Module 1. Stochastic Phenomena Predictability and Analysis

1.1. Time Series
- 1.1.1. Time Series
- 1.1.2. Utility and Applicability
- 1.1.3. Related Case Studies

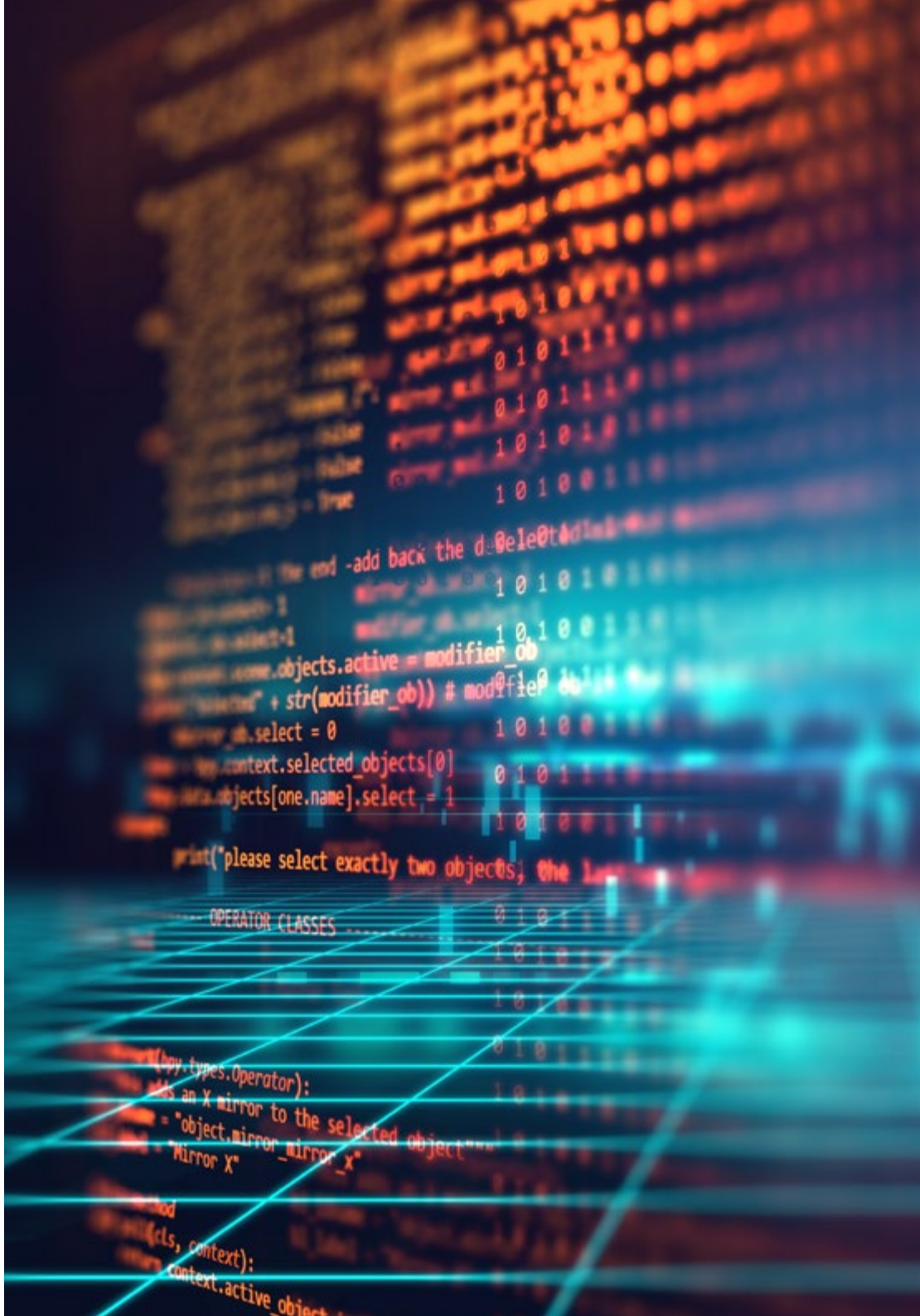
1.2. Time Series
- 1.2.1. Seasonal Trend of ST
- 1.2.2. Typical Variations
- 1.2.3. Waste Analysis

1.3. Typology
- 1.3.1. Stationary
- 1.3.2. Non-Stationary
- 1.3.3. Transformations and Settings

1.4. Time Series Schemes
- 1.4.1. Additive Scheme (Model)
- 1.4.2. Multiplicative Scheme (Model)
- 1.4.3. Procedures to Determine the Type of Model

1.5. Basic Forecast Methods
- 1.5.1. Media
- 1.5.2. Naïve
- 1.5.3. Seasonal Naïve
- 1.5.4. Method Comparison

1.6. Waste Analysis
- 1.6.1. Autocorrelation
- 1.6.2. ACF of Waste
- 1.6.3. Correlation Test



1.7. Regression in the Context of Time Series
- 1.7.1. ANOVA
- 1.7.2. Fundamentals
- 1.7.3. Practical Applications

1.8. Predictive Methods of Time Series
- 1.8.1. ARIMA
- 1.8.2. Exponential Smoothing

1.9. Manipulation and Analysis of Time Series with R
- 1.9.1. Data Preparation
- 1.9.2. Identification of Patterns
- 1.9.3. Model Analysis
- 1.9.4. Prediction

1.10. Combined Graphical Analysis with R
- 1.10.1. Normal Situations
- 1.10.2. Practical Application for the Resolution of Simple Problems
- 1.10.3. Practical Application for the Resolution of Advanced Problems

Become skilled at manipulating and analyzing time series, preparing the data and predicting its behavior"

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.

