Postgraduate Certificate

Data Analysis and Processing

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Postgraduate Certificate
Data Analysis and Processing

- Modality: **online**
- Duration: **12 weeks**
- Certificate: **TECH Global University**
- Credits: **12 ECTS**
- Schedule: **at your own pace**
- Exams: **online**

Website: **www.techtitute.com/us/engineering/postgraduate-certificate/data-analysis-processing**

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01

Introduction

Data analysis and processing is a fundamental skill for any area of engineering. Engineers often work with large data sets that can be messy and complex, so they need to have advanced skills to clean and analyze this information effectively. The ability to perform accurate and rigorous data analysis is critical to success on the job. For this reason, TECH has designed a program that allows students to maximize their knowledge on aspects such as the main database management systems, the detection of missing values or the design of applications, among others. All this, thanks to a 100% online format and with the most dynamic and practical multimedia materials in the academic market.

Improve your skills on Database Application Development, thanks to the best online university in the world according to Forbes, thanks to TECH"

Data analysis is fundamental to engineering decision making. These professionals use data to design and develop products and systems, identify problems, or evaluate the performance of existing systems. If data is not analyzed correctly, incorrect decisions can be made or good opportunities can be lost.

For this reason, TECH has designed a Postgraduate Certificate in Data Analysis and Processing with which it seeks to provide students with the necessary skills and competencies to be able to perform their work as specialists, with the highest possible efficiency and quality. Therefore, throughout this program, aspects such as Database Design Stages, Missing Value Imputation, Homoscedasticity Tests, Data Files or Notions of HTML and Regular Expressions will be addressed.

All this, through a convenient 100% online format that allows students to organize their schedules and studies, combining them with their other day-to-day work and interests. In addition, this qualification has the most complete theoretical and practical materials on the market, which facilitates the student's study process and allows them to achieve their goals quickly and efficiently.

This **Postgraduate Certificate in Data Analysis and Processing** contains the most complete and up-to-date program on the market. The most important features include:

- The development of practical cases presented by experts in Data Analysis and Processing
- 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
- The availability of access to the contents from any device fixed or portable device with Internet connection
- Content that is accessible from any fixed or portable device with an Internet connection

Become the successful professional you have always wanted to be in the field of Data Analysis and Processing, in just 12 weeks and with total freedom of organization"

Enhance your professional profile in one of the most promising areas in the field of Economic Statistics, thanks to TECH and the most innovative materials"

Delve into the Stages of Database Design from the comfort of your home and at any time of the day.

Access all the content on HTML Notions and Regular Expressions, from your Tablet, cell phone or computer.

The program's teaching staff includes professionals from sector 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 academic year For this purpose, the student will be assisted by an innovative interactive video system created by renowned and experienced experts.

02

Objectives

The final objective of this Postgraduate Certificate in Data Analysis and Processing is that the student acquires a precise up-to-date knowledge in this area. An up-to-date approach that will allow the student to perform their work with the highest possible quality and efficiency. All this, thanks to TECH and a 100% online format that gives total freedom of organization and schedules to the student.

Delves into all the essentials of Web Page Data Collection and Storage, without leaving home and without the need for travel"

General Objectives

- Apply their knowledge to their work or vocation in a professional manner and possess the skills that are usually demonstrated through the development and defense of arguments and problem solving within their area of study
- Perform basic operations related to information debugging
- Use the appropriate sources of information for each type of applied study
- Describe the main sources of aggregate output growth of an economy in the long run
- Calculate and use elasticities and cost-of-living indexes

Exceed your most demanding expectations, thanks to a complete program with the most comprehensive theoretical and practical materials on the academic market"

