

# 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 Global University
- » Credits: 6 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/information-technology/postgraduate-certificate/biomedical-databases-foundations-big-data](http://www.techtute.com/us/information-technology/postgraduate-certificate/biomedical-databases-foundations-big-data)

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# 01 Introduction

Thanks to Big Data and the improvement of analysis and massive data management, digitalization and process automation have become great allies of the medical sector. This leads to a growing demand from clinical institutions for IT professionals specialized in this field, which is why this TECH program is positioned as a fantastic tool. Therefore, the graduate will be able to update on the different biomedical databases, examining their characteristics, data management plans and advantages and disadvantages of the use of each of them. All this 100% online and through an unparalleled experience in today's university environment.





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*Would you like to add mastery of creating self-reported questionnaire repositories to your resume? This University Course will provide you with everything you need and more"*

The invention and development of Pubmed, Cinhal and Scopus, mainly, have meant an enormous advance for the medical sector, boosted by the possibility of sharing clinical information from anywhere and immediately with specialists from all over the world. With a single click, health care professionals can access hundreds of studies, research and medical data, with all the advantages that this entails.

It is therefore an area in which computer scientists have multiple job opportunities, not only in the field of development and innovation, but also in management and maintenance. However, since it is a field in continuous evolution, updating is crucial to carry out these tasks in an optimal and specialized way. And this you will more than achieve by completing this Postgraduate Certificate.

Throughout 180 hours of highly multidisciplinary training, the student will be able to delve into the most widely used databases in the health sector: DNA, protein, omics projects, genetic diseases, etc. They will also have the opportunity to learn more about their technical characteristics and the keys to their correct handling, as well as to perfect their skills in the creation of research information management plans.

For this purpose, they will have at their disposal the best syllabus, designed by experts in Bioinformatics and Computational Biology. Additionally, they will have a multitude of practical cases based on real situations and hours of additional material with which they will examine in a personalized way the different aspects of the content. In this way, they will benefit from an academic experience that will not only enhance their talent as a computer scientist specialized in e-Health databases, but will also give them access to a wider and more prestigious job market.

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

The most important features include:

- ◆ The development of practical cases presented by experts in biomedical databases
- ◆ The graphic, schematic and eminently practical contents with which it is conceived gather technological and practical information on those 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



*You will be updated in primary and secondary databases, taking as an example the most used in the current clinical field"*

“

*A program designed to enhance your professional quality through specialization in a growing field such as Biotechnology applied to the medical sector”*

*The best program to specialize in biomedical databases is this one, do you want to see for yourself?*

*You will be an expert in the management of genomic, gene, mutation and polymorphism databases.*

The program includes in its teaching staff professionals of the field who pour into this training the experience of their work, in addition to recognized specialists from reference 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.

