Postgraduate Certificate

Big Data in Medicine: Massive Medical Data Processing

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Postgraduate Certificate

Big Data in Medicine: Massive Medical Data Processing

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

Website: **www.techtitute.com/pk/engineering/postgraduate-certificate/big-data-medicine-massive-medical-data-processing**

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01

Introduction

Big Data is capable of creating recurring patterns around the world. This is what medicine is pursuing as it strives to become faster and more effective in providing care. By applying databases, it is possible to identify different types of symptoms in the face of an unknown disease; a reflection of this has been COVID-19. Now there is an imminent record of people who have suffered from it and how they have been able to cope with it. TECH offers this Postgraduate Certificate so that graduates in Engineering are able to streamline data processing with industrial advances, in response to the great demand in the labor market. It is a program taught with a 100% online and flexible modality so that students become experts in the field.

Information gives us power; if you do not know yet the advantages of applying databases in biomedicine and Telemedicine, enroll and put it into practice"

The interest in mastering all the problems that arise in the human environment has led to the emergence of biomedicine. A fusion of sciences that help society to optimize socio-health development. One of the keys in this field is Big Data, which, in particular, has helped to record Covid cases worldwide, bringing scientists in the field closer to studying this virus in more detail.

Given the importance of qualified experts in this field who also know how to put the key tools into practice, TECH has developed a program that provides students with the knowledge of data processing, its treatment and how it contributes to the interpretation of results and medical and pharmacological advances.

TECH is made up of teams of professionals who, in this case, are experts in genomics and genetic studies based on Big Data. Thanks to their experience and the exhaustive attention they offer, the student will have a personalized tutoring that will guarantee the performance and assimilation of the contents. In addition, students will have downloadable materials in different formats so that they can study even without an Internet connection.

This **Postgraduate Certificate in Big Data in Medicine: Massive Medical Data Processing** 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 massive processing of medical databases
- The graphic, schematic, and practical contents with which they are created, provide scientific information on the 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

Enroll to discover the advantages of massive databases in contrasting side effects of millions of drugs"

Thanks to TECH, you will master repositories such as Gene Ontology and KEGG and their intervention towards the optimization of health and social care"

Explore the study of differential data using techniques for obtaining massive data in transcriptomics such as RNA-seq.

Apply Big Data in medicine and learn about the use of Machine Learning algorithms in public health.

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.

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Objectives

The Postgraduate Certificate in Big Data in Medicine: Massive Medical Data Processing is designed for today's engineers to master the tools of the future. Those who wish to complete their academic studies with an extra in digitization and massive database processing. TECH achieves this through the use of practical scenarios, which will make students fully prepared to apply them in practice. The knowledge can be acquired at any time and from anywhere, according to the 100% online modality used by TECH.

TECH's goal is for you to fulfill yours, project your career with the instruction of experts in the area of medical engineering and become more competitive in the labor market"

General Objectives

- Develop key concepts of medicine that serve as a vehicle to understand clinical medicine
- Determine the major diseases affecting the human body classified by apparatus or systems, structuring each module into a clear outline of pathophysiology, diagnosis, and treatment
- Determine how to obtain metrics and tools for healthcare management
- Understand the basics of basic and translational scientific methodology
- Examine the ethical and best practice principles governing the different types of research in health sciences
- Identify and generate the means of funding, assessing and disseminating scientific research
- Identify the real clinical applications of the various techniques
- Develop the key concepts of computational science and theory
- Determine the applications of computation and its implication in bioinformatics
- Provide the necessary resources to practically apply all the concepts in the modules
- Develop the fundamental concepts of databases
- Determine the importance of medical databases
- Delve into the most important techniques in research
- Identify the opportunities offered by the IoT in the field of e-Health
- 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

Enroll in this Postgraduate Certificate to project your professional career towards the Big Data paradigm, which is being responsible for the streamlining of medical care and the recording of diseases and their symptoms"

