

# 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.techtute.com/us/nursing/postgraduate-certificate/biomedical-databases-foundations-big-data](http://www.techtute.com/us/nursing/postgraduate-certificate/biomedical-databases-foundations-big-data)

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# 01

# Introduction

The main objective of Big Data has always been to offer personalized services in all areas of daily life. One of them is health care, where Big Data processing is already being applied globally and the individualization of the clinical service is being pursued. For its application, professionals with a high degree of specialization in e-Health are required and they have to be up to date to develop data processing with innovative digital tools. For this reason, TECH offers a program that deepens the new Big Data updates, in order to optimize the social and health care and streamline registration processes in the international data system. This is a 100% online program with dynamic audiovisual contents that make the study a key opportunity to combine comprehensive training with the other responsibilities of daily life of nursing graduates.



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*Enroll now to deepen your knowledge of medical research lines and apply in your clinical practice tools for bioprocess engineering to improve the quality of life of those affected"*

Biomedicine, in parallel with Big Data, are pursuing faster and more effective biological treatments. In this sense, data analysis could make clinical operations more efficient and practical. Nurses would have real-time patient information at their fingertips, which would improve the triage system in full knowledge of multiple emergencies and could prevent infections and hospital errors. All this, with a globalized approach that enables collaboration in the future development of molecular biology.

Industrial, technological and electronic advances applied to telemedicine have given rise to a modernized health service. Patients with epidemiological diseases no longer have to travel to a doctor's office for monitoring, but can be monitored telematically. This also breaks down barriers for people with reduced mobility or disabilities. In short, universal medical care. For its development, the professional health care market demands a large number of nurses who master all the strategic tools and techniques to promote Big Data research.

For this reason, and also in response to the demand of professionals already working in the health sector, TECH offers this Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data, to graduates in Nursing. This is a complete and rigorous program in biomedical information and bioprocess research. In this way, students who wish to broaden their technical knowledge and be able to put it into practice will be able to acquire all the knowledge that will enrich their professional practice through joint learning with expert teachers in the area and with whom they will be able to contact through a direct communication channel.

Students who take the program will have the application of the Relearning methodology, which will avoid long hours of study and will enable them to assimilate the concepts in a simple and progressive way, through repetition. Additionally, TECH offers a multitude of content in various multimedia formats that can also be downloaded. In this way, once the specialists have saved the reference guide on their personal device, they can consult it whenever they wish, even at the end of the program. All this at the click of a button.

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
- ♦ The practical exercises where the self-evaluation 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



*Thanks to TECH, you will understand the importance of applying precision medicine, which integrates genetic data to certify a diagnosis and prevent diseases"*

“

*With this course, in only 6 weeks you will develop the control of health data and the role of this information for the prediction of results"*

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 allow the professional a situated and contextual learning, that is, a simulated environment that will provide an immersive training programmed to train in real situations.

The design of this program focuses on Problem-Based Learning, in which the professional will have to try to solve the different professional practice situations that will arise throughout the academic course. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

*Analyze the intricacies of databases for the development of transcriptomics and proteomics studies in clinical centers.*

*Explore the usefulness of self-reported patient data repositories for long-term therapeutic follow-up of your patients.*



# 02 Objectives

The main objective of this Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data is to increase the professional career opportunities for graduates in Nursing, focusing on the benefits of Big Data in medicine and the importance of its application in today's health care. Additionally, students will be able to update their knowledge, taking into account the new techniques of modern medicine and will have pedagogical tools, such as a reference guide, which will be useful in the professional application of the knowledge they acquire. In this way, the graduate will be able to contribute to the advancement of data collection and processing at a global and forward-looking level.





