

Postgraduate Certificate

Bioinformatics Computing: Digitalization and Automation of Medical Processes





Postgraduate Certificate Bioinformatics Computing: Digitalization and Automation of Medical Processes

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

Website: www.techtute.com/us/nursing/postgraduate-certificate/bioinformatics-computing-digitalization-automation-medical-processes

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01

Introduction

Bioinformatics computing and other digitalization processes have made great advances in the field of medicine. With COVID, tele-assistance was necessary and interactive medical platforms, teleconsultation and virtual assistance made it possible. This digital transformation experienced in the clinical field has allowed healthcare without geographical barriers and has even provided a solution for those patients who cannot travel when suffering from various pathologies. Taking into account the future prospects of these means, specialists oriented to data automation are in great demand by all types of companies and institutions. TECH has developed a complete and innovative program that delves into the advances in computing, bioinformatics and Big Data. Its 100% online mode provides great flexibility to the study so that students can adapt the pace to their personal and professional possibilities.

“

Thanks to this Postgraduate Certificate you will be able to delve into the technological applications in bioinformatics and the automation of medical processes in only 6 weeks”

Bioinformatics is a discipline that has gained great value in recent years. With the management of COVID cases, it has turned out to be the star tool in clinical registry processes, which has made it possible to gather, analyze, compare and interpret data worldwide. Computing has greatly improved the handling of biological data and has enabled progress in the digitization of healthcare. It is a multidisciplinary specialty that has provided information on the solution to pathologies in the clinical context. For this reason, specialists wishing to work in this field must master molecular biology, genetics, computer science and mathematics.

Given the great demand from healthcare companies for highly qualified professionals who know how to adapt to the new times, TECH has developed a course focused on the digitization of medical processes. The Postgraduate Certificate in Bioinformatics Computing offered by TECH covers data management, the application of search engines in bioinformatics, the comparison of genetic patterns and data mining, among many other issues. All this, so that healthcare professionals of the future will have a high degree of knowledge in computing and new technologies applied to the clinical field.

This program is offered in a 100% online mode to make it easier for students. Thanks to its digital features, specialists will be able to access the materials wherever and whenever they want with an Internet connection and without having to travel. In addition, TECH has an experienced teaching team in ICTs and e-Health to impart all the theoretical knowledge to students and share their experience in the real field of action. A unique opportunity for those specialists who believe in the advancement of the health service and bet on innovative academic processes.

This **Postgraduate Certificate in Bioinformatics Computing: Digitalization and Automation of Medical Processes** 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 Computing in Bioinformatics
- The graphic, schematic and eminently practical contents with which it is conceived gather scientific and practical information on those disciplines that are indispensable 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

“*Become a multidisciplinary professional who masters clinical informatics and improves your skills in your daily work*”

“*Have you not yet mastered the tools that automate clinical care? Get to know them easily and 100% online, thanks to TECH*”

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 course. For this purpose, students will be assisted by an innovative interactive video system created by renowned and experienced experts.

Collaborate in online computing projects, knowing the standards and rules of this discipline with a future perspective.

Enter a booming sector and delve into machine learning with the support of experts developing in bioinformatics.



02 Objectives

The main objective of this Postgraduate Certificate is to broaden the knowledge of graduates in Nursing and other health disciplines in bioinformatics computing. By taking this program, students will update their knowledge, delving into the different statistical and computational models for the management of biological information. Therefore, after obtaining the degree, students will be prepared to access jobs related to the biological and health sector, thanks to the skills acquired with TECH.

