

# Postgraduate Certificate Tools in Data Science



## Postgraduate Certificate Tools in Data Science

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

Website: [www.techtute.com/pk/information-technology/postgraduate-certificate/tools-data-science](http://www.techtute.com/pk/information-technology/postgraduate-certificate/tools-data-science)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 16*

05

Methodology

---

*p. 20*

06

Certificate

---

*p. 28*

# 01

# Introduction

One of the main tasks of *Data Science* specialists is to ensure the conversion of data into useful knowledge for a company. And specific tools must be used to help in this task. This program will facilitate students in analyzing data, visualizing sets and drawing conclusions about the preprocessing required before modeling and how it influences the results obtained. Case studies will also be provided to support learning at all times.



“

*Determine the characteristics of a Dataset, analyzing it and interpreting the necessary preprocessing to be performed”*

This Postgraduate Certificate will present specialized knowledge about the tools used in Data Science to extract and analyze company information. This work is essential for the professional development of computer engineers who wish to provide realistic solutions to daily problems in their work environment.

Moreover, upon completing the program, students will be able to develop a critical thinking in face of the applied strategies, being able to discern in each case the most appropriate solution and explain, in a reasoned way, the results obtained in the different metrics.

The entire program is comprised of a series of case studies that will help computer engineers who are looking to advance their careers and challenge themselves to achieve excellence.

This **Postgraduate Certificate in Tools 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
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*Transform data into information,  
adding value and enabling the  
generation of new knowledge”*



“*Generate hypotheses to solve practical cases and validate them using metrics in a critical and reasoned manner*”

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.

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. This will be done with the help of an innovative, interactive video system developed by renowned experts with extensive experience using the Tools in Data Science.

*Develop the skills to convert data into information from which knowledge can be extracted.*

*Analyze the most appropriate techniques for each data set and examine the results obtained.*

```
...UTTON.BUTTON  
...UTTON.PAINT()  
...  
* THIS IS JUST FOR THE S...  
* WITH ABSTRACT FACTOR...  
* @RETURN  
*  
PUBLIC STATIC STRING ...  
FINAL STRING @ APPEAR...  
APPEARANCEARRAY[] ...  
APPEARANCEARRAY[] ...  
APPEARANCEARRAY[] ...  
FINAL JAVA UTIL_RAND...
```

# 02 Objectives

The knowledge provided on this program will help computer engineers develop critical thinking skills when performing a data analysis strategy, which enable them to find an appropriate solution to the problems presented. To that end, TECH has established the following general and specific objectives:







“

*For an IT engineer, it is essential to use critical thinking in order to choose a tool that suits company needs”*



## 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



*This program will prove to be the right alternative to continue your academic training"*





## Specific Objectives

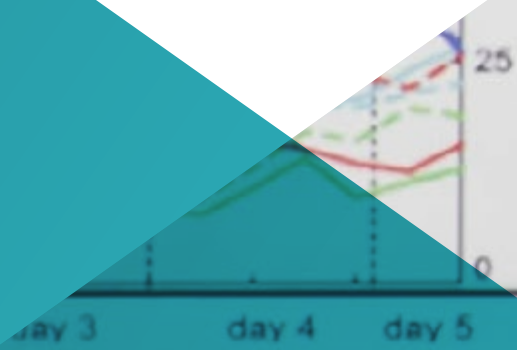
---

- ◆ Develop the skills to convert data into information from which knowledge can be extracted
- ◆ Determine the main features of a *dataset*, its structure, components and the implications of its distribution in the modeling
- ◆ Support decision-making by performing comprehensive data analysis in advance
- ◆ Develop skills to solve practical cases using data science techniques
- ◆ Establish the most appropriate general tools and methods for modeling each *Dataset* based on the preprocessing performed
- ◆ Evaluate the results in an analytical way, understanding the impact of the chosen strategy on the various metrics
- ◆ Demonstrate critical analysis of the results obtained after applying preprocessing or modeling methods

# 03

# Course Management

The Postgraduate Certificate in Tools 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 staff is specialized in Data Science and the latest tools used in data analysis”*



## Management



### Dr. Peralta Martín-Palomino, Arturo

- ♦ CEO and CTO at Prometheus 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. Pedrajas Parabás, Elena

- ◆ Business Analyst in Management Solutions in Madrid
- ◆ Collaborator with the Department of Numerical Analysis at the University of Cordoba Professional Experience
- ◆ Researcher in the Department of Computer Science and Numerical Analysis at the University of Cordoba
- ◆ Researcher at the Singular Center for Research in Intelligent Technologies in Santiago de Compostela
- ◆ Degree in Computer Engineering Master's Degree in Data Science and Computer Engineering Teaching Experience

“

*An excellent teaching staff  
for professionals who want to  
improve in their career”*

# 04

# Structure and Content

The syllabus provides a theoretical perspective on the most advanced techniques that have served as a basis for analyzing, visualizing and extracting important company data. This will be made possible by means of a series of case studies that will illustrate the course contents. Consequently, the objectives of the program to train professional, integral and prestigious engineers will be fulfilled.



“

*Evaluate the results in an analytical way,  
understanding the impact of the chosen  
strategy on the various metrics”*



## Module 1. Data Science Tools

- 1.1. Data Science
  - 1.1.1. Data Science
  - 1.1.2. Advanced Tools for Data Scientists
- 1.2. Data, Information and Knowledge
  - 1.2.1. Data, Information and Knowledge
  - 1.2.2. Types of Data
  - 1.2.3. Data Sources
- 1.3. From Data to Information
  - 1.3.1. Data Analysis
  - 1.3.2. Types of Analysis
  - 1.3.3. Extraction of Information from a *Dataset*
- 1.4. Extraction of Information Through Visualization
  - 1.4.1. Visualization as an Analysis Tool
  - 1.4.2. Visualization Methods
  - 1.4.3. Visualization of a Data Set
- 1.5. Data Quality
  - 1.5.1. Quality Data
  - 1.5.2. Data Cleaning
  - 1.5.3. Basic Data Pre-Processing
- 1.6. *Dataset*
  - 1.6.1. *Dataset* Enrichment
  - 1.6.2. The Curse of Dimensionality
  - 1.6.3. Modification of Our Data Set
- 1.7. Unbalance
  - 1.7.1. Classes of Unbalance
  - 1.7.2. Unbalance Mitigation Techniques
  - 1.7.3. Balancing a *Dataset*







- 1.8. Unsupervised Models
  - 1.8.1. Unsupervised Model
  - 1.8.2. Methods
  - 1.8.3. Classification with Unsupervised Models
- 1.9. Supervised Models
  - 1.9.1. Supervised Model
  - 1.9.2. Methods
  - 1.9.3. Classification with Supervised Models
- 1.10. Tools and Good Practices
  - 1.10.1. Good Practices for Data Scientists
  - 1.10.2. The Best Model
  - 1.10.3. Useful Tools

“ With this program, you will be able to develop a series of indispensable skills for industrial engineers specialized in this field”

# 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 Tools 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 Tools 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 the requirements commonly demanded by job markets, competitive examinations and professional career evaluation committees.

Title: **Postgraduate Certificate in Tools in Data Science**

Official N° of Hours: **150 h.**



\*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.

health future  
confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present quality  
development languages  
classroom



## Postgraduate Certificate Tools in Data Science

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

# Postgraduate Certificate Tools in Data Science