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

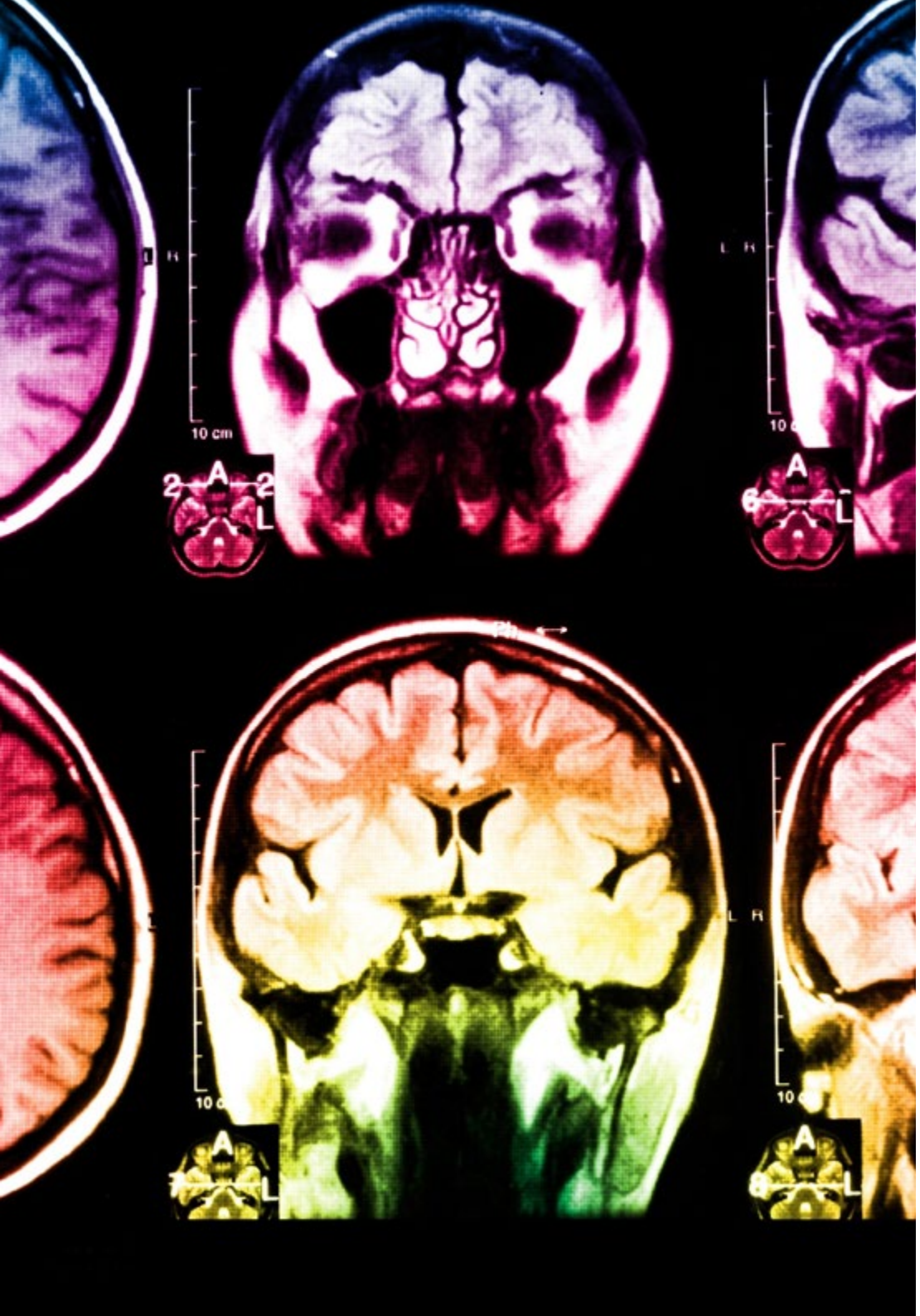
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.



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.