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*Thanks to TECH, you will learn about the origin of biomedical databases and you will be trained in the application of technology in medicine in order to master the field of e-Health"*



## 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 eHealth
- ♦ 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 eHealth
- ♦ Determine what a business model is and the types that exist
- ♦ Collect eHealth 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



*Enroll now in this Postgraduate Certificate and deepen in the study of massive medical data processing to apply it in therapies in an intelligent way"*

# 03

# Course Management

TECH has drawn on the knowledge of experts in Big Data integrated in medicine for its dissemination through this Postgraduate Certificate. This teaching team has not only poured its knowledge in biomedicine and Big Data into the syllabus of this program, but will also be available to students to share with them their own experience in the field of clinical practice. In this way, nursing graduates will be able to learn with the guarantee of having experts with extensive experience in radiophysics and biological engineering, which will be through a direct communication channel to resolve doubts about the agenda.





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*Acquire great knowledge in biomedical databases, with the support of an expert teaching team that will guide you and give you the keys to develop the clinical praxis”*

## 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 from the University of Cadiz
- ♦ Master's Degree in Bioinformatics and Computational Biology at the Autonomous University of Madrid
- ♦ Specialist in Artificial Intelligence and Data Analysis at the University of Chicago



# 04

# Structure and Content

The syllabus of this Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data has been developed in detail by professionals working in the field of biological research, microelectronic research and software. Thanks to its scientific contribution, this program has the endorsement of offering theoretical and practical knowledge based on the real experience of experts. Additionally, to facilitate your study, TECH applies the Relearning methodology. This pedagogical technique allows the assimilation of the contents in a constant and gradual way, so that specialists do not have to invest long hours of memorization, as in other orthodox programs. It is an opportunity to delve into DNA databases and powerful clinical databases that will shed light on public health management plans.







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*Explore the benefits of mastering databases for the identification of RAMs and their determination in the pharmacological process”*