Specific Objectives

- Understand computer algorithms used to manage databases and SQL language
- Critically evaluate the work performed using quality criteria
- Manage a database
- Correctly identify types of data and measures
- Identify the advantages and disadvantages of the Internet as an important source of statistical information
- Possess and understand knowledge in their field of study that builds on the foundation of general secondary education. While relying on advanced textbooks, it also includes some aspects that involve knowledge from the forefront of this field of study
- Define what exploratory data analysis (EDA) is and what its objectives are
- Indicate the steps to be followed in conducting an EDA
- Select the appropriate graphical and numerical methods for examining data characteristics and/or relationships of interest
- Check if some hypotheses of interest are verified in the data (normality, linearity, homoscedasticity)
- Identify univariate, bivariate and multivariate outliers
- Understand the different types of missing data and assess their potential impact

03

Structure and Content

The structure and all the didactic resources of this syllabus have been designed by the renowned professionals that make up TECH's team of experts in this area of engineering. These specialists have used their extensive experience and their most advanced knowledge to create practical and completely up-to-date contents. All this, based on the most efficient teaching methodology, TECH's Relearning.

Expand your knowledge of Statistics Applied to Economics, thanks to the most innovative teaching materials and a wide variety of additional content available on the Virtual Campus"

Module 1. Databases: Design and Management

1.1. Introduction to Databases
- 1.1.1. What is a Database?
- 1.1.2. History of Database Systems

1.2. Information System and Databases
- 1.2.1. Concepts
- 1.2.2. Features
- 1.2.3. Evolution of Databases

1.3. Definition and Characteristics of a Database Management System
- 1.3.1. Definition
- 1.3.2. Features

1.4. Architecture of Database Management Systems
- 1.4.1. Centralized and Client-Server Architectures
- 1.4.2. Server Systems Architectures
- 1.4.3. Parallel Systems
- 1.4.4. Distributed Systems
- 1.4.5. Types of Networks

1.5. Main Database Management Systems
- 1.5.1. Types of DBMS

1.6. Development of Database Applications
- 1.6.1. Web Interfaces for Databases
- 1.6.2. Performance Tuning
- 1.6.3. Performance Testing
- 1.6.4. Standardization
- 1.6.5. E-Commerce
- 1.6.6. Inherited Systems

1.7. Database Design Stages
- 1.7.1. Conceptual Design
- 1.7.2. Logical Design
- 1.7.3. Application Design

1.8. Database Implementation
- 1.8.1. Structured Query Language (SQL)
- 1.8.2. Data Processing
- 1.8.3. Data Query
- 1.8.4. SQL Database Management
- 1.8.5. Working with SQLite Databases

1.9. Notions of HTML and Regular Expressions
- 1.9.1. Structure and Code of a Web Page
- 1.9.2. HTML and CSS Tags and Attributes
- 1.9.3. Text Searching with Regular Expressions
- 1.9.4. Special Characters, Sets, Groups and Repetitions

1.10. Collecting and Storing Data from Web Pages
- 1.10.1. Introduction to Web Scraping Tools
- 1.10.2. Programming Web Scraping Tools in Python
- 1.10.3. Searching and Obtaining Information with Regular Expressions
- 1.10.4. Searching and Obtaining Information with Beautiful Soup
- 1.10.5. Storing in Databases
- 1.10.6. Exporting Results in Comma-Separated Value Files

