Postgraduate Certificate
Big Data in Medicine: Massive Medical Data Processing

tech global university

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Postgraduate Certificate

Big Data in Medicine: Massive Medical Data Processing

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

Website: www.techtitute.com/us/information-technology/postgraduate-certificate/big-data-medicine-massive-medical-data-processing

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Introduction

In medicine, Big Data is of enormous value for analyzing extremely large and varied data sets, such as electronic medical records, clinical images, DNA sequences or patient sensor data. This is why this area needs IT professionals who are fully up to date with the processes for creating and maintaining databases, and this TECH program is the perfect solution. With it, students will delve into the application of Big Data in this field, examining the generation of data in Biomedicine or the problems of data preprocessing. All this in a 100% online format of multiple advantages.

Were you looking for a program that deals with clustering algorithms? With this course you will deepen in its application in omics techniques"

The analysis of large data sets makes it possible to identify patterns and correlations that might go unnoticed by doctors and other health professionals. This is crucial for improving diagnostic accuracy, enabling specialists to make more confident decisions about the treatment of patients. Similarly, this massive data processing helps to better understand the causes of certain diseases and to develop new therapies to address them.

Given that Big Data requires IT professionals to implement the different processes and programming, they will find with this TECH Postgraduate Certificate a unique specialization that gathers the latest advances in this field of so much potential. Undoubtedly, a high preparation that will allow them to make a difference after analyzing data flows in biomedical research and*High-throughput*.technology.

Additionally, they will examine in detail the methods and approaches of data preprocessing in Big Data, and then delve into structural and functional genomics and transcriptomics. Students will have all this and more at their fingertips through an avant-garde program in which they will not have to spend a single day in on-site centers. In fact, they will be able to set their own academic times, always advised by great experts in this field.

This **Postgraduate Certificate in Big Data in Medicine, Massive Medical Data Processing** contains the most complete and updated educational program on the market. It's most outstanding features are:

- The development of case studies presented by experts in Big Data in Medicine
- 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 process of 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

The perfect opportunity to become proficient in transcriptomics mass data acquisition techniques such as RNA-seq"

Enroll to be part of a phenomenon that is streamlining medical care and the recording of diseases and their symptoms"

A highly comprehensive specialization in which you will increase your professional background by examining Interactomics and Epigenomics.

You will become a reference in the analysis of Mass Spectrometry data.

The program's faculty includes professionals in the field who bring to this training the experience of their work, as well as renowned 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.

