

# Postgraduate Certificate

Graphical Representations of Data  
in Medical Research and Other  
Advanced Analysis



## Postgraduate Certificate Graphical Representations of Data in Medical Research and Other Advanced Analysis

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

Website: [www.techtute.com/in/dentistry/postgraduate-certificate/graphical-representations-data-medical-research-other-advanced-analysis](http://www.techtute.com/in/dentistry/postgraduate-certificate/graphical-representations-data-medical-research-other-advanced-analysis)

# 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

Graphical representations of data provide great advantages to dental research. They make it possible to detect patterns and relationships that may be difficult to identify in raw data or in text form thanks to tools such as scatter plots. This is why it is important for dental professionals to continually update themselves in this aspect in order to facilitate the readability and interpretation of their research, which is why this program was created. Through it, the student will go through the types of graphics and other advanced analyses, delving into the comparison of methods and how to reduce dimensionality. All this based on an attractive online format and managing your own academic time.





*Thanks to this Postgraduate Certificate you will master the most advanced graphical data representation tools for your research"*

There is no doubt that graphical representations of data allow a more effective communication of research results. Graphics and tables are much easier to understand for the general public than verbal or numerical descriptions of the results, facilitating also a quicker interpretation of the research by other scientists. In addition, data visualization helps to present arguments more persuasively.

However, poorly designed graphics tend to be confusing or even misleading, which can lead to incorrect conclusions. To prevent dental professionals from making these mistakes and to improve their handling of graphic representation, this Postgraduate Certificate will take their research to a new level, making it more attractive in terms of visualization.

Therefore, students will analyze in detail the existing types of graphics and the best strategies to reduce dimensionality, comparing the PCA, PPCA and KPCA methods. Students will also delve into the analysis of massive data or binary Regression models.

Without the need to adapt to preset schedules, students will have everything they need in the Virtual Campus. To access it, they will only need a device with Internet connection, which will allow them to enjoy a high level of preparation in Graphical Representations of Data in Medical Research and other Advanced Analyses, a reference in the market with multiple resources.

This **Postgraduate Certificate in Graphical Representations of Data in Medical Research and Other Advanced Analysis** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ The development of case studies presented by experts in Graphical Representations of Data in Medical Research and other Advanced Analysis
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and 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



*If you want to go further into the most effective methods to reduce dimensionality in data, this is the degree for you"*

“

*150 hours of academic training with a pioneering study methodology with which, through repetition, you will establish the differences between the PCA, PPCA and KPCA methods”*

*Get up-to-date in the application of ROC Curves to your research.*

*An essential Postgraduate Certificate to handle multivariate analysis with solvency by means of advanced practical cases.*

The program's teaching staff includes professionals in the field who contribute their work experience to this degree 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.

The design of this program focuses on Problem-Based Learning, by means of which the professional must try to solve the different professional practice situations that are presented throughout the academic course. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.



# 02 Objectives

This program aims to provide a valuable update of knowledge in Graphical Representations of Data in Medical Research and other Advanced Analysis to the dental professional. To this end, TECH offers the latest and most advanced tools to develop your research praxis with all guarantees and always backed by scientific evidence. You will do so thanks to a global approach that will prepare you to face any challenging scenario when it comes to graphically represent data in complex investigations.







“

*Achieve the objectives of the Postgraduate Certificate to handle with ease any type of graphics in your research”*



## General Objectives

---

- Understand the appropriate approach to a question or problem to be solved
- Assess the state of the art of the problem through literature search
- Assess the feasibility of the potential project
- Study the drafting of a project in accordance with the different calls for proposals
- Examine the search for funding
- Master the necessary data analysis tools
- Write scientific articles (papers) for the daily magazines
- Generate posters relevant to the topics addressed
- Know the tools for dissemination to the non-specialized public
- Delve into data protection
- Understand the transfer of knowledge generated to industry or the clinic
- Examine the current use of artificial intelligence and massive data analysis
- Study examples of successful projects





## Specific Objectives

---

- Obtain in-depth knowledge of dimensionality reduction methods
- Delve into the comparison of methods

“

*Reach any goal you set for your dental research by perfecting the graphic communication of your research to the public and the scientific community”*

# 03

## Course Management

In this program, TECH has opted for a solid teaching team of great professionals who have demonstrated a meritorious research background. In this sense, the faculty is made up of experts who lead prestigious research institutions and who skillfully develop graphical representations of data so that their results can be interpreted more easily. In addition, they will be available to answer any questions students may have through the Virtual Campus.