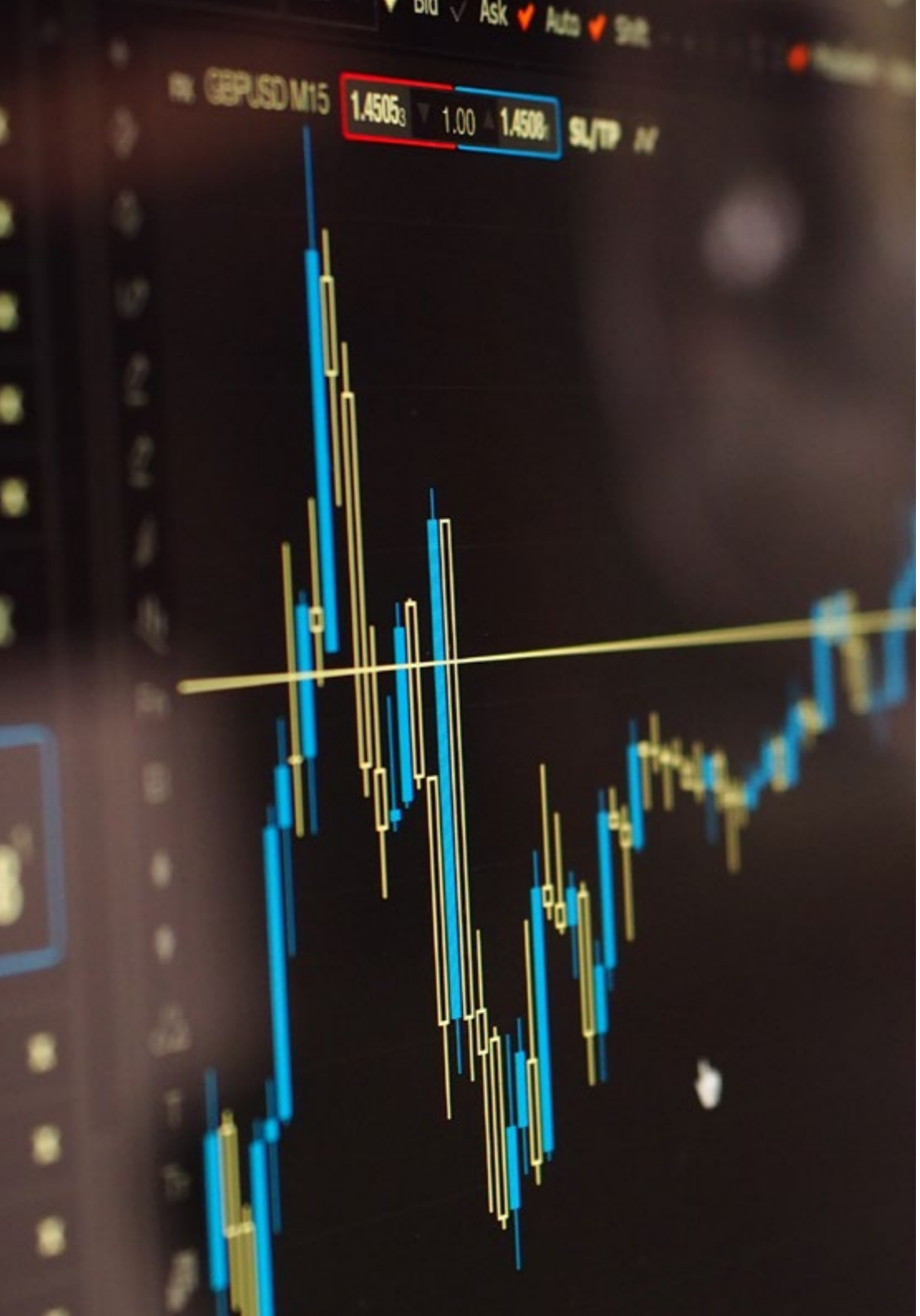
Module 2. Data Analysis and Debugging

2.1. Data Files: Encoding and Transformation
- 2.1.1. Data Coding
- 2.1.2. Data Transformation

2.2. Data Integrity Control: Univariate Study
- 2.2.1. Models
- 2.2.2. Properties

2.3. Data Integrity Control: Bivariate Study
- 2.3.1. Models
- 2.3.2. Properties

2.4. Data Integrity Control: Multivariate Study
- 2.4.1. Models
- 2.4.2. Properties



2.5. Missing Value Detection
  2.5.1. Missing Data Problems
2.6. Treatment of Missing Values
  2.6.1. Missing Value Analysis
2.7. Imputation of Missing Values
  2.7.1. Imputation of Missing Values in One-Dimensional Variables
  2.7.2. Multiple Imputation Methods
2.8. Normality Tests for the Assessment of Starting Assumptions for Data Analysis
  2.8.1. Types of Tests
  2.8.2. Examples
2.9. Homoscedasticity Tests for the Assessment of Starting Assumptions for Data Analysis
  2.9.1. Types of Tests
  2.9.2. Examples
2.10. Independence Tests for the Assessment of Starting Assumptions for Data Analysis
  2.10.1. Types of Tests
  2.10.2. Examples

