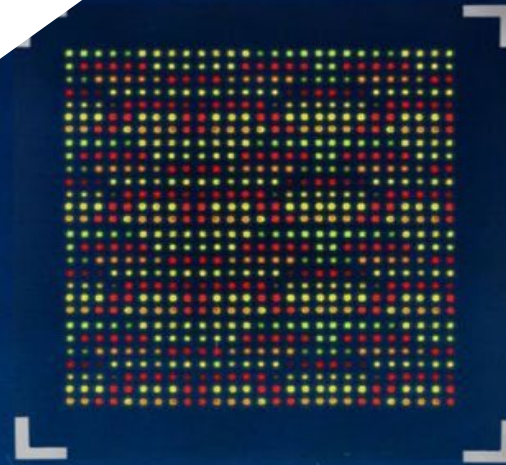


# Postgraduate Certificate

Bioinformatics

Computing: Medical Process

Digitization and Automation





## Postgraduate Certificate Bioinformatics Computing: Medical Process Digitization and Automation

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

Website: [www.techtute.com/pk/engineering/postgraduate-certificate/bioinformatics-computing-medical-process-digitization-automation](http://www.techtute.com/pk/engineering/postgraduate-certificate/bioinformatics-computing-medical-process-digitization-automation)

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# 01

# Introduction

What is known as Bioinformatics or Computational Biology has recently emerged as an interdisciplinary field that relates models and advances in Statistics, Biochemistry or Artificial Intelligence. For this reason, it has become an area of great importance in the industrial sector or in healthcare, among others. Given this situation, experts in this discipline are in great demand by all types of companies and institutions, which are looking for professionals oriented to data automation. This program responds to this context, and provides the student with the latest advances in this science. All of this is based on a 100% online methodology that adapts completely to your circumstances, allowing you to study when and where you want.





“

*Thanks to this Postgraduate Certificate you will be able to advance your career immediately by incorporating the most advanced techniques in Bioinformatics and Data Automation into your professional work"*

Bioinformatics is a discipline that has developed in collaboration with other areas of knowledge, such as Molecular Biology. As the virtues of data management at different scales have been exploited, the practice of this discipline has acquired a series of specifications that distinguish it from other branches of computer engineering: a specific way of visualizing biological data, a specific way of managing such data, a strict life cycle for bioinformatics data, and so on.

The Postgraduate Certificate in Bioinformatics Computing offered by TECH covers all this and more, with a program that delves into aspects such as the visualization of biological sequences, data mining and genetic pattern matching, among many others. In this way, this degree will show the student the relationship between Computing and the current scientific and clinical scene.

This training is 100% online. Therefore, the student will be able to study in a comprehensive way about information architectures for bioinformatics, search engines, applications in the pharmaceutical or genetic field at a distance. The interested person will be supported not only by the prestigious group of specialists who have designed the program, but also by a variety of very useful virtual tools with a large amount of information that will support both the course and the professional practice.

This **Postgraduate Certificate in Bioinformatics Computing: Medical Process Digitization and Automation** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ The development of case studies presented by experts in Bioinformatics Computing
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice.
- ◆ Practical exercises where self-assessment can be used to improve learning.
- ◆ Its special emphasis on innovative methodologies
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ The availability of access to content from any fixed or portable device with an Internet connection



*Stand out in this interdisciplinary sector and support different areas of health and knowledge thanks to the innovative knowledge you will acquire with this 100% online TECH" program"*

“

*With this degree, it deepens, with this degree, in genetic pattern matching using the data analysis of Bioinformatics”*