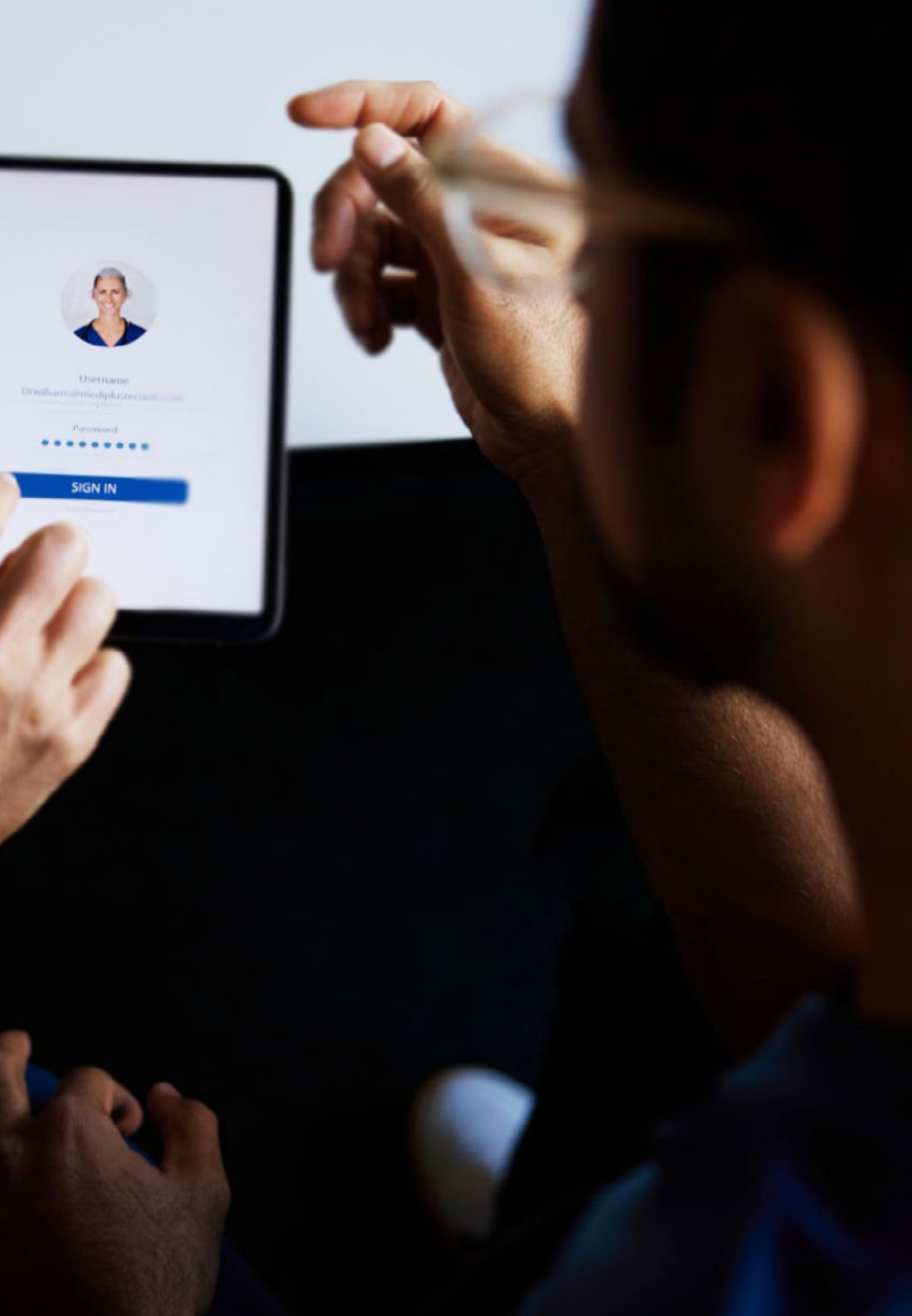
## Module 1. Biomedical Databases

- 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. Example
- 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 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

“*A program designed so that you can adapt it to your current job and develop it with total flexibility without having to do without the other areas of your life*”



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.





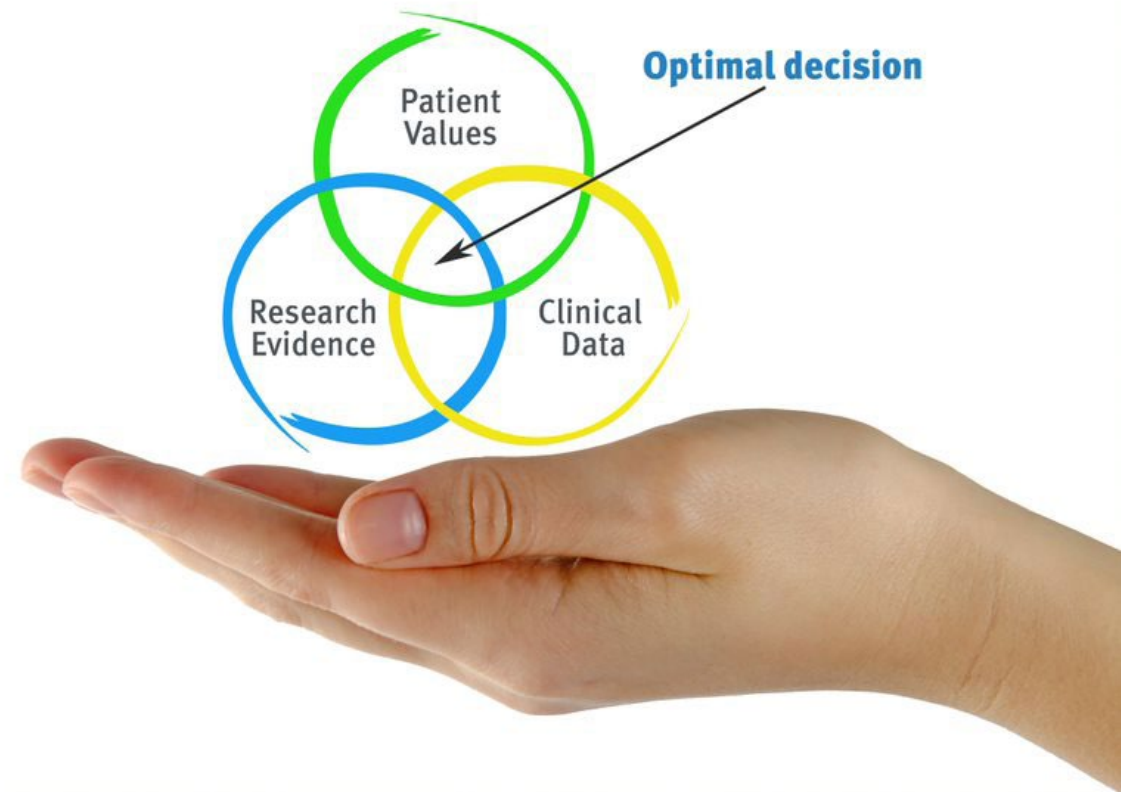
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH Nursing School 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. Nurses learn better, faster, and more sustainably over time.