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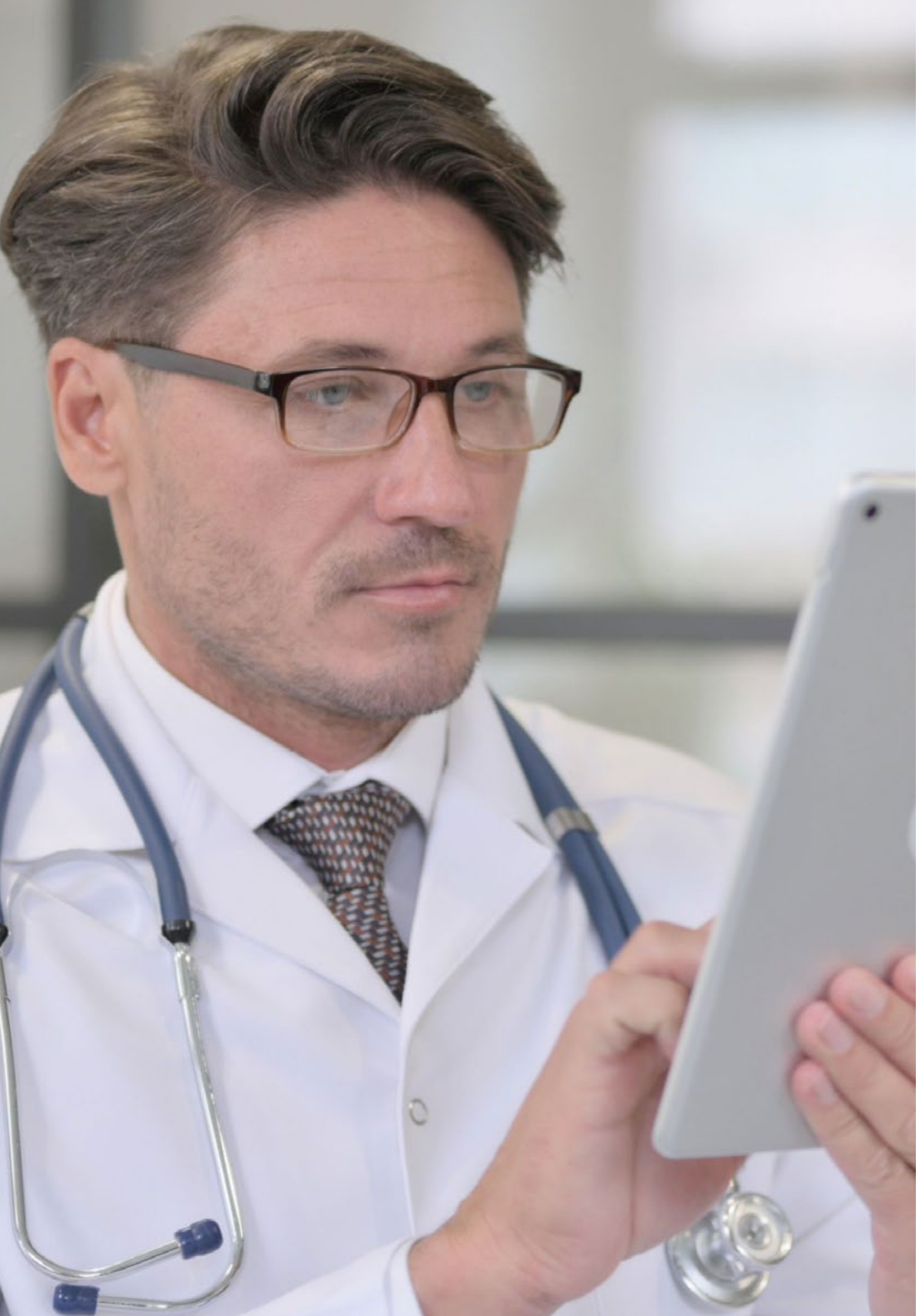
Objectives

This Postgraduate Certificate was created with the aim of providing computer scientists with the most advanced and updated tools to be able to implement with guarantees the processes inherent to Big Data in Medicine. In this way, they will master any aspect of massive database processing in this field, undergoing demanding practical cases in which they will have to test their skills with the support of innovative educational technologies.

The objectives of the Postgraduate Certificate will allow you to master key repositories such as Gene Ontology and KEGG"

General Objectives

- 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
- 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 e-Health success stories and mistakes to avoid
- Apply the knowledge acquired to an original business idea



Specific Objectives

- Gain specialized knowledge of massive data acquisition techniques in biomedicine
- Analyze the importance of data preprocessing in Big Data
- Determine the differences that exist between the data of the different techniques of massive data collection, as well as their special characteristics in terms of preprocessing and data processing.
- Provide ways of interpreting results from massive data analysis
- Examine the applications and future trends in the field of Big Data in biomedical research and public health

You will significantly boost your employability as a computer scientist by opening you up to a field with a potential that has reached unimagined heights"

03

Course Management

One of the greatest guarantees of this Postgraduate Certificate is in its teaching team, made up of prestigious experts in Biomedicine and Big Data. Not in vain, these professors have developed a meritorious research career in which they have made major contributions in journals of wide scope. Additionally, they are eager to be closely involved in the academic progress of students, providing them with all the keys they need to excel in this field.

Experts specialized in Biomedicine and Big Data will provide you with all the keys you need to excel in this area"

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

04

Structure and Content

The syllabus of this program has a differential factor that positions this program over others: it has the most updated and comprehensive vision syllabus on this subject that the student can find in the market. The faculty has played a very important role in this, closely supervising each and every one of the topics so that not a single key concept is left behind. Likewise, the Postgraduate Certificate has been designed in a very efficient way, so that in only 150 hours the student will have completed it, always under the high educational standards that are TECH's hallmark.