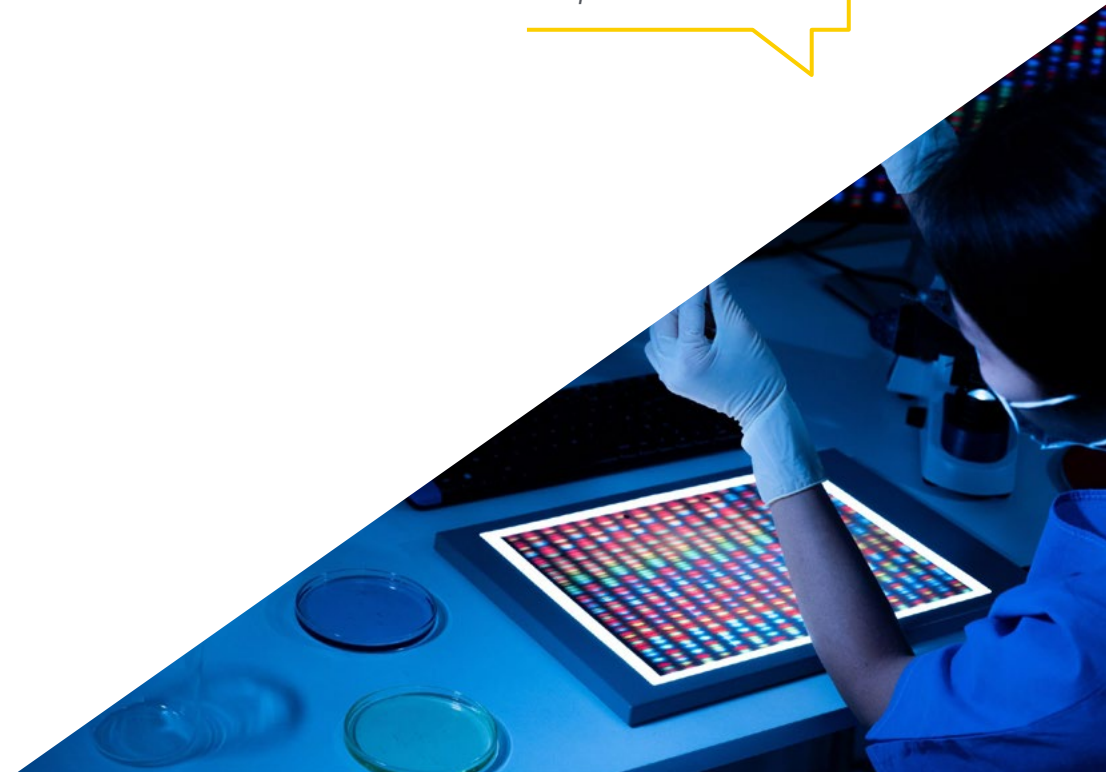
The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive education programmed to learn in real situations.

