

# Postgraduate Certificate

## Biomedical Databases, the Foundations of Big Data





## Postgraduate Certificate

### Biomedical Databases, the Foundations of Big Data

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

Website: [www.techtitute.com/in/physiotherapy/postgraduate-certificate/biomedical-databases-foundations-big-data](http://www.techtitute.com/in/physiotherapy/postgraduate-certificate/biomedical-databases-foundations-big-data)

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# 01

# Introduction

The development of Big Data and the involvement of IoT in more and more areas of the clinical sector has made it possible to create technological strategies that have served to connect professionals from all over the world, jointly contributing to the development of science. Thanks to Big Data and hyperconnectivity, sharing and finding information has become a simple and extremely important task for healthcare progress. For this reason, the Physiotherapy specialist must know in detail the main biomedical databases, as well as the latest developments in relation to their use and comprehensive management, has become a skill with which he can always be up to date with the advances made in their field. For this you can count on this 100% online program, which covers the main sources of information in a dynamic and exhaustive way and with which you will acquire up-to-date knowledge on the most effective techniques to search for specific data at the click of a button.



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*Would you like to find all the information you need immediately? TECH will give you the keys to achieve it through this 100% online Postgraduate Certificate"*

Since the construction of the first library and up to now, the advances that have been made in different fields (history, science, society, politics, etc.) have gradually increased the amount of information available to any professional to continue with the development and improvement of their field. However, although decades ago this issue seemed impossible, the evolution of technology and the possibilities that have arisen around the growth of the Internet, have allowed the creation of digital databases that can be accessed by specialists from all over the world.

In this way, and referring to the field of physiotherapy, if a new therapeutic technique is discovered in Spain that reduces pain in a certain area of the body through the use of innovative electrostimulation technology, any professional in the United States, China or South Africa will be able to keep up to date with the advances made in this field and apply them to their patients. For this reason, the management of the main biomedical databases has become a necessity for them.

In order to provide them with an intensive and multidisciplinary update, TECH and its team of experts in bioinformatics and biomedical engineering have developed a complete Postgraduate Certificate with which they will be able to learn in detail about the advances in this area. You will be able to delve into the characteristics of the main sources of DNA data, proteins, omics projects, genetic diseases, adverse drug reactions and much more! In addition, they will also delve into the recommendations for their use in each case.

For this purpose, they will have 150 hours of diverse content, which goes beyond the pure theoretical syllabus, as it includes: detailed videos, research articles, complementary readings, dynamic summaries, etc. Everything that the graduates will need to delve in a personalized way in those aspects that they consider most relevant for their correct professional performance. It is, therefore, a unique opportunity to get up to date in a guaranteed way and through a 100% online educational experience.

This **Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data** 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 biomedical databases and biological research
- ◆ 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
- ◆ Content that is accessible from any fixed or portable device with an Internet connection



*In-depth knowledge of the main data sources and their latest developments will save you a lot of time searching"*

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*You will work intensively on research data management plans, using the latest information from Big Data and the biomedical sector”*

*If you are looking for a program that allows you to keep up to date with the activity of your practice, this Postgraduate Certificate is perfect for you.*

*No fixed schedules or on-site classes. You choose when, where and how to connect thanks to the flexible and convenient format of this program.*

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.

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 students will be assisted by an innovative interactive video system created by renowned and experienced experts.



# 02

## Objectives

The objective of this program is none other than to provide the graduates with all the teaching tools that will allow them to achieve their own goals in their professional sector. TECH and its team of experts have invested dozens of hours in shaping a complete, current, comprehensive and top quality program, adapted to the most demanding specifications of the market. Therefore, by completing the course, the student will have acquired all the necessary skills to successfully manage biomedical databases.