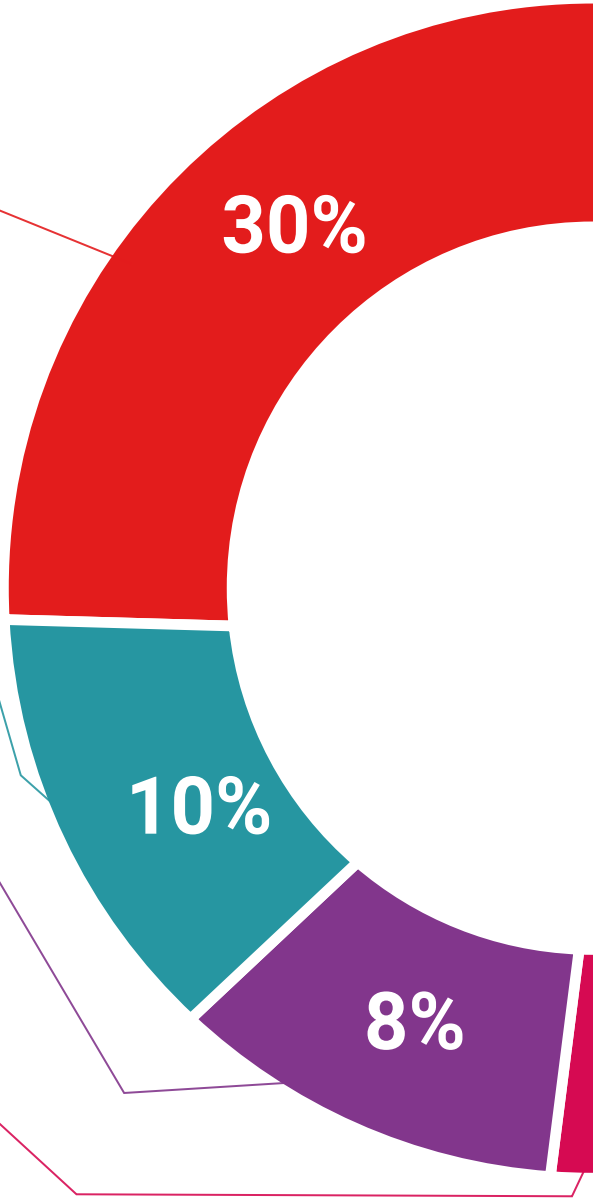
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

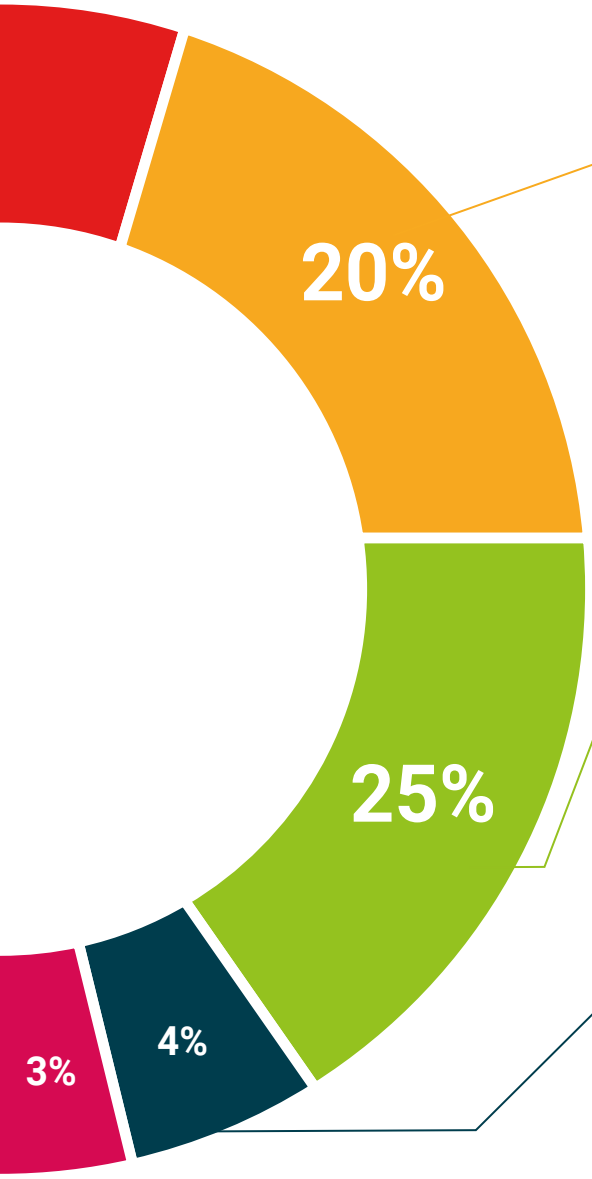
Practising Skills and Abilities

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 Stochastic Phenomena Predictability and Analysis in Data Science guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.

Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork"

This **Postgraduate Certificate in Stochastic Phenomena Predictability and Analysis in Data Science** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery*.

The certificate issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets requirements commonly demanded by labor exchanges, competitive examinations and professional from from career evaluation committees.

Title: **Postgraduate Certificate in Stochastic Phenomena Predictability and Analysis in Data Science**

Official Number of Hours: **150 h.**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Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Stochastic Phenomena Predictability and Analysis in Data Science

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro

Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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