A unique syllabus in the market: access from your tablet or PC and examine all aspects of high performance data"

Module 1. Big Data in Medicine: Massive Medical Data Processing

1.1. Big Data in Biomedical Research
- 1.1.1. Data Generation in Biomedicine
- 1.1.2. High-Throughput Technology
- 1.1.3. Uses of High-Throughput Data. Hypotheses in the Age of Big Data

1.2. Data Pre-Processing in Big Data
- 1.2.1. Data Pre-Processing
- 1.2.2. Methods and Approaches
- 1.2.3. Problems with Data Pre-Processing in Big Data

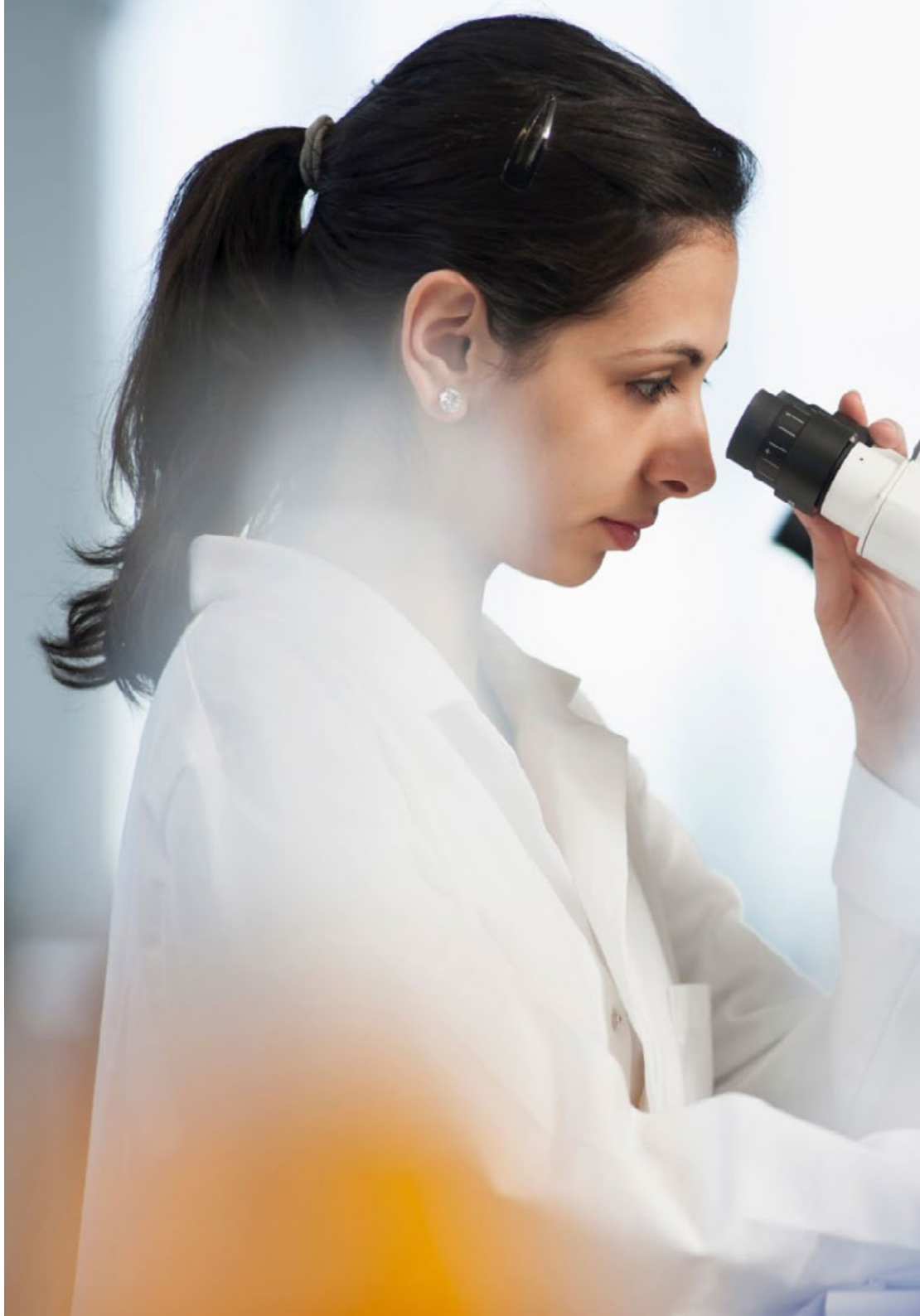
1.3. Structural Genomics
- 1.3.1. Sequencing the Human Genome
- 1.3.2. Sequencing vs. Chips
- 1.3.3. Variant Discovery