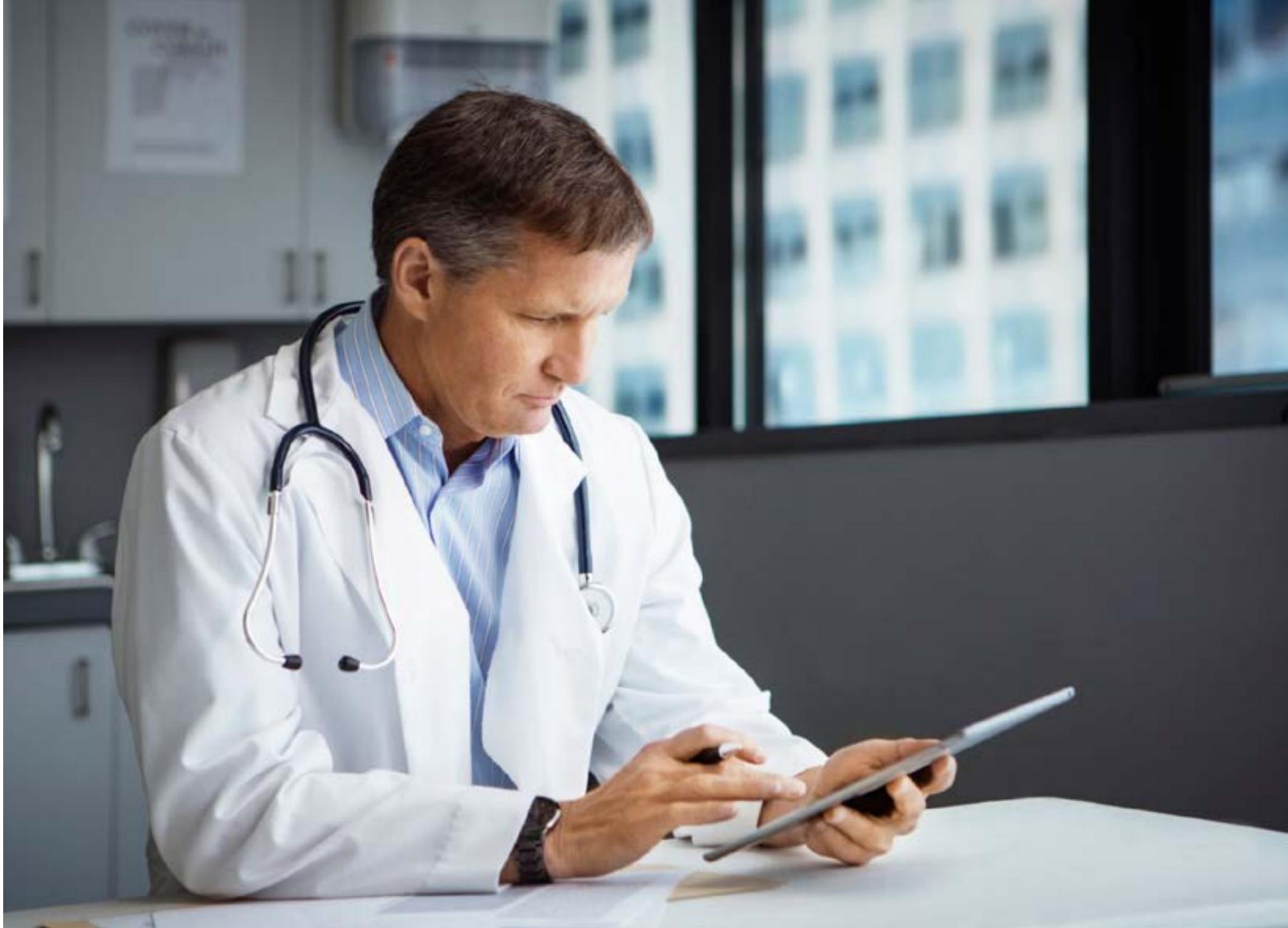


Learn the importance of applying computational biology in the current medical context and develop with confidence in your professional field"



General Objectives

- 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

- Understand the concept of computing
- 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 using Big Data techniques



With this program you will obtain all the knowledge to become a Big Data specialist and you will do it through a 100% online modality without having to travel"

03

Course Management

In response to the strong demand in the healthcare labor market, TECH has turned to experts in the area of bioinformatics to offer a rigorous program, based on solid knowledge. With this teaching collaboration, TECH aims to bring the concepts of computational technologies in research work and its professional applications to the specialists studying this program. In addition, students will have a direct communication channel through which they will be able to contact the teachers to solve any questions about the syllabus. In this way, students will obtain great skills that they will be able to develop in the real field of action, while they are studying or once they have obtained the degree.



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Don't wait any longer, specialize with an expert team in data mining to master bioinformatics and improve your professional skills”

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 Department of the Clinical University of Navarra
- Degree in Biomedical Engineering from the University of Navarra
- MBA and Leadership in Healthcare and Medical Technology Companies

Professors

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



Structure and Content

The syllabus of this program has been developed by a teaching team specialized in bioinformatics, which has years of experience in the health sector. Thanks to their experience, TECH offers guaranteed contents that will instruct students in depth. Through this pathway, specialists will learn about the latest developments in the handling and management of biological data with information technologies and statistical models and will, in turn, delve into the techniques involved in computation and their applications in genetic studies. In addition, the program imparts the knowledge through videos, case studies and interactive summaries, among many exercises.

“

Enroll now in a fully online program with a host of virtual tools that make this a Postgraduate Certificate, a complete and comprehensive program”

Module 1. Computing 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. Modeling 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 Study Methodology

TECH is the world's first university to combine the case study methodology with Relearning, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.

“

TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

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*At TECH you will NOT have live classes
(which you might not be able to attend)”*



The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

“

TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want”

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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.



A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.

“

The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”

The effectiveness of the method is justified by four fundamental achievements:

1. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that assess real situations and the application of knowledge.
2. Learning is solidly translated into practical skills that allow the student 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.



The university methodology top-rated by its students

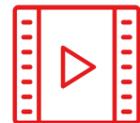
The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the quality of teaching, quality of materials, course structure and objectives is excellent. Not surprisingly, the institution became the best rated university by its students on the Trustpilot review platform, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.