“

*Experts who have led prestigious research institutions will solve all the doubts you may have throughout your educational cycle”*

## Management



### Dr. López-Collazo, Eduardo

- ♦ Scientific Deputy Director in the Institute for Health Research the Health Research Institute of La Paz University Hospital
- ♦ Head of the Department of Immune Response and Infectious Diseases at IdiPAZ
- ♦ Head of the Department of Immune Response, Tumors and Immunology at IdiPAZ
- ♦ President of the IdiPAZ Research Commission
- ♦ Sponsor of the External Scientific Committee of the Murcian Institute of Health Research.
- ♦ Member of the Scientific Commission of FIDE
- ♦ Editor of the international scientific journal Mediators of Inflammation
- ♦ Editor of the international scientific journal "Frontiers of Immunology"
- ♦ Coordinator of IdiPAZ Platforms
- ♦ Coordinator of Health Research Funds in the areas of Cancer, Infectious Diseases and HIV
- ♦ PhD in Nuclear Physics, University of La Habana
- ♦ Doctorate in Pharmacy from the Complutense University of Madrid



## Professors

### Dr. Avendaño Ortiz, José

- ♦ Sara Borrell Researcher Foundation for Biomedical Research of the Ramón y Cajal University Hospital (FIBioHRC/IRyCIS)
- ♦ Researcher Foundation for Biomedical Research of La Paz University Hospital (FIBHULP/ IdiPAZ)
- ♦ Researcher HM Hospitals Foundation (FIHM)
- ♦ Graduate in Biomedical Sciences from the University of Lleida
- ♦ Master's Degree in pharmacological research from the Autonomous University of Madrid
- ♦ PhD in Pharmacology and Physiology from the Autonomous University of Madrid

### Dr. Pascual Iglesias, Alejandro

- ♦ Bioinformatics Platform Coordinator, La Paz Hospital
- ♦ Advisor to the COVID-19 Expert Committee of Extremadura
- ♦ Researcher in Eduardo López-Collazo's innate immune response research group, Instituto de Investigación Sanitarias University Hospital La Paz
- ♦ Researcher in the coronavirus research group of Luis Enjuanes, National Center of Biotechnology CNB-CSIC
- ♦ Coordinator of Continuing Education in Bioinformatics, Health Research Institute of the University Hospital La Paz
- ♦ Cum Laude Doctor in Molecular Biosciences from the Autonomous University of Madrid
- ♦ Degree in Biology Molecular from the University of Salamanca
- ♦ Professional Master's Degree in Cellular and Molecular Physiopathology and Pharmacology from the Universidad of Salamanca

04

# Structure and Content

The syllabus has been meticulously designed with the needs of the students in mind. This has been done from a double perspective. On the one hand, the syllabus addresses the essential elements so that all the keys to Graphical Representations of Data in Medical Research and other Advanced Analysis are present in the contents. On the other hand, TECH has opted for an extremely flexible format that will allow the dentist to combine it with his professional activity without any problems.