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

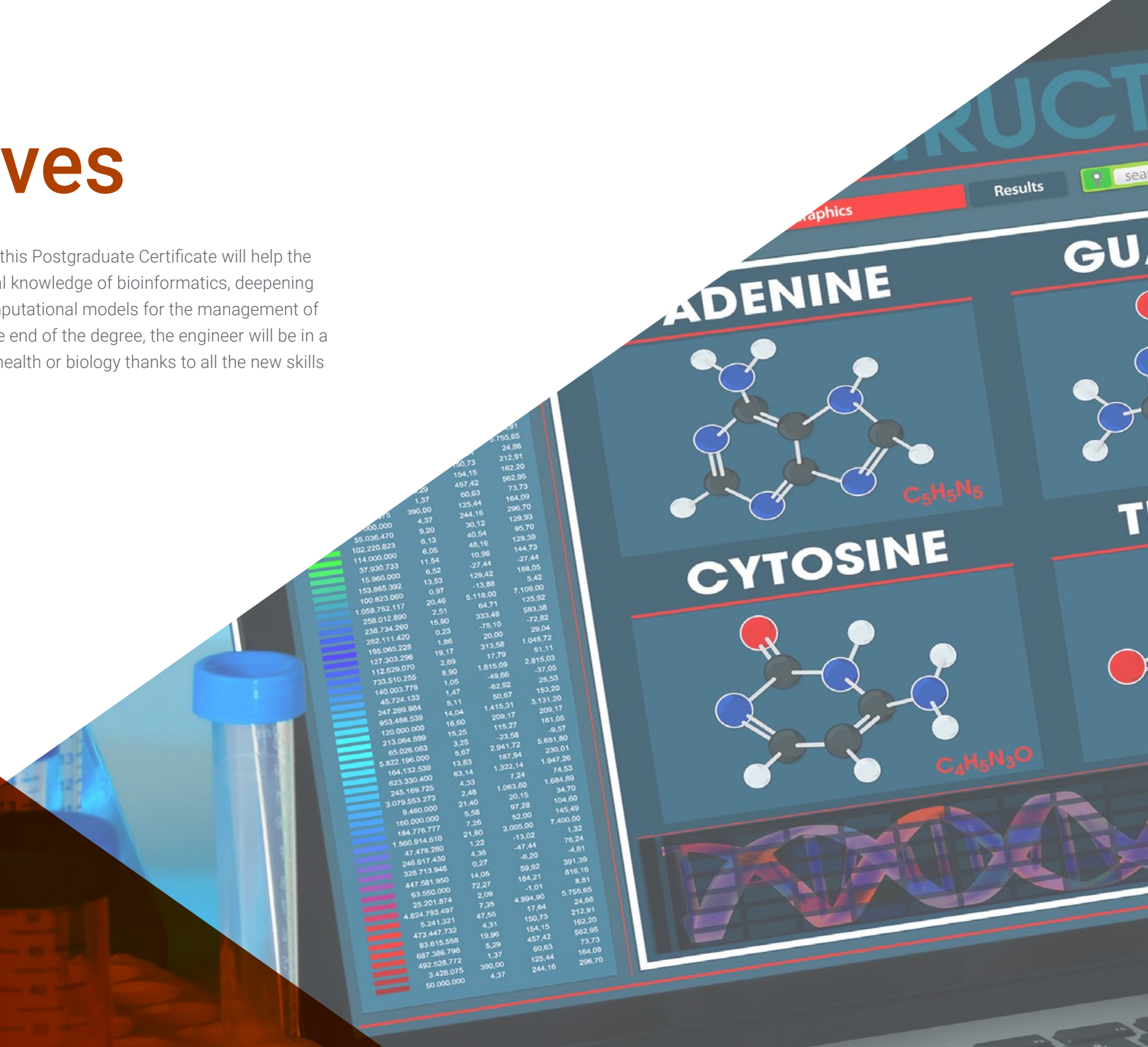
*Statistics is an essential part of computer science and throughout this curriculum you will gain the necessary tools to identify imperfect data.*

*Learn about the latest news on data mining and machine learning from the best professionals.*