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*A program that will enable you to implement the most effective and innovative medical record repository management strategies in your practice”*



## General Objectives

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- ◆ Develop key concepts of medicine that serve as a vehicle to understand clinical medicine
- ◆ Determine the major diseases affecting the human body classified by apparatus or systems, structuring each module into a clear outline of pathophysiology, diagnosis, and treatment
- ◆ Determine how to obtain metrics and tools for healthcare management
- ◆ Understand the basics of basic and translational scientific methodology
- ◆ Examine the ethical and best practice principles governing the different types of research in health sciences
- ◆ Identify and generate the means of funding, assessing and disseminating scientific research
- ◆ Identify the real clinical applications of the various techniques
- ◆ Develop the key concepts of computational science and theory
- ◆ Determine the applications of computation and its implication in bioinformatics
- ◆ Provide the necessary resources to practically apply all the concepts in the modules
- ◆ Develop the fundamental concepts of databases
- ◆ Determine the importance of medical databases
- ◆ Delve into the most important techniques in research
- ◆ Identify the opportunities offered by the IoT in the field of E-Health
- ◆ Provide specialized knowledge of the technologies and methodologies used in the design, development and assessment of telemedicine systems
- ◆ Determine the different types and applications of telemedicine
- ◆ Delve into the most common ethical aspects and regulatory frameworks of telemedicine
- ◆ Analyze the use of medical devices
- ◆ Develop the key concepts of entrepreneurship and innovation in e-Health
- ◆ Determine what a business model is and the types that exist
- ◆ Collect e-Health success stories and mistakes to avoid
- ◆ Apply the knowledge acquired to an original business idea



## Specific Objectives

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- ◆ Understand the concept of biomedical information databases
- ◆ Examine the different types of biomedical information databases
- ◆ Study data analysis methods in depth
- ◆ Compile models that are useful in predicting outcomes
- ◆ Analyze patient data and organize it logically
- ◆ Report on large amounts of information
- ◆ Determine the main lines of research and testing
- ◆ Utilize tools for bioprocess engineering



*The program includes an exhaustive study of the main problems with secondary data use in healthcare, so that you can avoid them and solve them if they occur”*

03

# Course Management

Not all universities include teaching support in their programs, formed by specialized teams in the field developed in the program. However, TECH does. In addition, this university submits candidates to an exhaustive and demanding analysis, resulting in the formation of the best faculty, made up of experts with a broad and extensive professional experience in the sector, as is the case of this Postgraduate Certificate.





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*In order for you to improve your professional skills, the teaching team has selected for this Postgraduate Certificate practical cases based on real situations in which you will have to apply what has been developed”*

## Management



### Ms. Sirera Pérez, Ángela

- ◆ Biomedical Engineer expert in Nuclear Medicine and exoskeleton design
- ◆ Designer of specific parts for 3D printing at Technadi
- ◆ Technician in the Nuclear Medicine area of the University Clinic of Navarra
- ◆ Degree in Biomedical Engineering from the University of Navarra
- ◆ MBA and Leadership in Healthcare and Medical Technology Companies

## Professors

### Ms. Ruiz de la Bastida, Fátima

- ◆ Data Scientist at IQVIA
- ◆ Area Specialist, Bioinformatics Unit, Jimenez Diaz Foundation Research Institute
- ◆ Oncology Researcher at the La Paz University Hospital
- ◆ Graduate in Biotechnology, University of Cadiz
- ◆ Master's Degree in Bioinformatics and Computational Biology, Autonomous University of Madrid
- ◆ Specialist in Artificial Intelligence and Data Analysis at the University of Chicago