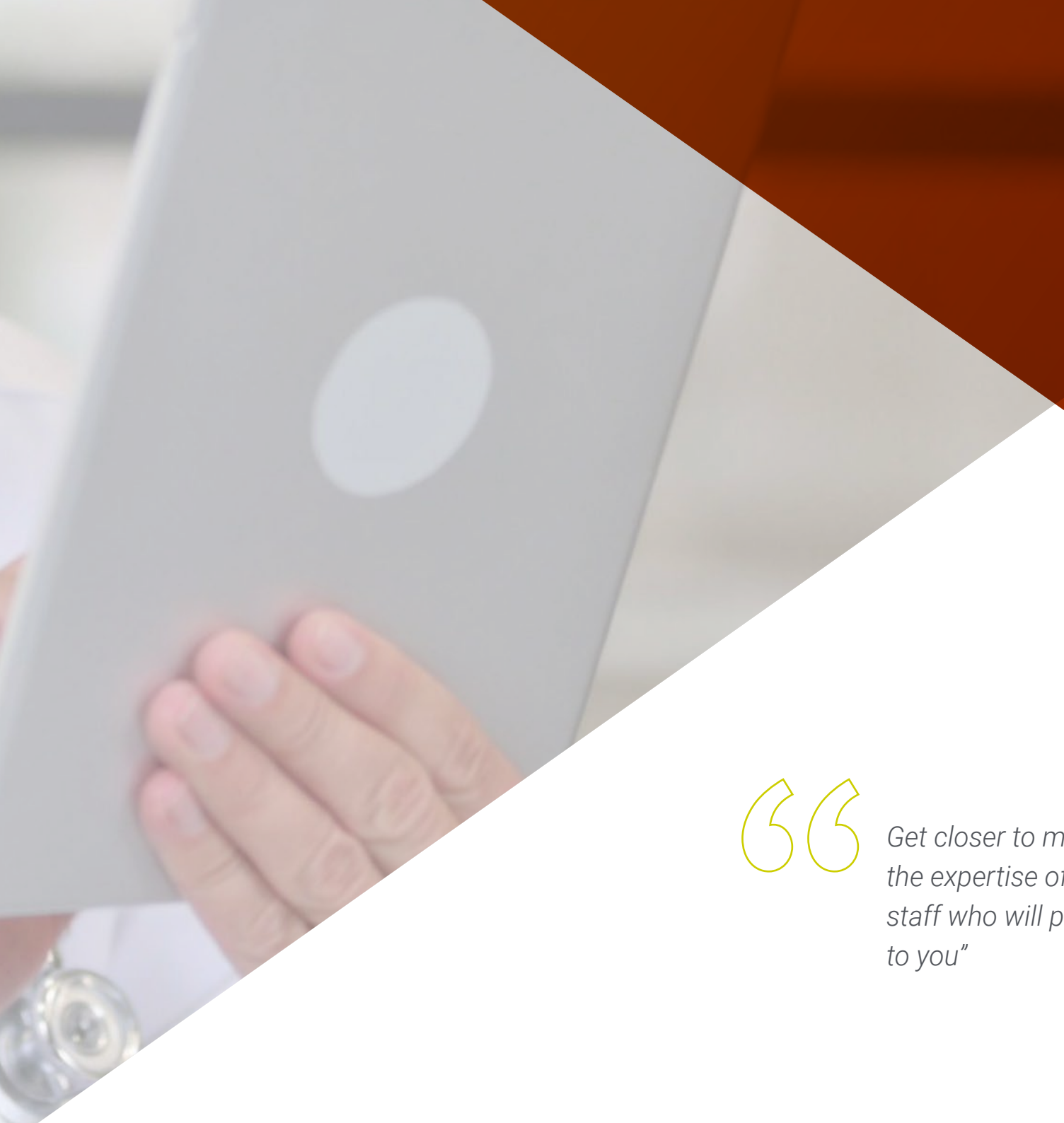
Specific Objectives

- Gain specialized knowledge of massive data acquisition techniques in biomedicine
- Analyze the importance of data preprocessing in Big Data
- Determine the differences between the data derived from different massive data collection techniques, as well as their special characteristics in terms of pre-processing and handling
- 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

03

Course Management

In order to transmit the functioning of Big Data and the benefits of its application in medicine, TECH has called on a professional team versed in biomedicine and Big Data. The professors who teach this program will be at the student's disposal at all times to resolve any questions that may arise. In this way, students will be closely monitored in order to achieve the objectives of the program: Enrich the professional careers of engineering graduates and focus them on future solutions such as data analysis.