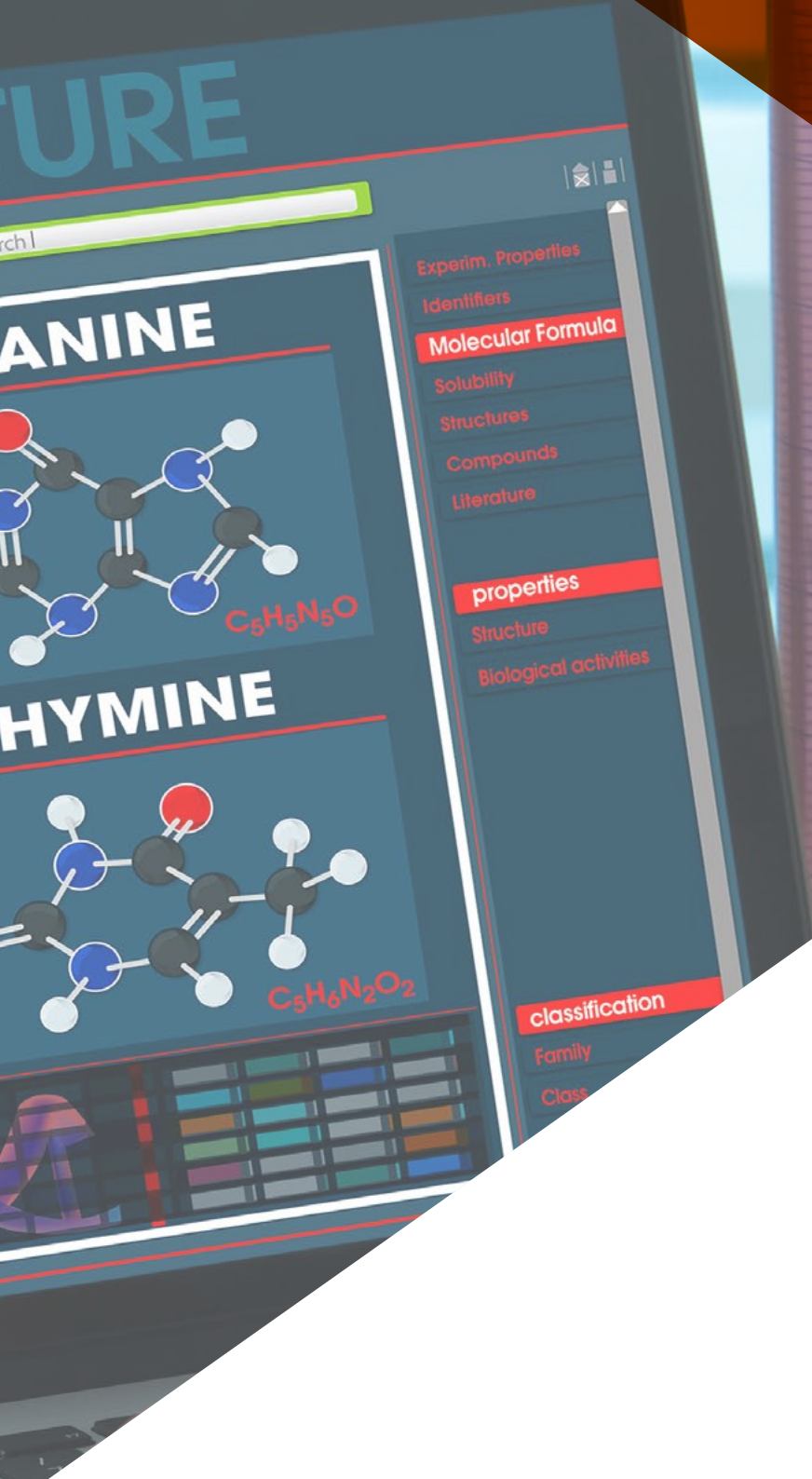


# 02 Objectives

The structure and organization of this Postgraduate Certificate will help the student to strengthen the essential knowledge of bioinformatics, deepening in the different statistical and computational models for the management of biological information. Thus, at the end of the degree, the engineer will be in a position to enter sectors such as health or biology thanks to all the new skills they will have acquired.







“

*Bioinformatics Computing has more and more models and applications, get to know them all with this 100% online program"*



## General Objectives

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- ◆ Develop key concepts of medicine that serve as a vehicle to understand clinical medicine
- ◆ Determine how to obtain metrics and tools for healthcare management
- ◆ 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
- ◆ Analyze the use of medical devices
- ◆ Collect eHealth success stories and mistakes to avoid





### Specific objectives

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- ◆ Understand the concept of computation
- ◆ Break down a computer system into its various parts
- ◆ Distinguish between the concepts of computational biology and bioinformatics computing
- ◆ Master the most commonly used tools in the field
- ◆ Determine future trends in computing
- ◆ Analyze biomedical datasets with Big Data techniques



*This program has the most advanced multimedia resources in the educational market: videos, case studies or interactive summaries, among many others"*

# 03

# Course Management

TECH understands the relevance that the use of computational technologies has acquired in recent times in the development of science, both in research work and in its day-to-day professional applications, such as medical practices. In this order of ideas, TECH has gathered a group of professionals highly specialized in Bioinformatics for the design of this program. A group of professionals from the areas of health, biomedical engineering, biology and computing have designed this program in collaboration with TECH to offer to all those interested in Bioinformatics Computing and all the possibilities that this area offers.