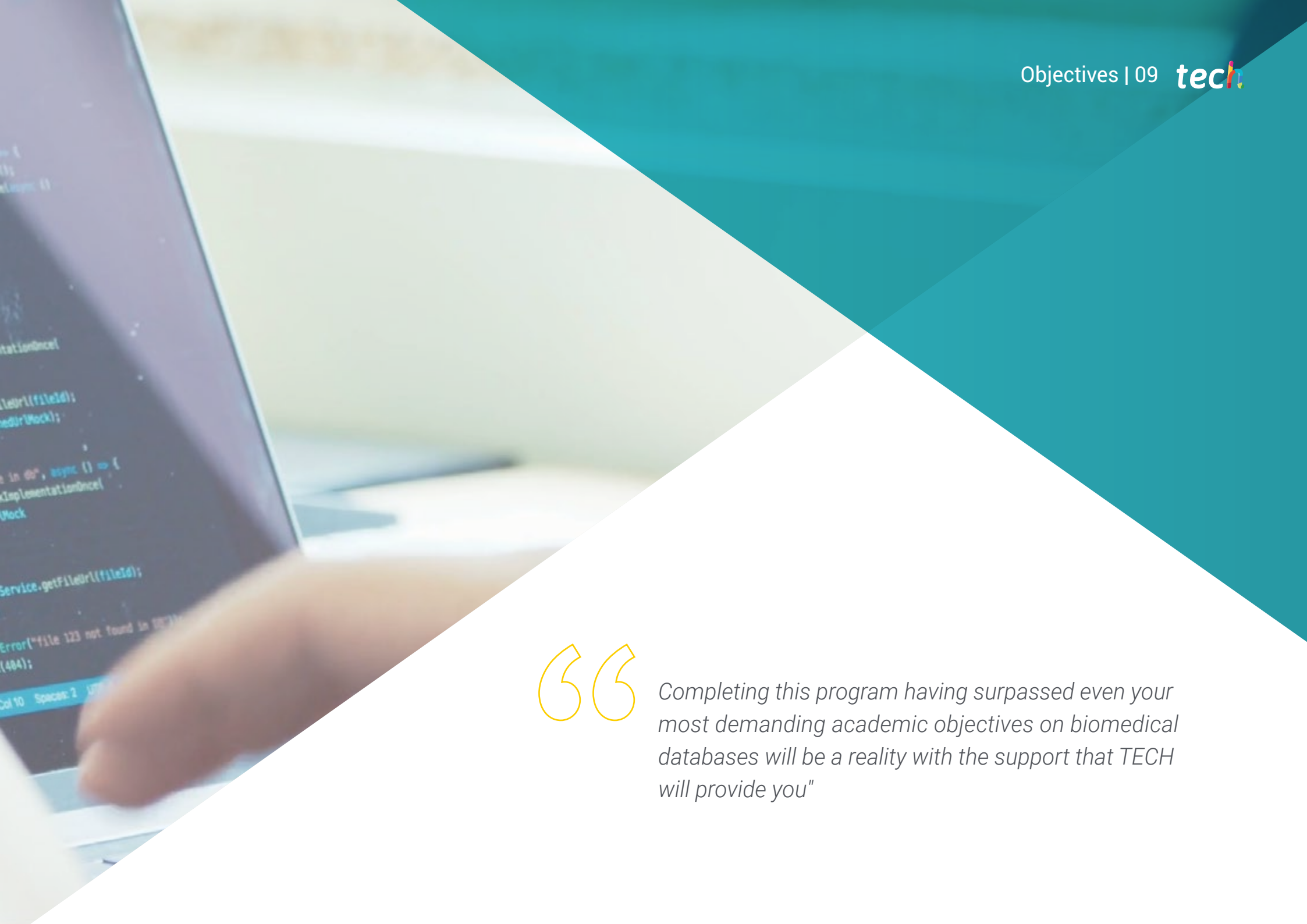


# 02 Objectives

E-Health and the technological developments that have arisen from its evolution would not be possible without the collaboration of IT professionals. For this reason, and with the aim of supporting the growth of this field, TECH and its team of experts have designed this program so that graduates interested in the sector of Bioinformatics and Big Data applied to Medicine can specialize in it.







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*Completing this program having surpassed even your most demanding academic objectives on biomedical databases will be a reality with the support that TECH will provide you"*



## General Objectives

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- ◆ Develop key concepts of medicine that will serve as a vehicle for the understanding of 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 health care management
- ◆ Understand the basics of basic and translational scientific methodology
- ◆ Examine the ethical principles and good practices that govern the different types of health sciences research
- ◆ 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
- ◆ Study 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 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 a comprehensive analysis of the main problems with the secondary use of data in health care, so that you can deal with them with all the guarantees"*

# 03

## Course Management

The fact of being able to count on a teaching team specialized in Medical Engineering and Computational Biology is one of the advantages that make this experience different from the rest. For this reason, TECH always prioritizes the creation of specialized cloisters, so that students can use their extensive professional background to improve their skills. Additionally, they will have the opportunity to consult with the professors on any questions you may have through the Virtual Campus.





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*The teaching team has selected for this program real case studies taken from their daily work, so that you can improve your skills in database management”*

## 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 Health care and Medical Technology Companies

## Professors

### Dr. Somolinos Simón, Francisco Javier

- ♦ Biomedical Engineering Researcher at the Bioengineering and Telemedicine Group of the Polytechnic University of Madrid GBT-UPM
- ♦ R&D&I Consultant at Evaluate Innovation
- ♦ Biomedical Engineering Researcher at the Bioengineering and Telemedicine Group of the Polytechnic University of Madrid
- ♦ PhD's Degree in Biomedical Engineering from the Polytechnic University of Madrid
- ♦ Graduate in Biomedical Engineering from the Polytechnic University of Madrid
- ♦ Master's Degree in Management and Development of Biomedical Technologies from Carlos III University of Madrid