Get closer to molecular studies thanks to the expertise of an enlightened teaching staff who will pass on all their knowledge to you"

Management

Ms. Sirera Pérez, Ángela

- Biomedical Engineer expert in Nuclear Medicine and Exoskeleton Design
- Designer of specific parts for 3D printing at Technadi
- Technician in the Nuclear Medicine area of the University Clinic of Navarra
- Degree in Biomedical Engineering from the University of Navarra
- MBA and Leadership in Healthcare and Medical Technology Companies

04

Structure and Content

The syllabus of The Postgraduate Certificate in Big Data in Medicine: Massive Medical Data Processing has been carefully reviewed by experts involved in biomedicine, scientific research and studies in genetics and genomics. These professionals will share all their knowledge about massive data processing through audiovisual materials, with a theoretical-practical format that will allow each student to adapt the pace of study. In addition, TECH applies the Relearning methodology, which will achieve the assimilation of content in a progressive, simple and optimal way, making students forget about memory exercises that require long hours.

Learn about the development of clustering techniques and their role in the contextualization of massive results"

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

A program that will make you delve into the study of omic sciences to understand Big Data as the key to recording the molecules of organisms"

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

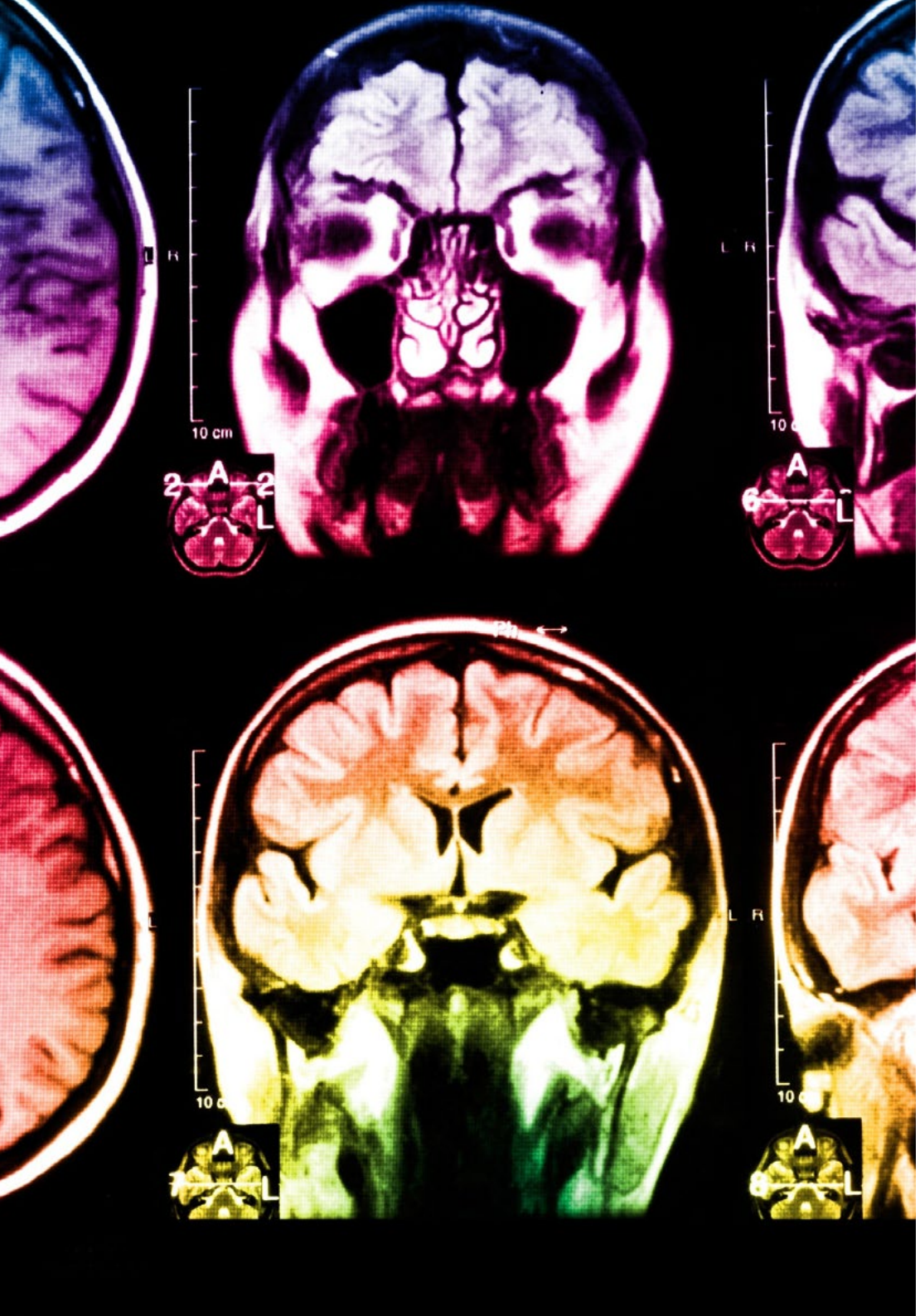
TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