“

*Learn more about a constantly evolving area with more and more applications, learn about Bioinformatics at TECH”*

## 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 H ealthcare and Medical Technology Companies

## Professors

### Mr. Piró Cristobal, Miguel

- ♦ e-Health Support Manager at ERN TRANSPLANTCHILD
- ♦ 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, Madrid, 2019; Master's Degree in Financial Technologies: Fintech Carlos III University of Madrid



# 04

# Structure and Content

The content of this program introduces the latest developments in the handling and management of biological data with information technologies and statistical models. Therefore, this Postgraduate Certificate includes in its division and structure all the procedures, proven for their efficiency and currently used, of information flow management for biological-clinical topics. This is achieved by deepening, in turn, in the statistical techniques that comprise computation and its applications in topics such as genetics. All this content is taught completely online with a host of virtual tools that make this a complete and comprehensive course.







“

*Get to know all the current applications of bioinformatics thanks to this carefully structured program with the latest information on this complex and exciting subject"*

## Module 1. Computation in Bioinformatics

- 1.1. Central Tenet in Bioinformatics and Computing. Current State
  - 1.1.1. The Ideal Application in Bioinformatics
  - 1.1.2. Parallel Developments in Molecular Biology and Computing
  - 1.1.3. Dogma in Biology and Information Theory
  - 1.1.4. Information Flows
- 1.2. Databases for Bioinformatics Computing
  - 1.2.1. Database
  - 1.2.2. Data management
  - 1.2.3. Data Life Cycle in Bioinformatics
    - 1.2.3.1. Use
    - 1.2.3.2. Modifications
    - 1.2.3.3. Archive
    - 1.2.3.4. Reuse
    - 1.2.3.5. Discarded
  - 1.2.4. Database Technology in Bioinformatics
    - 1.2.4.1. Architecture
    - 1.2.4.2. Database Management
  - 1.2.5. Interfaces for Bioinformatics Databases
- 1.3. Networks for Bioinformatics Computing
  - 1.3.1. Communication Models. LAN, WAN, MAN and PAN Networks
  - 1.3.2. Protocols and Data Transmission
  - 1.3.3. Network Topologies
  - 1.3.4. Datacenter Hardware for Computing
  - 1.3.5. Security, Management and Implementation
- 1.4. Search Engines in Bioinformatics
  - 1.4.1. Search Engines in Bioinformatics
  - 1.4.2. Search Engine Processes and Technologies in Bioinformatics
  - 1.4.3. Computational Models: Search and Approximation Algorithms



- 1.5. Data Display in Bioinformatics
  - 1.5.1. Displaying Biological Sequences
  - 1.5.2. Displaying Biological Structures
    - 1.5.2.1. Visualization Tools
    - 1.5.2.2. Rendering Tools
  - 1.5.3. User Interface in Bioinformatics Applications
  - 1.5.4. Information Architectures for Displays in Bioinformatics
- 1.6. Statistics for Computing
  - 1.6.1. Statistical Concepts for Computing in Bioinformatics
  - 1.6.2. Use Case: MARN Microarrays
  - 1.6.3. Imperfect Data. Statistical Errors: Randomness, Approximation, Noise and Assumptions
  - 1.6.4. Error Quantification: Precision and Sensitivity
  - 1.6.5. Clustering and Classification
- 1.7. Data Mining
  - 1.7.1. Mining and Data Computing Methods
  - 1.7.2. Infrastructure for Data Mining and Computing
  - 1.7.3. Pattern Discovery and Recognition
  - 1.7.4. Machine Learning and New Tools
- 1.8. Genetic Pattern Matching
  - 1.8.1. Genetic Pattern Matching
  - 1.8.2. Computational Methods for Sequence Alignments
  - 1.8.3. Pattern Matching Tools
- 1.9. Modelling and Simulation
  - 1.9.1. Use in the Pharmaceutical Field: Drug Discovery
  - 1.9.2. Protein Structure and Systems Biology
  - 1.9.3. Available Tools and Future
- 1.10. Collaboration and Online Computing Projects
  - 1.10.1. Grid Computing
  - 1.10.2. Standards and Rules Uniformity, Consistency and Interoperability
  - 1.10.3. Collaborative Computing Projects

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 is the most widely used learning system in the best faculties in the world. 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 program, the studies 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 8 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.