### Mr. Piró Cristobal, Miguel

- ♦ E-Health Support Manager at ERN Transplantchild
- ♦ Electromedical Technician. Electromedical Business Group GEE
- ♦ Data and Analysis Specialist - Data and Analysis Team. BABEL
- ♦ Biomedical Engineer at MEDIC LAB. UAM
- ♦ Director of External Affairs CEEIBIS
- ♦ Degree in Biomedical Engineering, Carlos III University of Madrid
- ♦ Master's Degree in Clinical Engineering Carlos III University of Madrid
- ♦ Master's Degree in Financial Technologies: Fintech Carlos III University of Madrid
- ♦ Training in Data Analysis in Biomedical Research. La Paz University Hospital

**Mr. Varas Pardo, Pablo**

- ◆ Biomedical Engineer and Expert Data Scientist
- ◆ Data Scientist at the Institute of Mathematical Sciences (ICMAT)
- ◆ Biomedical Engineer at La Paz University Hospital
- ◆ Graduate in Biomedical Engineering from the Polytechnic University of Madrid
- ◆ Internship at 12 de Octubre University Hospital
- ◆ Master's Degree in Technological Innovation in Health from the Polytechnic University of Madrid and Higher Technical Institute of Lisbon
- ◆ Master's Degree in Biomedical Engineering from the Polytechnic University of Madrid

**Ms. Muñoz Gutiérrez, Rebeca**

- ◆ Data Scientist at INDITEX
- ◆ Firmware Engineer for Clue Technologies
- ◆ Graduate in Health Engineering with Mention in Biomedical Engineering from the University of Malaga and the University of Seville
- ◆ Master's Degree in Intelligent Avionics from Clue Technologies, in collaboration with the University of Málaga
- ◆ NVIDIA: Fundamentals of Accelerated Computing with CUDA C/C++ NVIDIA: Accelerating CUDA C++ Applications with Multiple GPU

**Ms. Crespo Ruiz, Carmen**

- ◆ Intelligence, Strategy and Privacy Analysis Specialist
- ◆ Director of Strategy and Privacy at Freedom&Flow SL
- ◆ Co-founder of Healthy Pills SL
- ◆ Innovation Consultant & Project Technician at CEEI CIUDAD REAL

- ◆ Co-founder of Thinking Makers
- ◆ Consultancy and Training in Data Protection at Tangente Cooperative Group
- ◆ University Lecturer
- ◆ Law Degree, UNED (National University for Distance Education)
- ◆ Degree in Journalism, University Pontificia of Salamanca
- ◆ Master's Degree in Intelligence Analysis by the Cátedra Carlos III & King Juan Carlos University, with the endorsement of the National Intelligence Center (CNI)
- ◆ Advanced Executive Program on Data Protection Office

**Dr. Pacheco Gutiérrez, Victor Alexander**

- ◆ Surgeon Specialist in Orthopedics and Sports Medicine at the Dr. Sulaiman Al Habib Hospital in Dubai
- ◆ Medical advisor for professional baseball, boxing and cycling teams.
- ◆ Specialty in Orthopedics and Traumatology
- ◆ Degree in Medicine
- ◆ Sports Medicine Fellowship in Sportsmed
- ◆ Member of the American Academy of Orthopedic Surgeons

**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

TECH will provide the computer scientist with the most updated and comprehensive syllabus available on the market. In fact, this Postgraduate Certificate will benefit, like all of the university's programs, from *Relearning*. This pedagogical strategy consists of reiterating the most important concepts throughout the content, in such a way that the student will enjoy a progressive and more natural educational cycle, saving hours of extra memorization. Additionally, it is a technique that guarantees the permanence of the knowledge for a longer period of time, so that the student can carry it with him throughout his career.





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All the material to deepen the typologies of biomedical databases will be on the Virtual Campus from the first moment and 24 hours a day”

## 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 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

“ *A multidisciplinary, avant-garde and innovative program that will undoubtedly elevate your talent to the the pinnacle of the bioinformatics sector*”

# 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"*

## Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

“

*At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world”*



*You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.*



*The student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method has been the most widely used learning system among the world's leading Information Technology schools for as long as they have existed. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the course, students will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.





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.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

*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.*

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



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.



### 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.



### Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### 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.





#### Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



#### 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".



#### 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.



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 Global University.



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

This program will allow you to obtain your **Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Biomedical Databases, the Foundations of Big Data**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**





**Postgraduate Certificate**  
Biomedical Databases, the  
Foundations of Big Data

- » Modality: **online**
- » Duration: **6 weeks**
- » Certificate: **TECH Global University**
- » Credits: **6 ECTS**
- » Schedule: **at your own pace**
- » Exams: **online**

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