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.

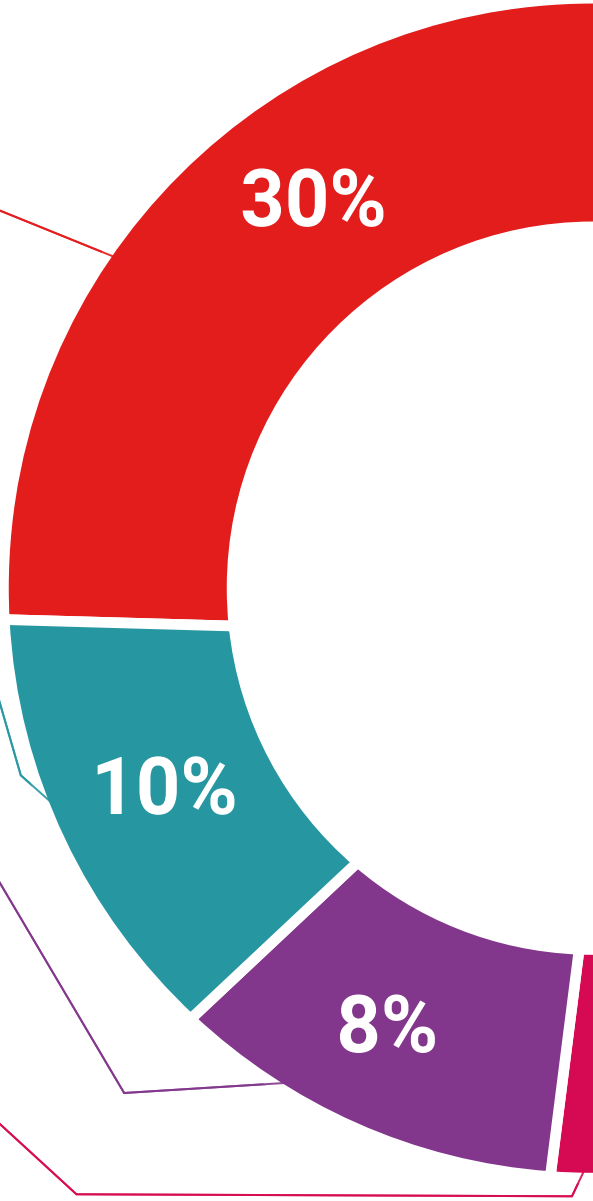
Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.