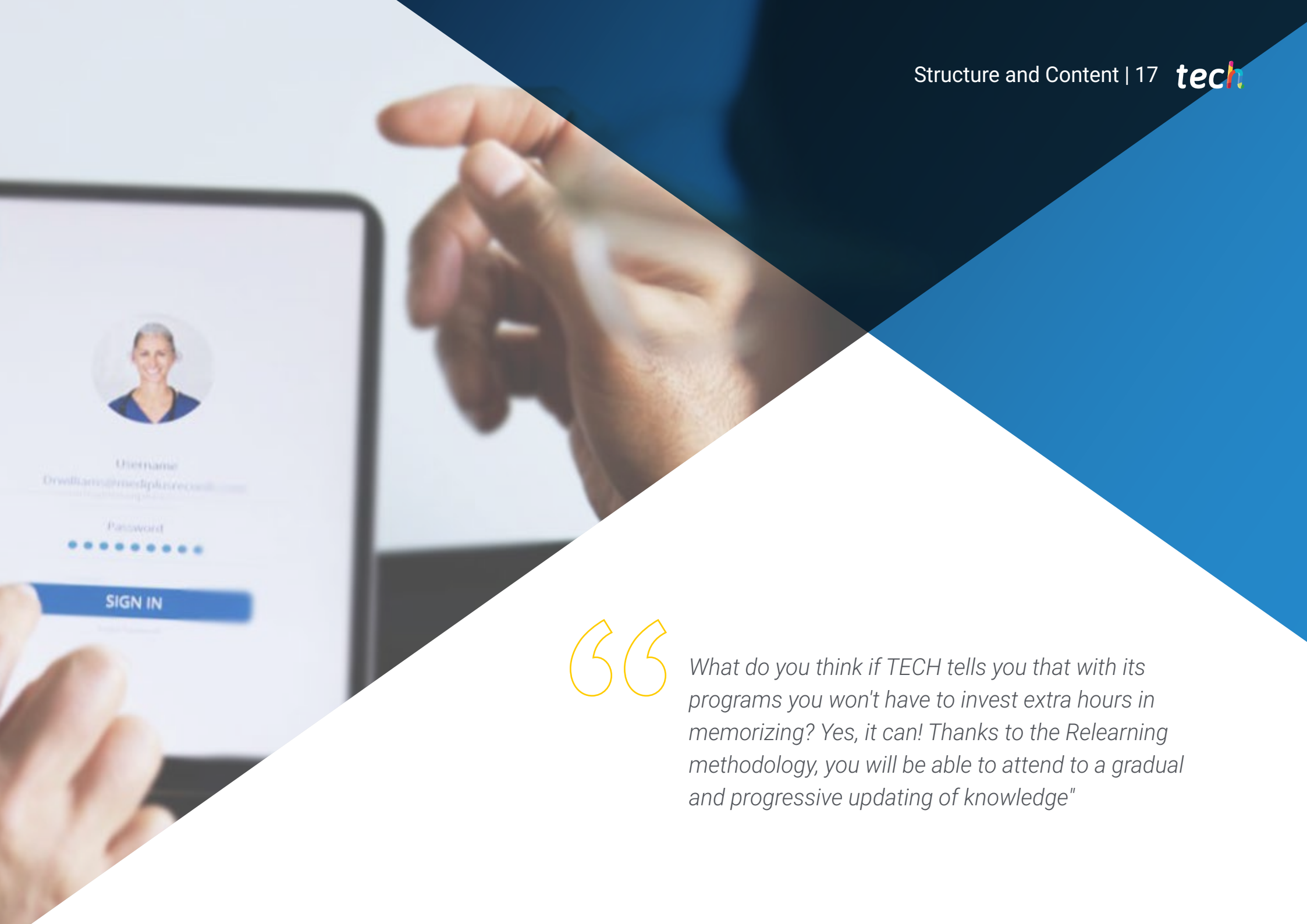
# 04

## Structure and Content

Developing this Postgraduate Certificate has been a real challenge for TECH and its team of experts, who, despite being versed in Bioinformatics, have had to carry out an exhaustive research task to shape a complete program, up-to-date and adapted to the pedagogical criteria that define and differentiate this university. In addition, with an emphasis on the multidisciplinary factor that characterizes all the programs of this institution, they have also included in its content hours of additional material in audiovisual format, research articles, dynamic summaries and complementary readings so that the graduates can make the most of this educational experience and delve into the most relevant aspects of the syllabus for their professional performance.







“

*What do you think if TECH tells you that with its programs you won't have to invest extra hours in memorizing? Yes, it can! Thanks to the Relearning methodology, you will be able to attend to a gradual and progressive updating of knowledge"*

