

# Postgraduate Certificate

Graphical Representations of  
Data in Medical Research and  
other Advanced Analyses



## Postgraduate Certificate

### Graphical Representations of Data in Medical Research and other Advanced Analyses

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

Website: [www.techtute.com/us/physiotherapy/postgraduate-certificate/graphical-representations-data-medical-research-advanced-analyses](http://www.techtute.com/us/physiotherapy/postgraduate-certificate/graphical-representations-data-medical-research-advanced-analyses)

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# 01

# Introduction

Graphical representations are generally based on the conversion of quantitative data and make it possible to transform technical information into data that can be read with the naked eye. In this way, the specialists have obtained a system of samples that, by means of lines, vectors, surfaces or symbols, manage to express the information of their research in a visual way. It is a tool that promotes the last phase of knowledge transmission in scientific trials, so experts in this area must master all possible graphic representation strategies. To this end, TECH has developed a specific and rigorous program that explores the types of graphs and methods of comparison to update the knowledge of Physiotherapy graduates and other professionals interested in studies related to Health Sciences. A 100% online degree that offers great flexibility to students so that they can combine their studies with other personal or professional activities.



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*With this Postgraduate Certificate you will be up to date on dimensionality reduction methods that promote scientific data conversion performance”*

Statistics is another tool that research experts use for the practical application of their findings. These systems bring great advantages to research projects, since they allow them to offer an overview of the object under investigation in a more direct and perceptible way than that generated by the presentation of numerical data. For this reason, companies are increasingly looking for highly qualified and multidisciplinary professionals to participate in the entire research process with confidence and security.

For this reason, TECH has designed the Postgraduate Certificate in Graphical Representations of Data in Medical Research and other Advanced Analysis. This is a university program taught in 100% online mode, which allows students to enter digitally in a field where, precisely, Statistics, is equipped with technological advances to obtain greater precision. The program also delves into methods for dimensionality reduction, the comparison between PCA, PPCA and KPCA, massive data analysis and binary models, among other issues.

This program is a unique and enriching academic experience that applies the Relearning learning system to relieve students of long hours of memorization and allow for a dynamic adaptation of the pace of study. In addition, TECH has the support of a teaching team trained in the area, whose objective is to impart knowledge and bring their professional experiences to the students. A flexible degree that will provide Physiotherapy graduates with the knowledge to obtain a deep theoretical basis with which to analyze the use of Statistics in their results.

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 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



*TECH will help you master all types of graphs so that you can convert numerical data into visually readable information"*

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*With this Postgraduate Certificate you will distinguish yourself from the rest of the professionals who are dedicated to the research area in Physiotherapy so that you will be more competitive in the labor market”*

The program's teaching staff includes professionals from sector who contribute their work experience to this 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.

This program's design focuses on Problem-Based Learning, through which the professional must try to solve the different professional practice situations that arise during the academic program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

*In the Virtual Campus you will have access to 150 hours of additional high quality material with which you will deepen your knowledge of dimensionality reduction methods in a simple way.*

*You are closer to mastering advanced analytics that foster the development of Health Research, get it with TECH.*



# 02 Objectives

This Postgraduate Certificate in Graphical Representations of Data in Medical Research and other Advanced Analyses has as main objective to update the knowledge of those engaged in Physiotherapy, so that they enter into the representation of their scientific results. In addition, TECH has a professional team that will instruct students perfectly on the students on numerical data conversion keys and their characteristics. In this way, students will have a comprehensive qualification, which focuses on Big Data. This will allow you to become a multi-disciplinary professional and even a more competitive specialist in the labor market.





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*Reach your goal, master the comparison of PCA, PPCA, KPCA methods thanks to a comprehensive and 100% online qualification”*



## General Objectives

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- ◆ Adequately formulate 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
- ◆ Draft projects in accordance with the different calls for proposals
- ◆ Look for A Funding Model
- ◆ Master the necessary data analysis tools
- ◆ Write scientific articles (papers) for the daily magazines
- ◆ Identify the main tools for dissemination to the non-specialized public





## Specific objectives

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

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*Thanks to the new and innovative academic technology that TECH employs in its degrees, you will be able to reach your academic goals in less than 6 weeks”*

03

# Course Management

For TECH it is essential that its students feel confident, so not only does it offer a rigorous program, but it has also selected a group of experts who guarantee its contents. In addition, the specialists will count on them as a teaching figure who will guide them and transmit the keys of information transmission in Research. At the same time, students will be able to contact the professionals through a direct communication life, through the Virtual Campus, with which they will be able to solve all their questions about the subject and debate in relation to the physiotherapeutic field.



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*You can now count on the support of experts in the field of Physiotherapy Research to apply all their advice in your professional performance”*

## Management



### Dr. López-Collazo, Eduardo

- ♦ Deputy Scientific Director at the Healthcare Research Institute of the La Paz University Hospital
- ♦ Head of the Department of Inmune Response and Infectious Diseases at IdiPAZ
- ♦ Head of the Department of Inmune 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

- ◆ Researcher Sara Borrell Biomedical Research Foundation of the Ramon and 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 in Pharmacological Research, 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, Health Research Institute, La Paz University Hospital
- ◆ Researcher in Luis Enjuanes' coronavirus research group at the Biotechnology National Center CNB-CSIC
- ◆ Coordinator of Continuing Education in Bioinformatics at the Health Research Institute of La Paz University Hospital
- ◆ 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 of this Postgraduate Certificate in Graphical Representations of Data in Medical Research and other Advanced Analyses has been developed with the collaboration of specialists with extensive experience in Health Research. The teachers who impart the knowledge of this program endorse the theoretical-practical contents and will guide the pupil in its development, so that, in just 150 hours, manage to master the graphical representation with guarantees of success. In addition, the Relearning methodology applied by TECH is fundamental so that specialists do not have to invest long hours of memorization and can assimilate the contents in a repetitive and easy way.