Thanks to TECH Relearning methodology, you will be able to acquire new knowledge in a precise and natural way, without spending too much time studying"

04

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 is the most widely used learning system in the best faculties in the world. 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 program, the studies 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

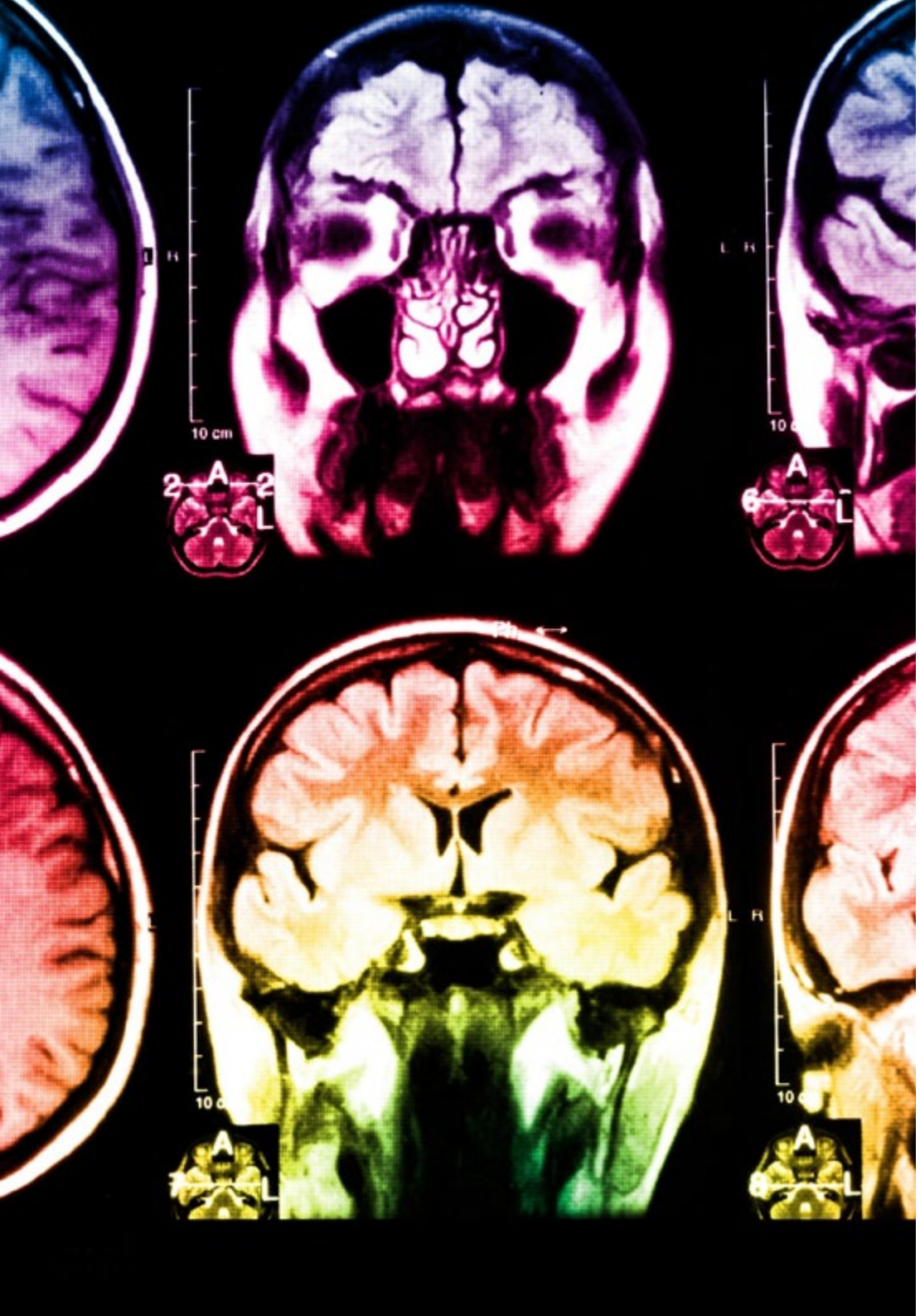
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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.