## Module 1. Biomedical Databases

- 1.1. Biomedical Databases
  - 1.1.1. Biomedical Databases
  - 1.1.2. Primary and Secondary Databases
  - 1.1.3. Major Databases
- 1.2. DNA Databases
  - 1.2.1. Genome Databases
  - 1.2.2. Gene Databases
  - 1.2.3. Mutations and Polymorphisms Databases
- 1.3. Protein Databases
  - 1.3.1. Primary Sequence Databases
  - 1.3.2. Secondary Sequence and Domain Databases
  - 1.3.3. Macromolecular Structure Databases
- 1.4. Omics Projects Databases
  - 1.4.1. Genomics Studies Databases
  - 1.4.2. Transcriptomics Studies Databases
  - 1.4.3. Proteomics Studies Databases
- 1.5. Genetic Diseases Databases. Personalized and Precision Medicine
  - 1.5.1. Genetic Diseases Databases
  - 1.5.2. Precision Medicine. The Need to Integrate Genetic Data
  - 1.5.3. Extracting Data from OMIM
- 1.6. Self-Reported Patient Repositories
  - 1.6.1. Secondary Data Use
  - 1.6.2. Patients' Role in Deposited Data Management
  - 1.6.3. Repositories of Self-Reported Questionnaires. Examples:
- 1.7. Elixir Open Databases
  - 1.7.1. Elixir Open Databases
  - 1.7.2. Databases Collected on the Elixir Platform
  - 1.7.3. Criteria for Choosing between Databases



- 1.8. Adverse Drug Reactions (ADRs) Databases
  - 1.8.1. Pharmacological Development Processes
  - 1.8.2. Adverse Drug Reaction Reporting
  - 1.8.3. Adverse Reaction Repositories at Local, National, European and International Levels
- 1.9. Research Data Management Plans. Data to be Deposited in Public Databases
  - 1.9.1. Data Management Plans
  - 1.9.2. Data Custody in Research
  - 1.9.3. Data Entry in Public Databases
- 1.10. Clinical Databases. Problems with Secondary Use of Health Data
  - 1.10.1. Medical Record Repositories
  - 1.10.2. Data Encryption
  - 1.10.3. Access to Health Data. Legislation

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*The best option for you, for the future of Physiotherapy and for your patients is offered in this Postgraduate Certificate. Are you going to let this opportunity pass by?"*

# 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

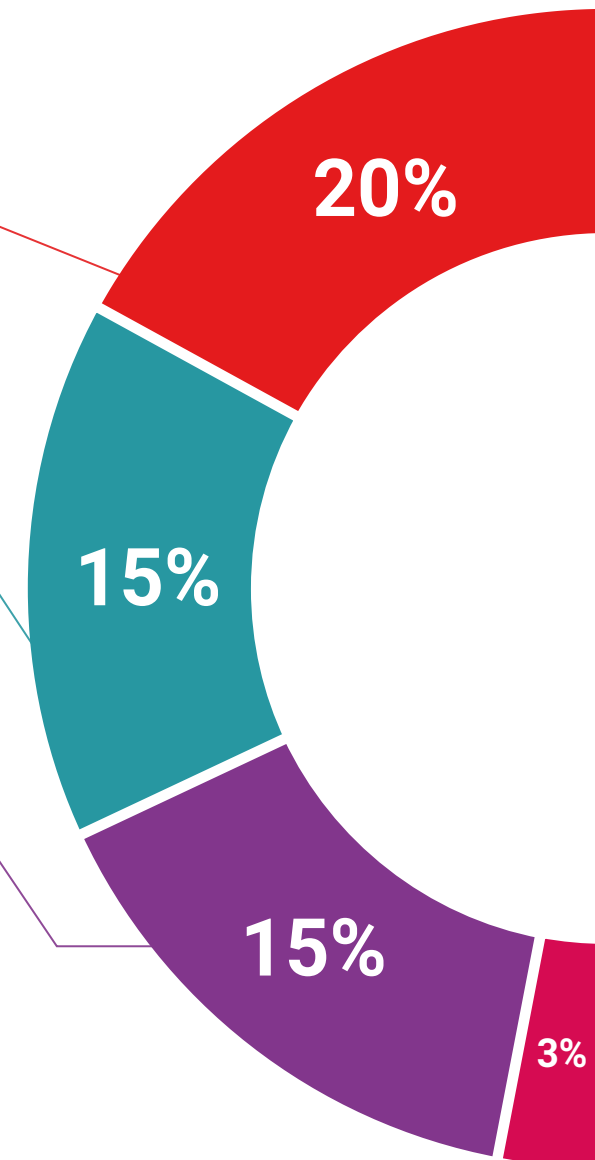
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