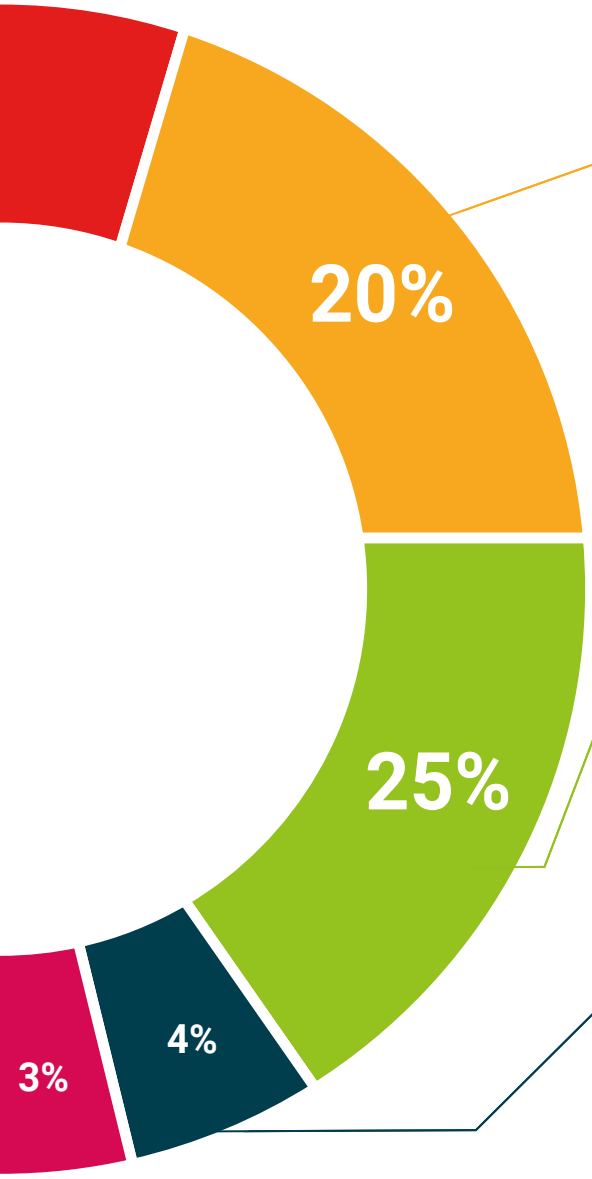
Practising Skills and Abilities

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 Big Data in Medicine: Massive Medical Data Processing 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"

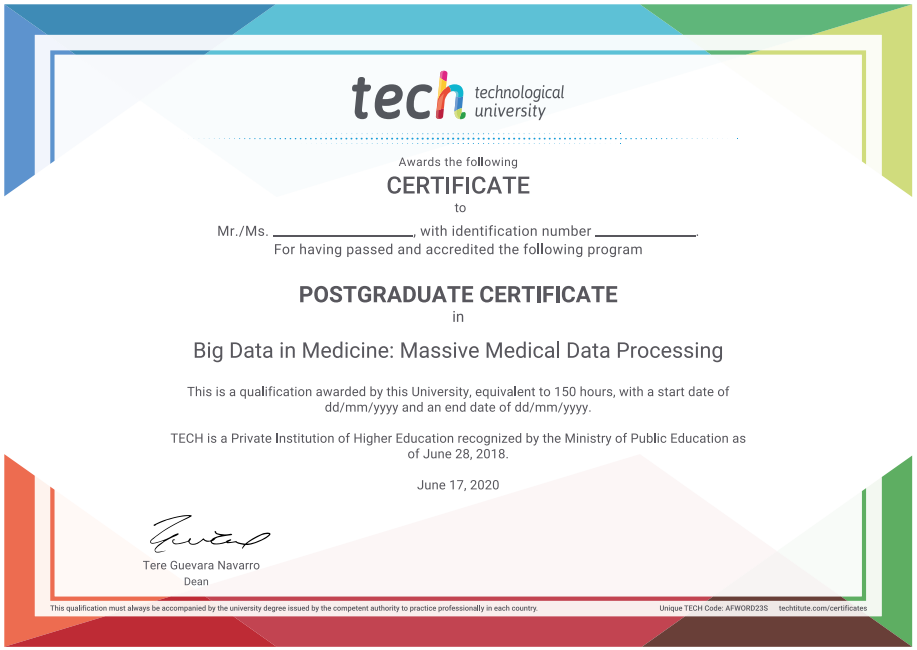
This **Postgraduate Certificate in Big Data in Medicine: Massive Medical Data Processing** contains the most complete and up-to-date program on the market.

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.

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

Official Nº of Hours: **150 h.**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Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Big Data in Medicine: Massive Medical Data Processing

This is a qualification awarded by this University, equivalent to 150 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro
Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

*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.

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