1.4. Functional Genomics
- 1.4.1. Functional Notation
- 1.4.2. Mutation Risk Predictors
- 1.4.3. Association Studies in Genomics

1.5. Transcriptomics
- 1.5.1. Techniques to Obtain Massive Data in Transcriptomics: RNA-seq
- 1.5.2. Data Normalization in Transcriptomics
- 1.5.3. Differential Expression Studies

1.6. Interactomics and Epigenomics
- 1.6.1. The Role of Cromatine in Gene Expression
- 1.6.2. High-Throughput Studies in Interactomics
- 1.6.3. High-Throughput Studies in Epigenetics

1.7. Proteomics
- 1.7.1. Analysis of Mass Spectrometry Data
- 1.7.2. Post-Translational Modifications Study
- 1.7.3. Quantitative Proteomics



1.8. Enrichment and Clustering Techniques
- 1.8.1. Contextualizing Results
- 1.8.2. Clustering Algorithms in Omics Techniques
- 1.8.3. Repositories for Enrichment: Gene Ontology and KEGG

1.9. Applying Big Data to Public Health
- 1.9.1. Discovery of New Biomarkers and Therapeutic Targets
- 1.9.2. Risk Predictors
- 1.9.3. Personalized Medicine

1.10. Big Data Applied to Medicine
- 1.10.1. Potential for Diagnostic and Preventive Assistance
- 1.10.2. Use of Machine Learning Algorithms in Public Health
- 1.10.3. The Problem of Privacy

Everything you need to know about the use of Machine Learning algorithms can be found in this program"