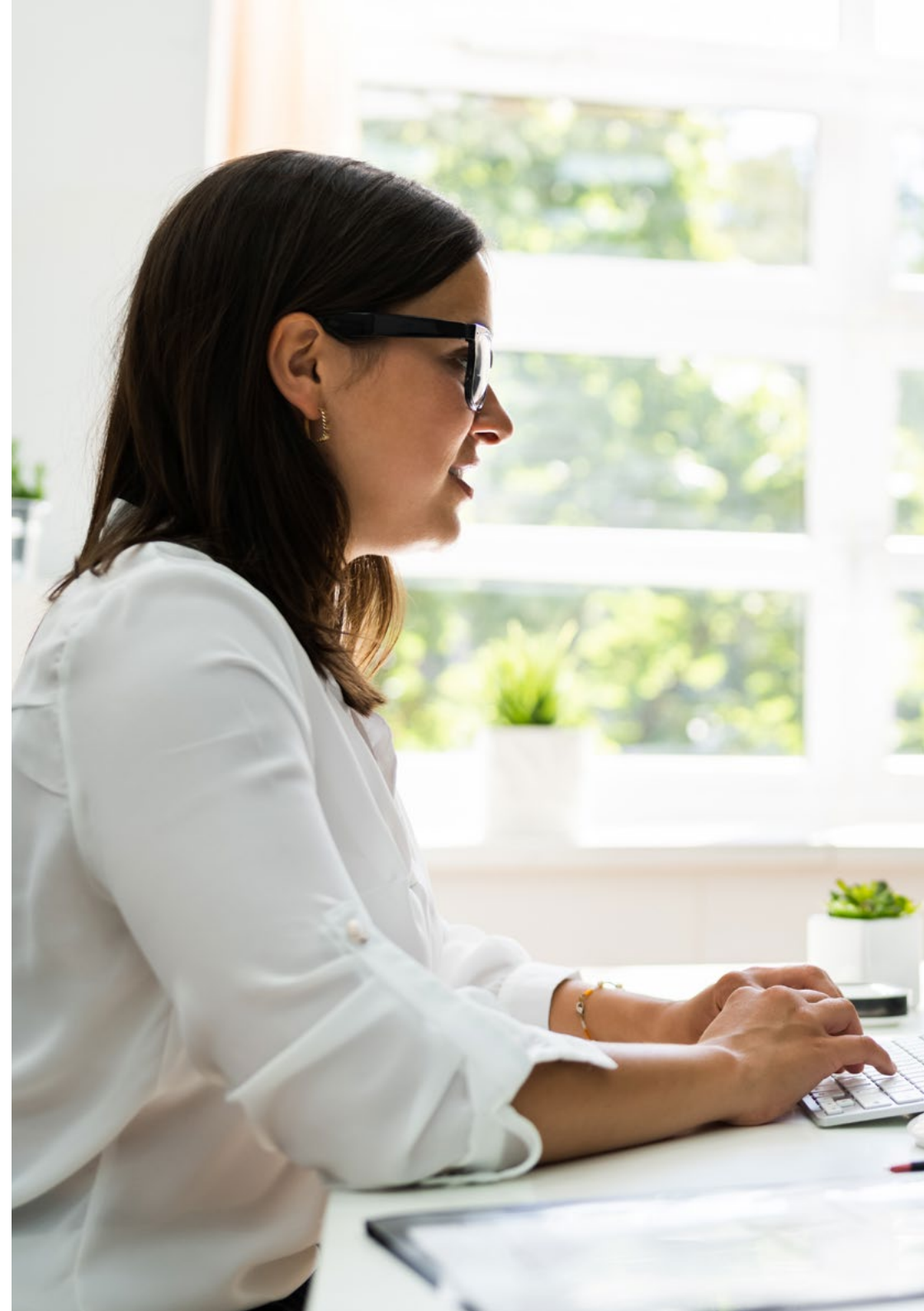


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*Are you going to miss the chance to update yourself in T-SNE through a modern program that will not limit you in your current job development? If the answer is no, choose TECH to get it”*

## 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 Neighbor Embedding)
- 1.10. UMAP (Uniform Manifold Approximation and Projection)





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*Enroll now and get all the keys in the typology of graphs for the representation of the results of your research and those in which you participate”*

# 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. Physiotherapists/kinesiologists 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 of professional physiotherapy 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. Physiotherapists/kinesiologists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.
2. The learning process has a clear focus on practical skills that allow the physiotherapist/kinesiologist 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 physiotherapist/kinesiologist 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 trained more than 65,000 physiotherapists/kinesiologists with unprecedented success in all clinical 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 our 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 really 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.



#### Physiotherapy Techniques and Procedures on Video

TECH brings students closer to the latest techniques, the latest educational advances and to the forefront of current Physiotherapy techniques and procedures. 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 them as many times as you want.



#### 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 unique multimedia content presentation training system 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 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.

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 Diploma, 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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