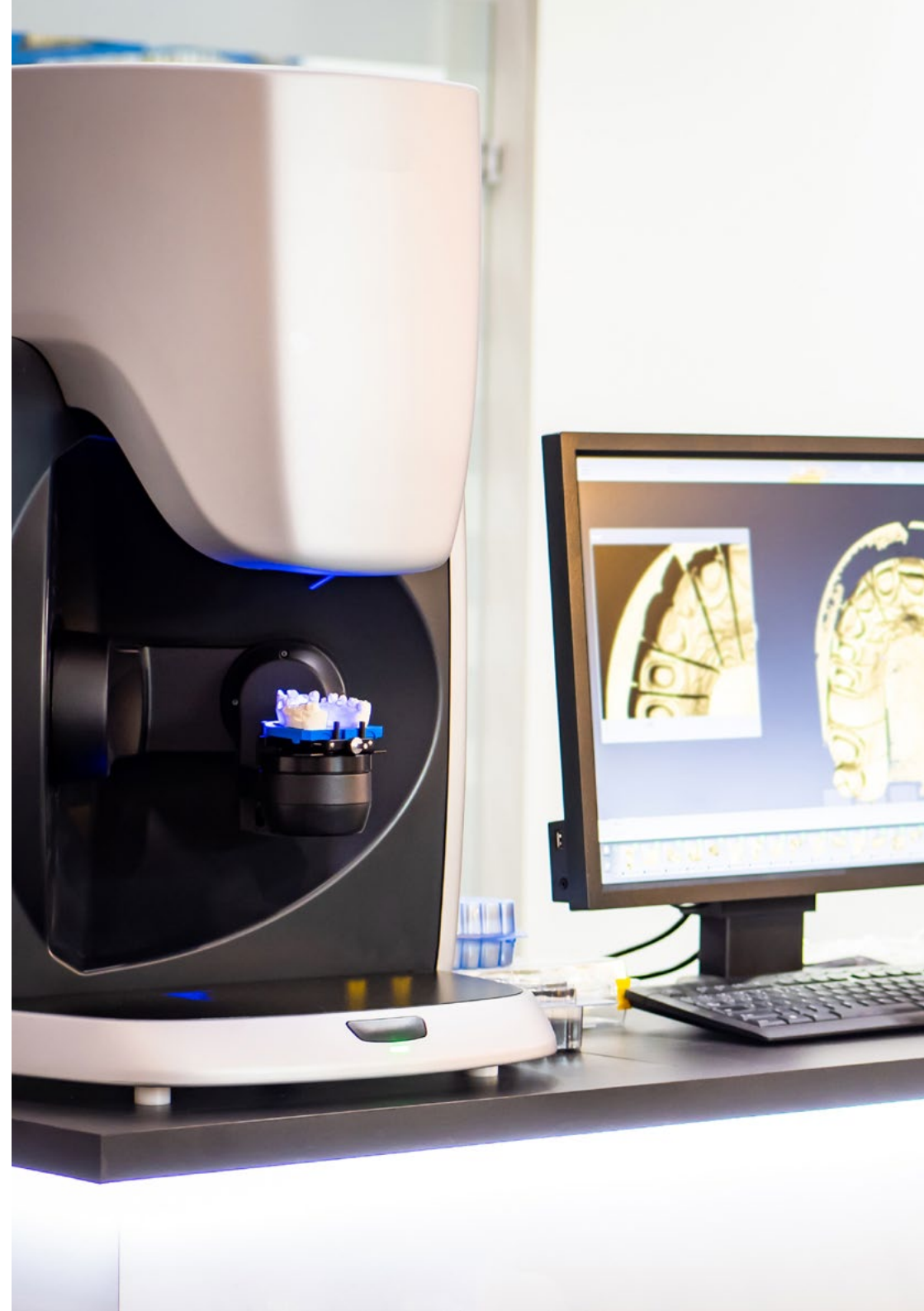


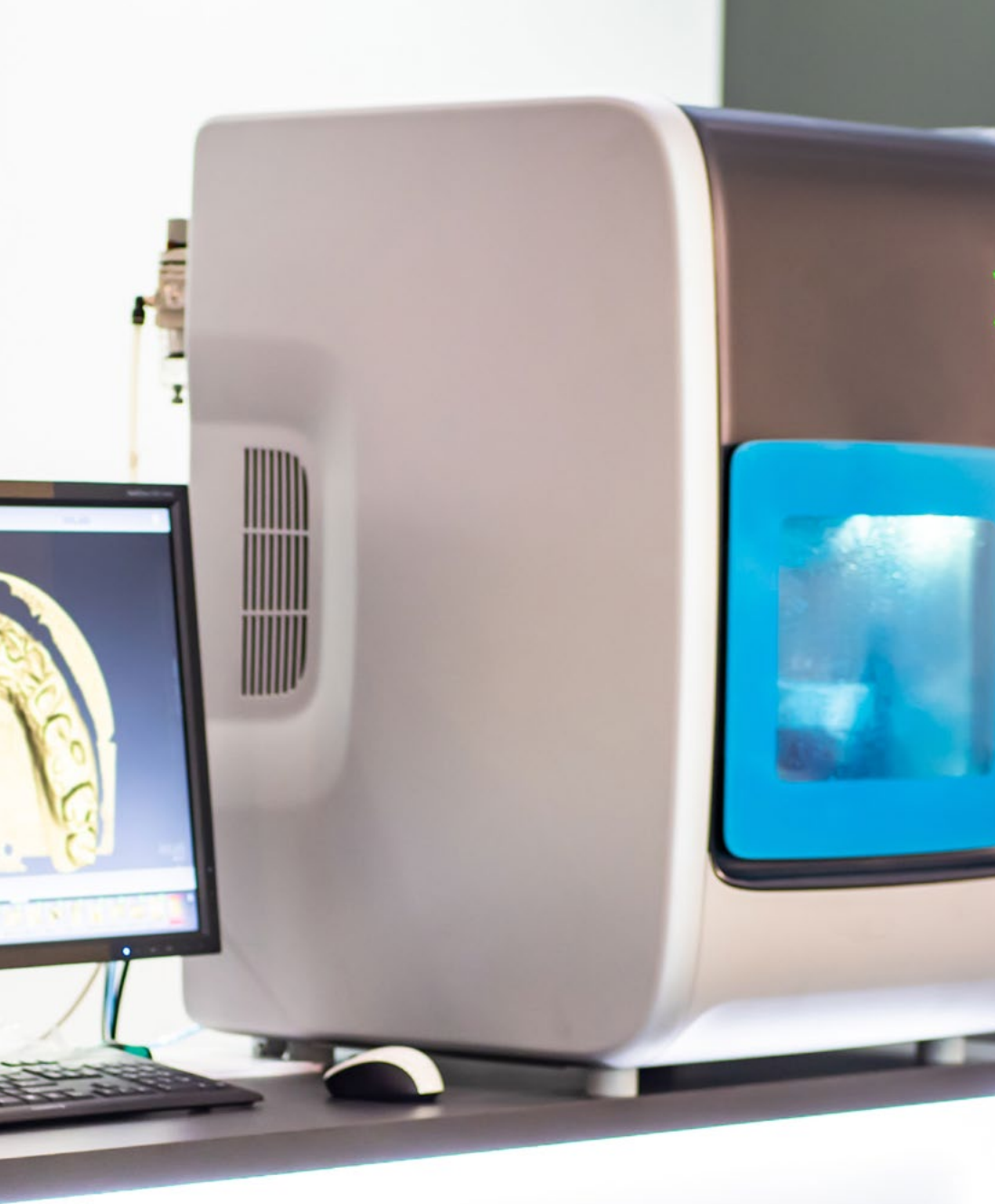
“

*Only 6 weeks is the time TECH requires to turn you into a researcher with advanced strategies for data graphing”*

**Module 1.** Graphical Representations of Data in Medical Research and Other Advanced Analysis

- 1.1. Types of Graphs
- 1.2. Survival Analysis
- 1.3. ROC Curves
- 1.4. Multivariate Analysis (Types of Multiple Regression)
- 1.5. Binary Regression Models
- 1.6. Massive Data Analysis
- 1.7. Dimensionality Reduction Methods
- 1.8. Comparison of Methods: PCA, PPCA and KPCA
- 1.9. T-SNE (t-Distributed Stochastic Neighbor Embedding)
- 1.10. UMAP (Uniform Manifold Approximation and Projection)





“

*UMAP, T-SNE, survival analysis... All the fundamental concepts of Graphical Representations of Data in Medical Research and other Advanced Analysis can be found here”*

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"*

## At TECH we use the Case Method

In a given situation, what should a professional do? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Specialists learn better, faster, and more sustainably over time.