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

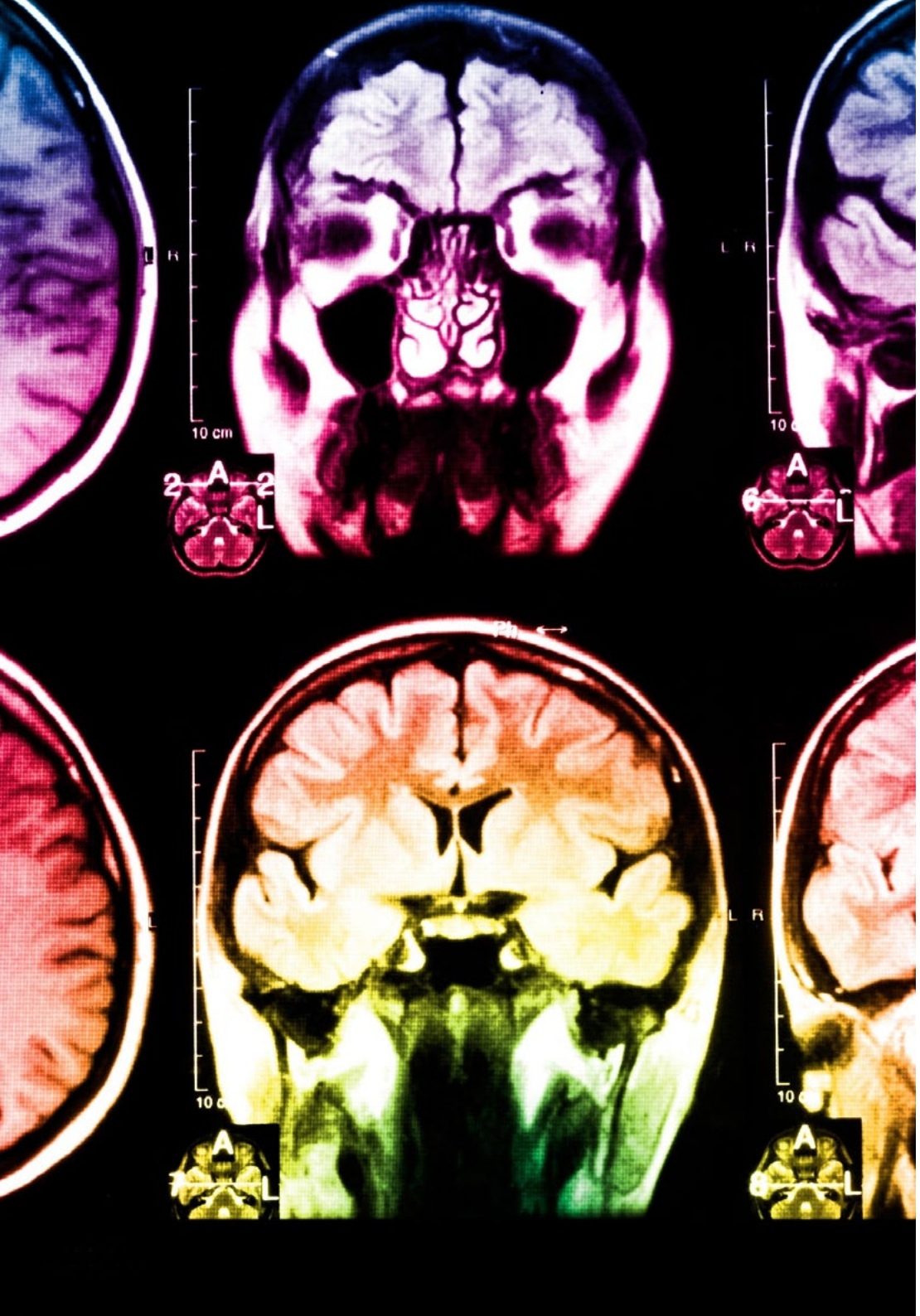
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines different teaching elements in each lesson.

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.

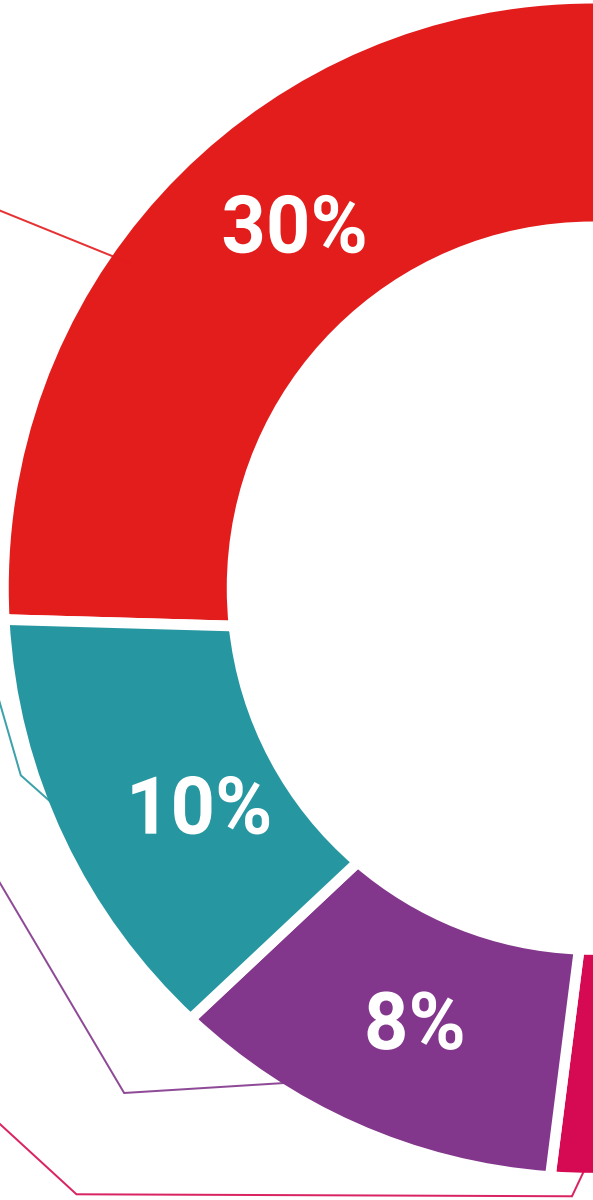
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

