



# 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/us/medicine/postgraduate-certificate/graphical-representations-data-medical-research-other-advanced-analysis](http://www.techtute.com/us/medicine/postgraduate-certificate/graphical-representations-data-medical-research-other-advanced-analysis)

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# 01

# Introduction

Graphical representations are one of the star tools of scientific research, since they make it possible to convert illegible data into easily understandable visual information. This system is part of the last phase of the project, that of dissemination and disclosure, since the data, without being applied, would be useless for the purpose of the study. Therefore, public and private companies that invest in clinical trials need specialists who have mastered all the latest techniques and strategies in terms of advanced analysis to promote progress in medicine. For this reason, TECH's team of experts in Medical Research has developed an intensive program that addresses the latest developments related to graphic representation and its application in the scientific field. Graduates will have a 100% online degree that will allow them to combine their studies with the rest of their lives.





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*Would you like to get up to date on graphical representations of data in healthcare research? Enroll now in this TECH Postgraduate Certificate to achieve it”*

The truth is that, without adequate representation, advances in research would be incomprehensible. For this reason, specialists in this field must broaden their skills and orient their careers towards multidisciplinary action, applying the latest tools that have shown the greatest success in scientific evidence. Graphics are one of the systems that help to convey information and convert it into readable data at a glance.

This is the reason why TECH has designed a rigorous and specific Postgraduate Certificate on the graphical representation of data in Health Research and other advanced analyses. It is a 6-week program that includes 150 hours of syllabus, simulation of real cases and additional material. Thanks to this, the physician will be able to delve into the novelties of dimensionality reduction methods, the comparison between PCA, PPCA and KPCA, massive data analysis and binary models, among other aspects.

All this, through a 100% online degree that allows the adaptation of the study to the personal and professional needs of students, whatever their situation. In this way, with only an electronic device and an Internet connection, the specialist will be able to access the subject matter from wherever he/she wishes. In addition, all the content will be available for download from the beginning of the course, so that the professional can keep the information on his or her device and consult it even at the end of the course.

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

- ◆ Development of case studies presented by experts in Medical Research
- ◆ 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



*A perfect opportunity to delve into dimensionality reduction methods from wherever you are, with no travel or fixed schedules”*

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*You will be able to get up to date on ROC Curves, thanks to the exhaustiveness with which each of the sections of the syllabus has been developed”*

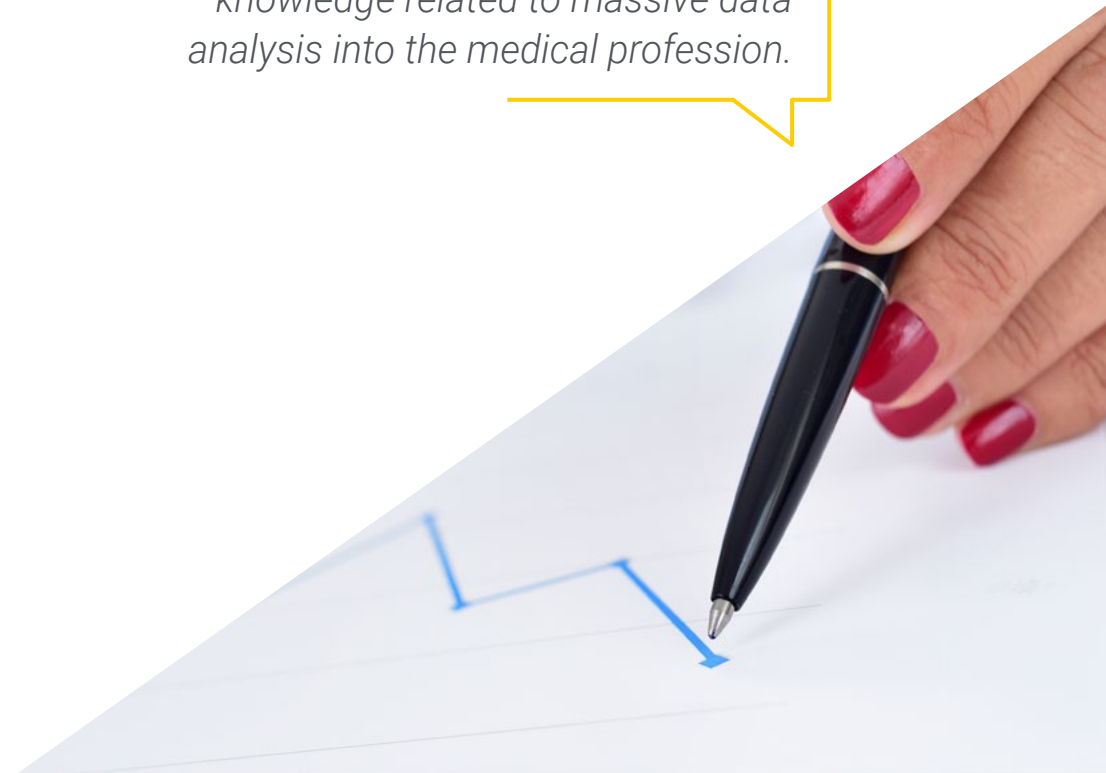
The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its 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 an 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 student will be assisted by an innovative interactive video system created by renowned experts.