*With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.*



According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions in the dentist's professional practice.

“

*Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method”*

The effectiveness of the method is justified by four fundamental achievements:

1. Dentists who follow this method not only grasp concepts, but also develop their mental capacity by means of exercises to evaluate real situations and apply their knowledge.
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real world.
3. Ideas and concepts are understood more efficiently, given that the example situations are based on real-life.
4. Students like to feel that the effort they put into their studies is worthwhile. This then translates into a greater interest in learning and more time dedicated to working on the course.



## Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: *Relearning*.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

*The student will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.*





At the forefront of world teaching, the *Relearning* method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology we have trained more than 115,000 dentists with unprecedented success, in all specialties regardless of the workload. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

*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.*

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.

The overall score obtained by TECH's learning system is 8.01, according to the highest international standards.



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.



### Educational Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances, and to the forefront of medical techniques. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch the videos as many times as you like.



### 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".



### 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.





#### Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



#### 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.



#### 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.



#### Quick Action Guides

TECH offers the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help students progress in their learning.



06

# Certificate

The Postgraduate Certificate in Graphical Representations of Data in Medical Research and Other Advanced Analysis 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”*

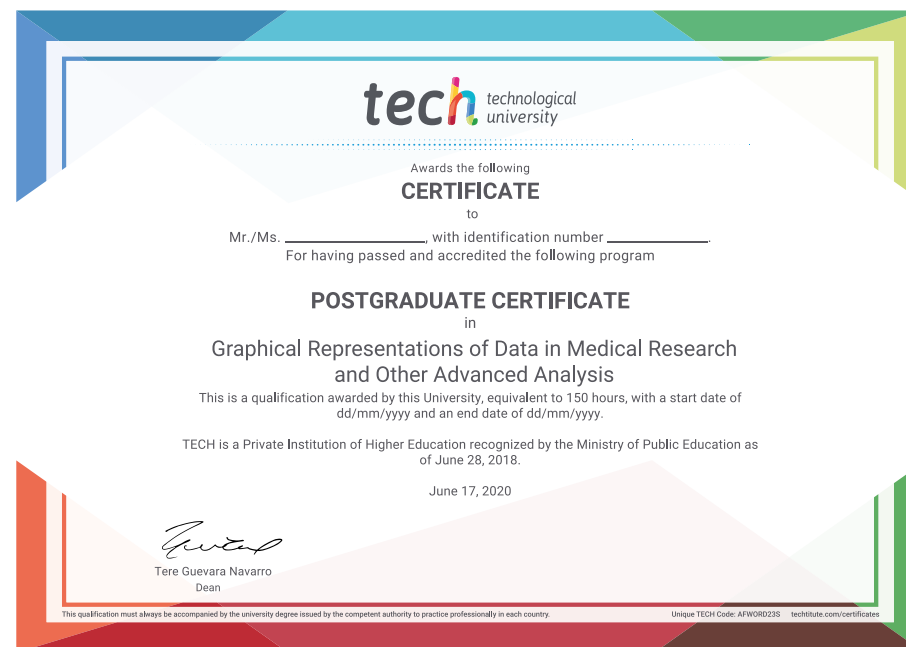
This **Postgraduate Certificate in Graphical Representations of Data in Medical Research and Other Advanced Analysis** contains the most complete and up-to-date scientific on the market.

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 labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Graphical Representations of Data in Medical Research and Other Advanced Analysis**

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.

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



## Postgraduate Certificate

### Graphical Representations of Data in Medical Research and Other Advanced Analysis

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

# Postgraduate Certificate

Graphical Representations of Data  
in Medical Research and Other  
Advanced Analysis