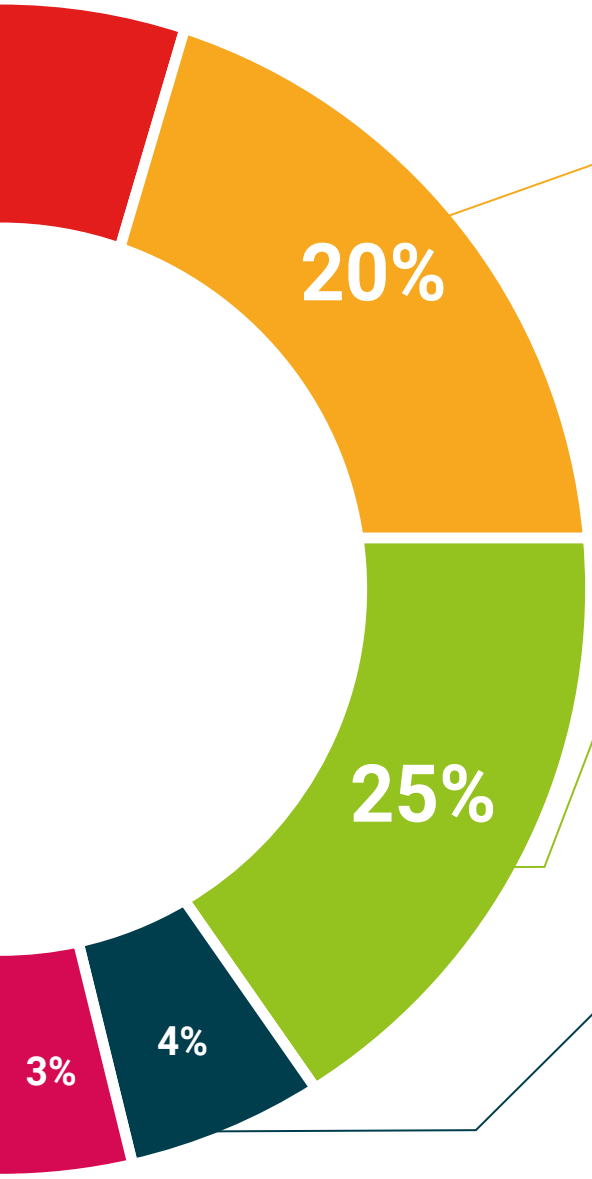
Practising Skills and Abilities

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 Diploma in Big Data en Medicina: Massive Medical Data Processing guarantees, in addition to the most rigorous and updated training, 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 Big Data in Medicine: Massive Medical Data Processing** 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 Big Data in Medicine: Massive Medical Data Processing**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**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Mr./Ms. _____, with identification document _____
has successfully passed and obtained the title of:

Postgraduate Certificate in Big Data in Medicine: Massive Medical Data Processing

This is a private qualification of 180 hours of duration equivalent to 6 ECTS, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH Global University is a university officially recognized by the Government of Andorra on the 31st of January of 2024, which belongs to the European Higher Education Area (EHEA).

In Andorra la Vella, on the 28th of February of 2024

Dr. Pedro Navarro Illana
Dean

Unique TECH Code: AFWORD23S techtitute.com/certificates

*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.

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