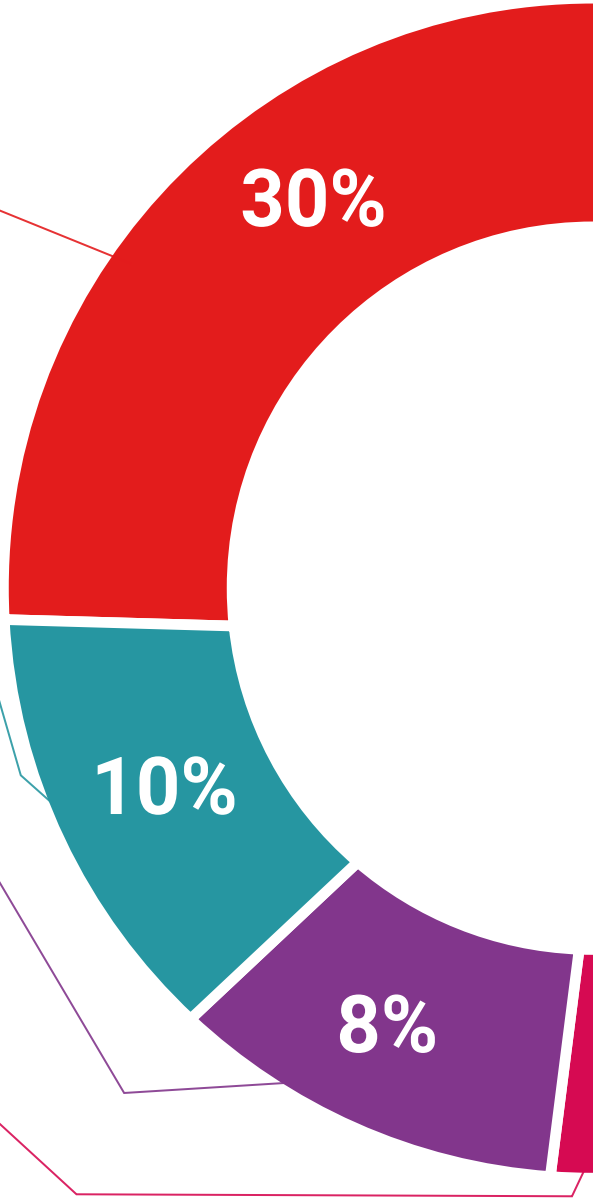
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