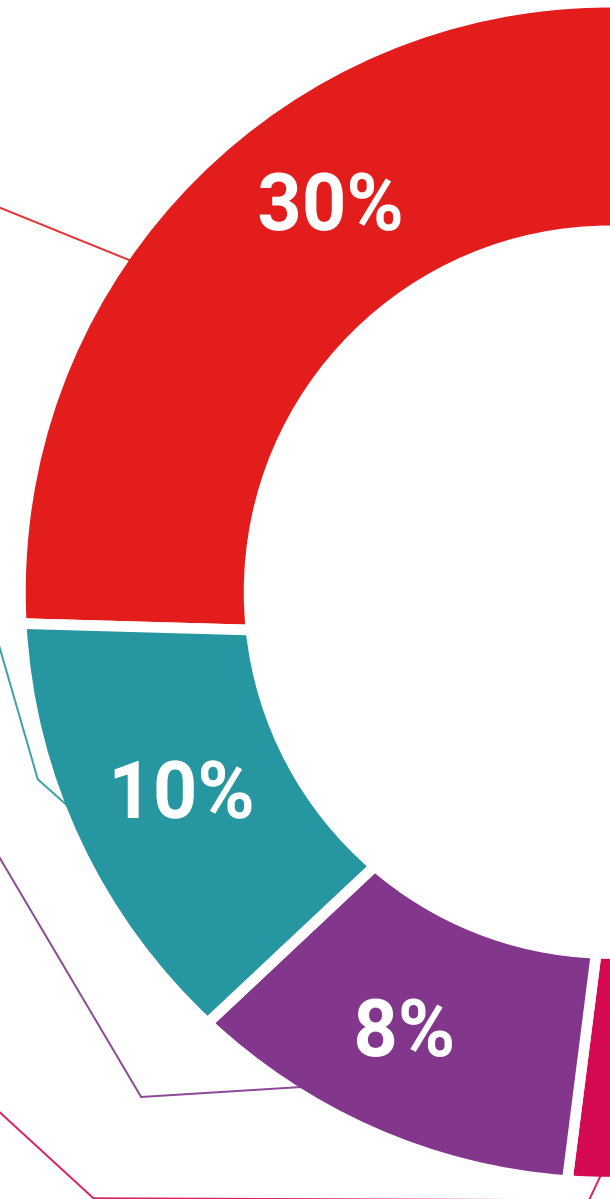
### Practising Skills and Abilities

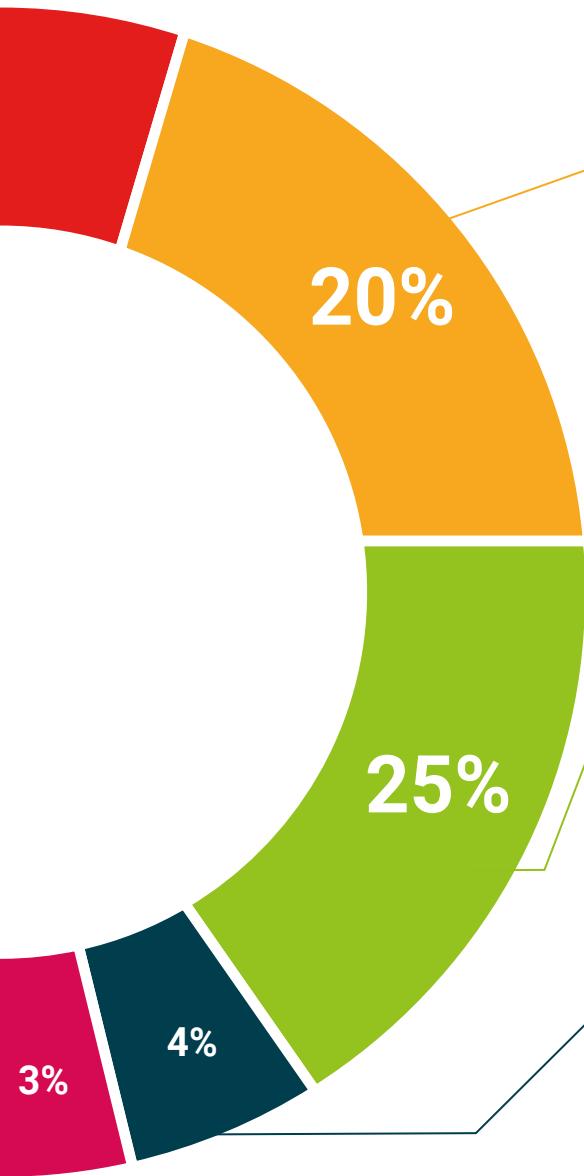
They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### 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 Bioinformatics Computing: Medical Process Digitization and Automation guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University..



“

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

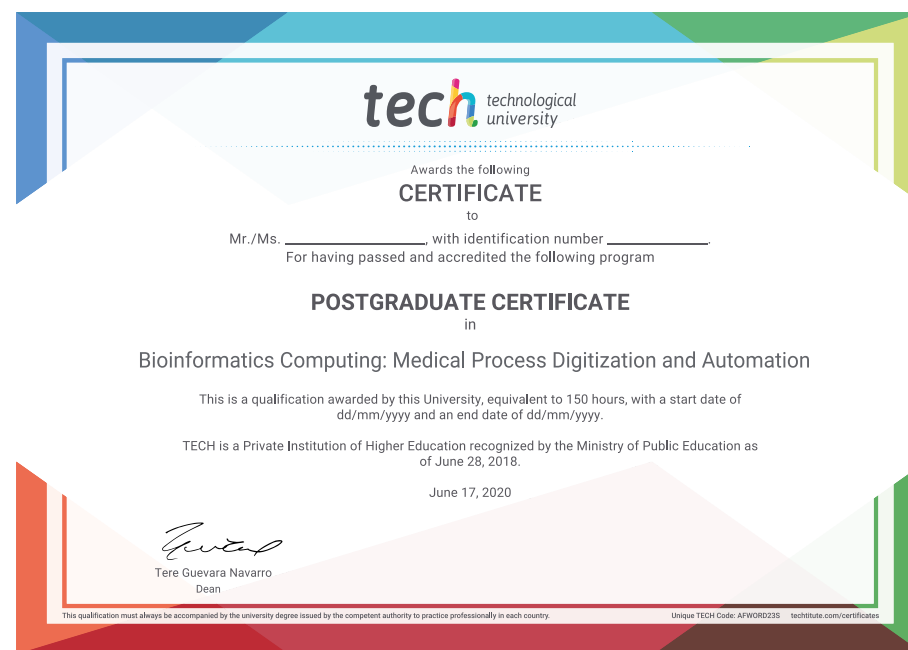
This **Postgraduate Certificate in Bioinformatics Computing: Medical Process Digitization and Automation** contains the most complete and up-to-date program on the market.

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 Bioinformatics Computing: Medical Process Digitization and Automation**

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.

future  
health confidence people  
education information tutors  
guarantee accreditation teaching  
institutions technology learning  
community commitment  
personalized service innovation  
knowledge present quality  
online training  
development languages  
virtual classroom



**Postgraduate Certificate**  
Bioinformatics  
Computing: Medical Process  
Digitization and Automation

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

# Postgraduate Certificate

Bioinformatics

Computing: Medical Process

Digitization and Automation