*With TECH, nurses can experience a learning methodology that is shaking the foundations of traditional universities around the world.*



According to Dr. Gervas, 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, in an attempt to recreate the real conditions in professional nursing 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. Nurses 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 nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
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 case studies with a 100% online learning system based on repetition combining a minimum of 8 different elements in each lesson, which is a real revolution compared to the simple study and analysis of cases.



*The nurse 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 175,000 nurses with unprecedented success in all specialities regardless of practical 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 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 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.



### Nursing Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, 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 them as many times as you want.



### Interactive Summaries

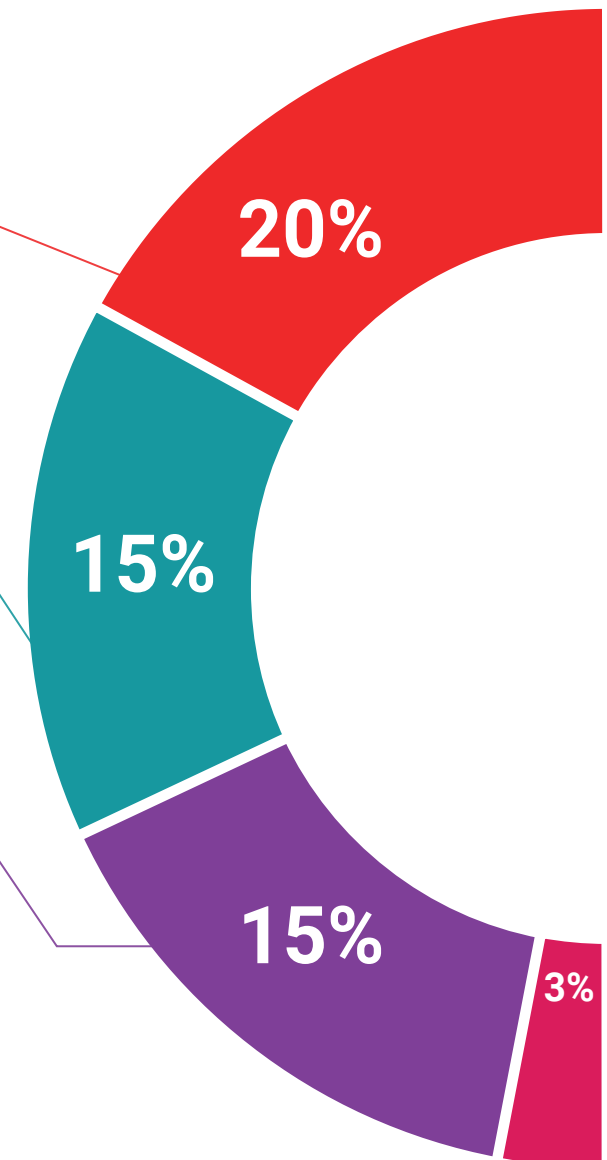
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