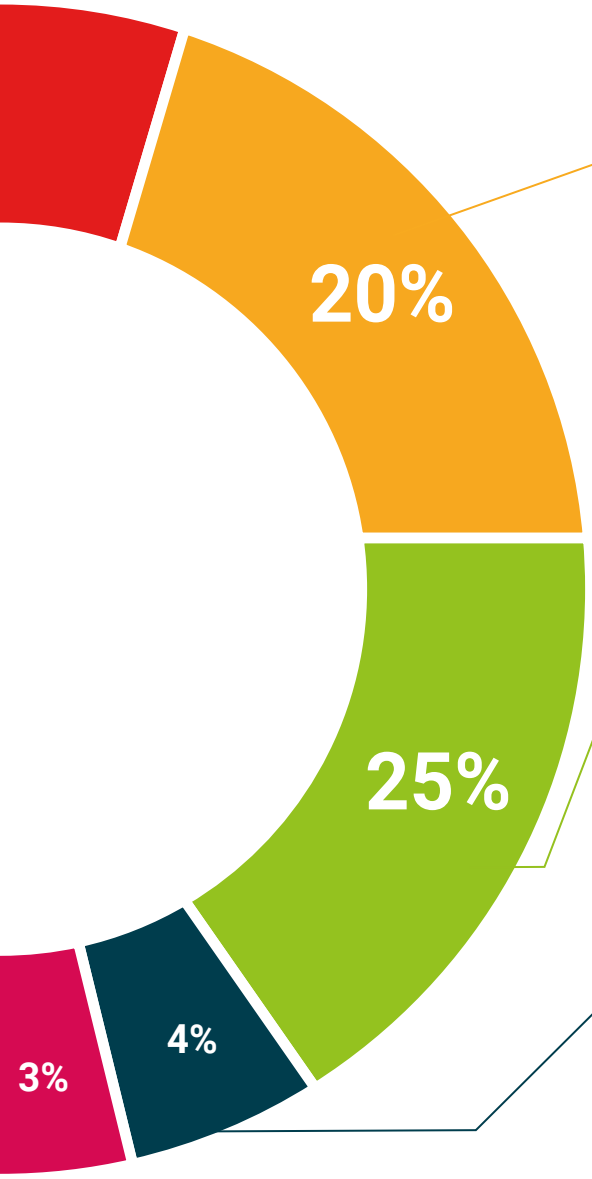
Practising Skills and Abilities

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.

05

Certificate

The Postgraduate Certificate in Data Analysis and Processing guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.

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

This program will allow you to obtain your **Postgraduate Certificate in Data Analysis and Processing** 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.

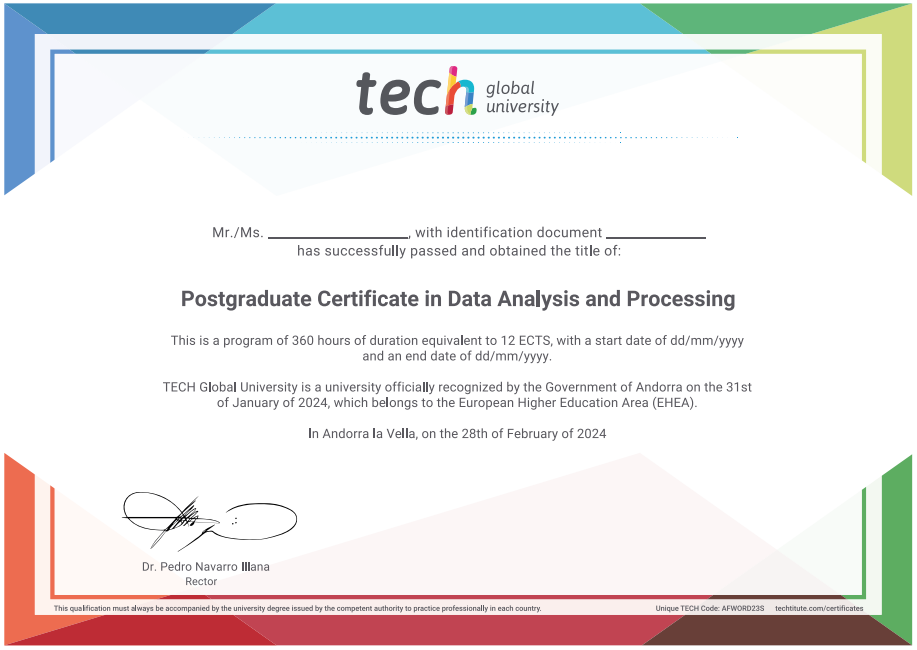
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Data Analysis and Processing**

Modality: **online**

Duration: **12 weeks**

Accreditation: **12 ECTS**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Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Certificate in Data Analysis and Processing

This is a program of 360 hours of duration equivalent to 12 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
Rector

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 diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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