As such, the best educational materials, thoroughly prepared, will be available in this program:



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. This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



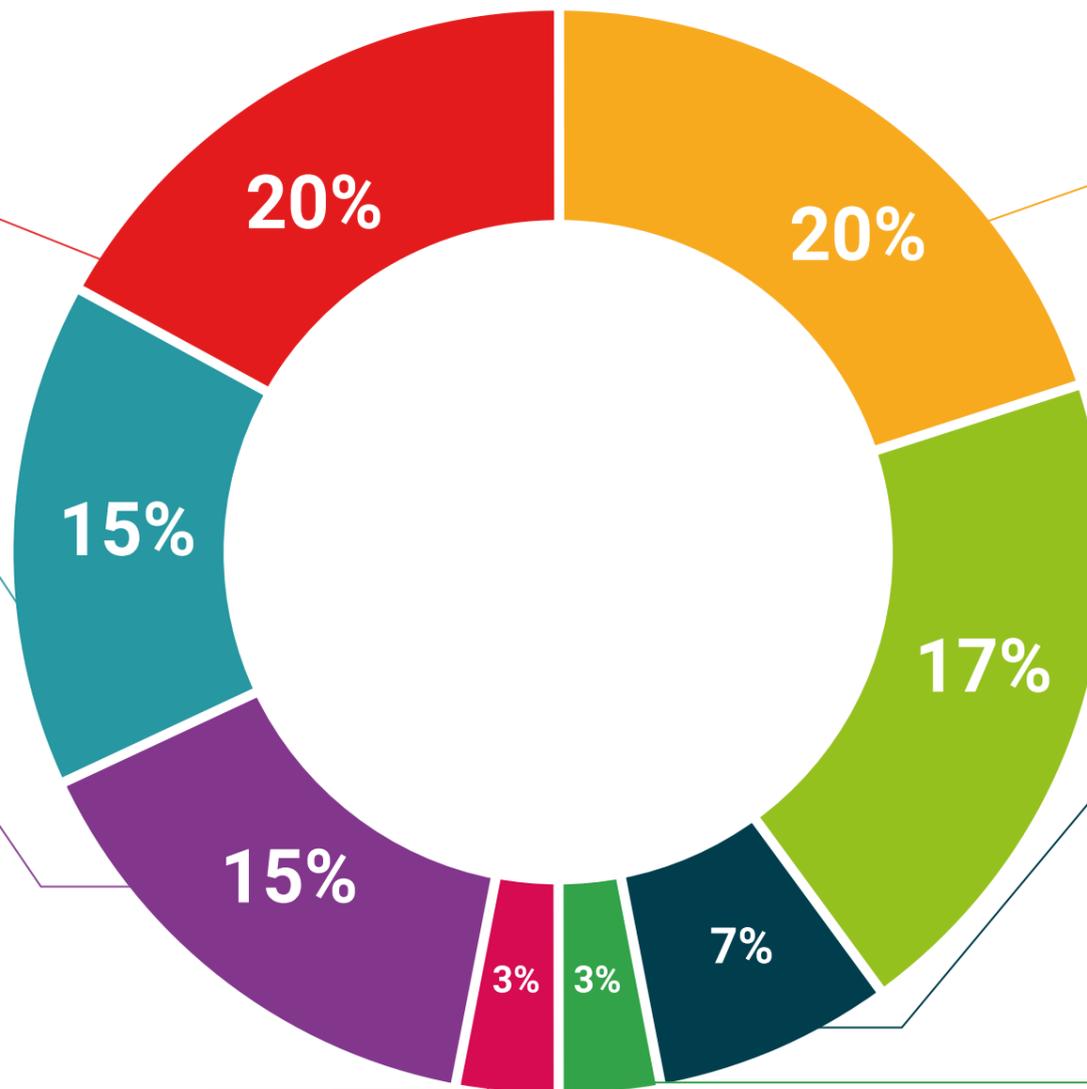
Interactive Summaries

We present 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, international guides... In our virtual library you will have access to everything you need to complete your education.



Case Studies

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



Testing & Retesting

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



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 for 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

This Postgraduate Certificate in Bioinformatics Computing: Digitalization and Automation of Medical Processes guarantees students, in addition to the most rigorous and up to date education, access to a Postgraduate Certificate issued by TECH Global University.



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

This private qualification will allow you to obtain a **Postgraduate Certificate in Bioinformatics Computing: Digitalization and Automation of Medical Processes** 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** private qualification 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 Bioinformatics Computing: Digitalization and Automation of Medical Processes**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**



*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH Global University 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 commit
personalized service innovation
knowledge present
development languages
classroom



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Postgraduate Certificate

Bioinformatics Computing: Digitalization
and Automation of Medical Processes