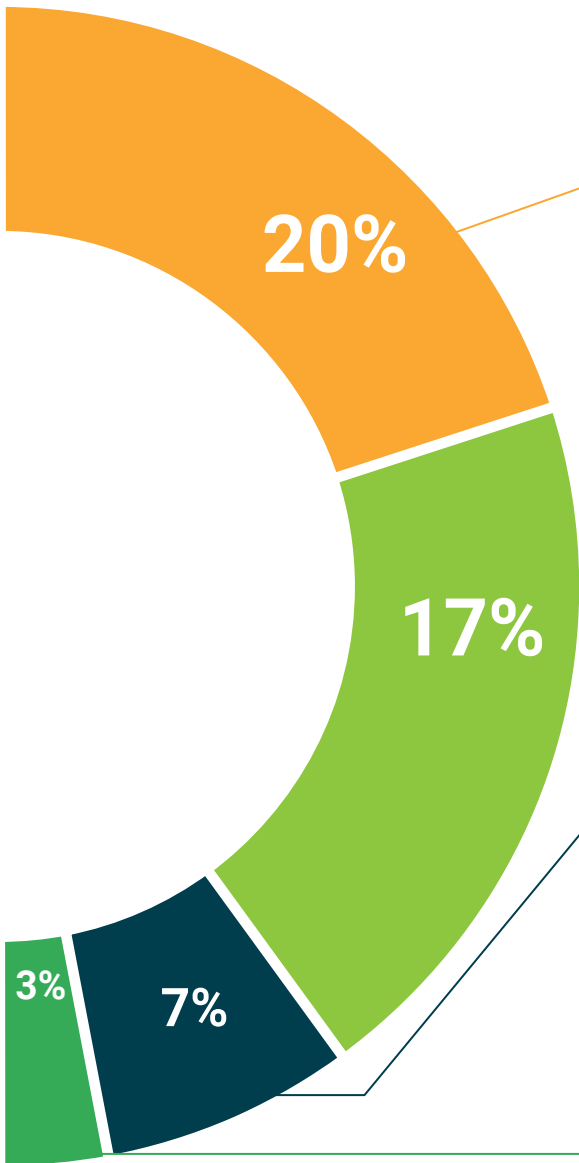
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



### 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 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”*

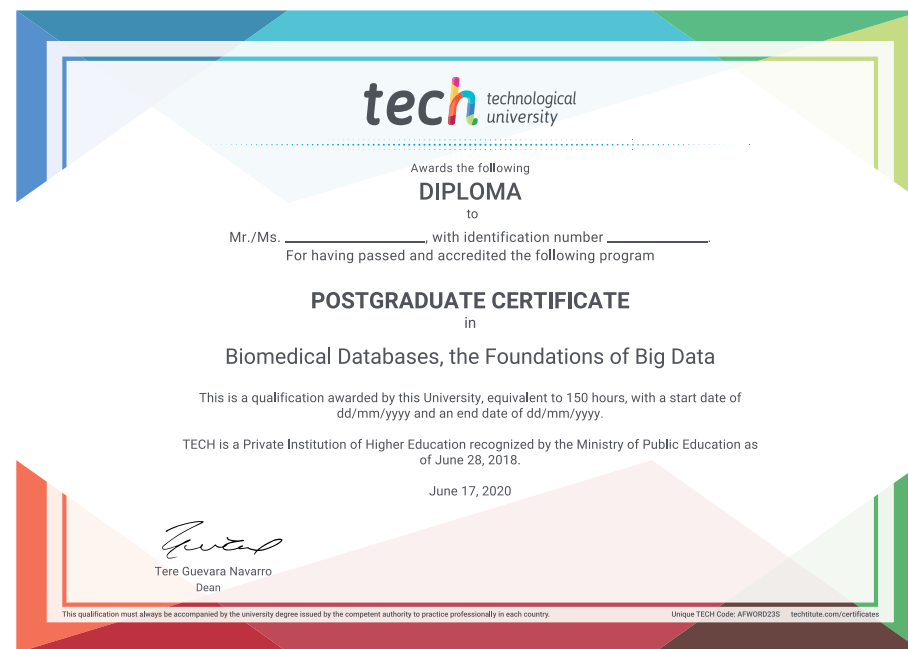
This **Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data** is the most complete and up-to-date scientific program on the market.

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 diploma 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  
community commitment  
personalized service innovation  
knowledge present  
development language  
virtual classroom



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