*In the Online Campus you will find 150 hours of additional high quality material for you to acquire all the knowledge and apply it in your professional practice.*

*TECH offers a dynamic way to incorporate the most up-to-date knowledge related to massive data analysis into the medical profession.*



# 02 Objectives

The main objective of this Postgraduate Certificate in Graphical Representations of Data in Medical Research and other Advanced Analyses is to update the knowledge of graduates in Medicine and other health professionals interested in the representation of their scientific results. For this reason, TECH offers the most innovative and complete information, so that students can practice based on the most recent scientific evidence in the sector, mastering the tools of computational statistics







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*Delve into the comparison of methods and understand how Collaborative Research has gained great importance in medical advances from history to the present day”*



## General Objectives

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- ◆ 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

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- ◆ Master the tools of computational statistics
- ◆ Learn to generate graphs for the visual interpretation of data obtained in research project
- ◆ Obtain in-depth knowledge of dimensionality reduction methods
- ◆ Delve into the comparison of methods



*Do you want to achieve your goals in a simple and guaranteed way? TECH is the right place to develop with professionals who are dedicated to the research sector. Enroll now and see for yourself"*

# 03

# Course Management

In order to develop this Postgraduate Certificate under the rigor that TECH pursues, the University has selected an experienced group of teachers, not only based on their academic and professional curriculum, but also on the human quality they demonstrate. It is a team that has its own research in the areas of Cancer, Infectious Diseases and HIV, among others. In addition, they are currently holding important positions in scientific research in prestigious public hospitals. This is a unique opportunity for those specialists who wish to have as an example experts who work in the field on a daily basis.





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*You will have theoretical knowledge, but also the practical keys to research work in the real scenario thanks to the teaching team that TECH puts at your disposal”*

## 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

TECH has incorporated the most innovative pedagogical tools in all its programs. In addition, it has incorporated the innovative Relearning methodology, to relieve students of long hours of memorization and allow them to assimilate the contents in a simple and gradual manner. In this way, the Technological University guarantees a dynamic and multidisciplinary academic experience, in which you will be able to catch up thanks to an enriching and 100% online program.





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*It has 150 hours of audiovisual materials in various formats so that you can explore the agenda with all the facilities from wherever you choose”*

**Module 1.** Graphical Representations of Data in Health 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 Stochastic Neighbor Embedding)
- 1.10. UMAP (Uniform Manifold Approximation and Projection)





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*Enroll now and join a unique program to update your skills in medical practice and promote the successful graphic representation of your research”*



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"*

## At TECH we use the Case Method

What should a professional do in a given situation? 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 physician's professional practice.

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*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. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate real situations and the application of 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.

*Professionals will learn through real cases and by resolving 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, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. 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 specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to 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.



#### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current 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 on the usefulness of learning by observing experts. The system known as 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 Analyses guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.







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

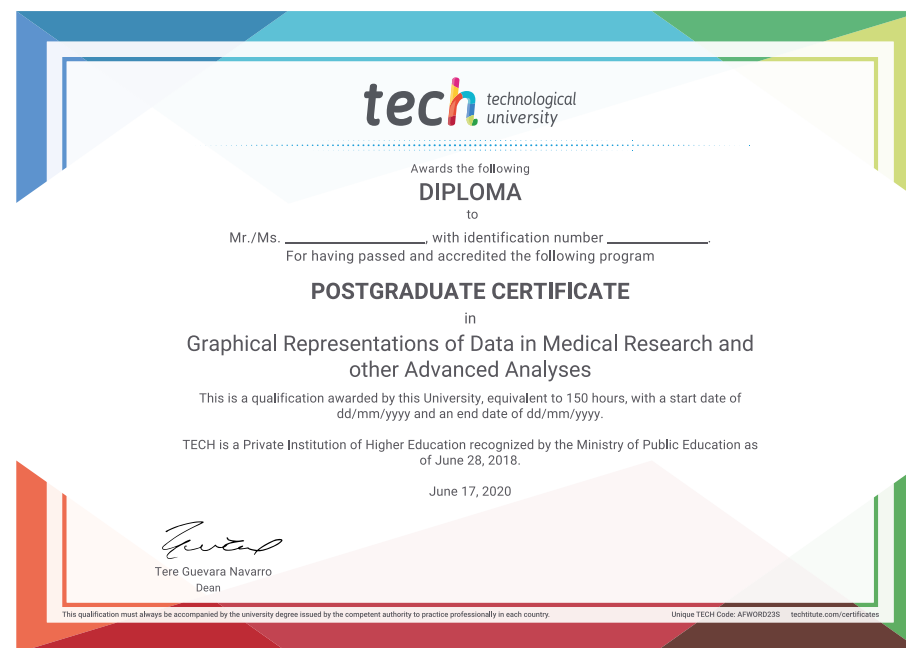
This **Postgraduate Certificate on Graphical Representations of Data in Medical Research and other Advanced Analyses** contains the most complete and up-to-date scientific program on the market.

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

The diploma 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 Analyses**

Official N° of hours: **150 h.**



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



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of Data in Medical Research  
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- » Exams: online

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