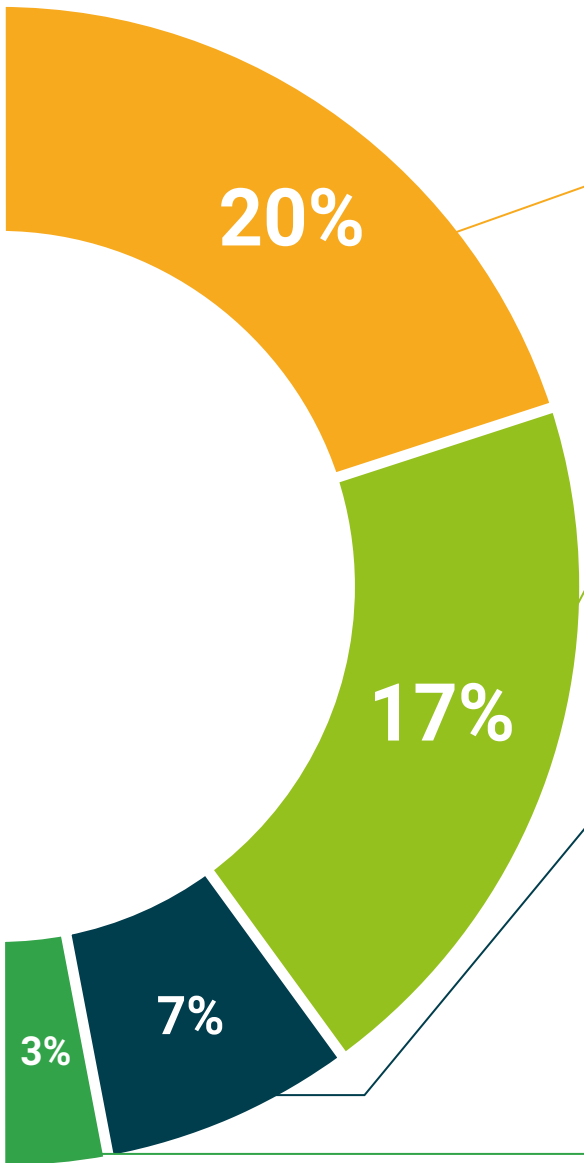
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



### 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 Biomedical Databases, the Foundations of Big Data 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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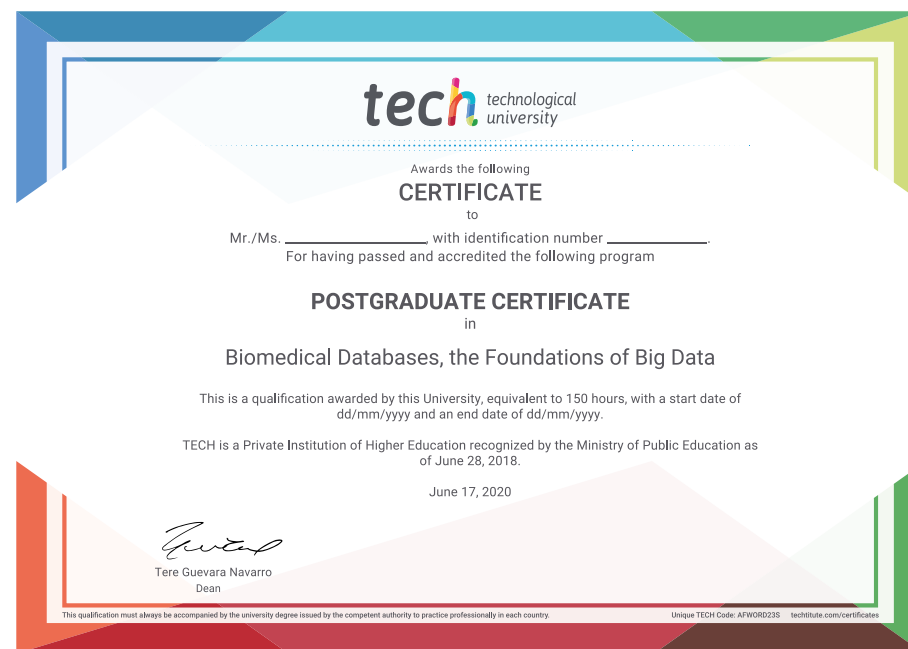
*Successfully complete this program  
and receive your university qualification  
without having to travel or fill out  
laborious paperwork”*

This **Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data** 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 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 Biomedical Databases, the Foundations of Big Data**  
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.



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