Postgraduate Certificate
Big Data in Medicine: Massive Medical Data Processing

tech global university

![tech global university logo]

Postgraduate Certificate
Big Data in Medicine:
Massive Medical
Data Processing

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

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

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01
Introduction

The pandemic caused by COVID-19 has made society face a completely different reality. In this paradigm shift grows the importance of Big Data within the field of Physiotherapy. The value of this is not so much the amount of data it can provide, but what you do with it, and the growing value of physical therapists who have a thorough understanding of Massive Data Analysis. For this reason, TECH has developed a differential program that delves into the usefulness of High Performance Data, Data Preprocessing, or the Discovery of new Biomarkers and Therapeutic Targets. All this through a 100% online, accessible and flexible course.

Delve deeper into the potential of Big Data in aiding diagnosis and prevention thanks to TECH"

Today, society is not only undergoing major changes in a short period of time, but has also seen an increase in the amount of information it consumes. In many cases it can be an advantage, and in others it can be a problem. A correct interpretation of the data helps to make better diagnoses and, consequently, the physiotherapist will be able to perform a treatment with better results.

Big Data obtains, classifies, manages, and analyzes large amounts of data. Its applications are multiple, but mainly in medicine Big Data is in full growth, bringing to this science new ways to address various situations, whether diagnostics or genome-wide association studies.

As a reflection of this ever-changing society, more and more physiotherapy professionals are looking to update or delve into new techniques and tools. Due to this, TECH promotes this Postgraduate Certificate to equip professionals for continuous advancement and keep them at the forefront of the medical field.

The Postgraduate Certificate in Big Data in Medicine: Massive Medical Data Processing is designed to provide the resources needed to get the most out of it in Physiotherapy. In addition, it addresses the various modalities of massive data collection in biomedical research and which are the most appropriate and up-to-date methodologies. In this way, the graduate is helped to alleviate the lack of resources in research in the field of Physical Therapy, being able to maintain their daily practice.

Being a completely online Postgraduate Certificate, TECH allows the student to set the schedule and manage the entire course load autonomously, since the syllabus is available in its entirety from the first day. In addition, it can be downloaded to any device with an Internet connection. And, of course, with the most cutting-edge methodology on the market today, Relearning.

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

- Development of case studies presented by experts in Massive Medical Data Processing
- 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 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

Make the difference in a sector in full growth such as Big Data"

"*Upgrade yourself in mass data processing and launch your career in Physiotherapy"*

Delve into your knowledge and get the most out of Big Data in Physiotherapy research.

Master data preprocessing, its methods, and approaches, as well as the problems you may encounter.

The program's teaching staff includes professionals from the industry who contribute their work experience to this 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 educational year. For this purpose, the students will be assisted by an innovative interactive video system created by renowned and experienced experts.

02
Objectives

The design of the program of this Postgraduate Certificate will allow the student to acquire the necessary competencies to update in the profession after delving into the key aspects of Massive Medical Data Processing. In this way, with the latest developments in Clustering Algorithms, ohmic techniques, or high-performance studies in interatomic, physiotherapists will be able to apply in their daily practice the most important advances in Big Data, taking a relevant step in their professional career towards this booming field. For this reason, TECH establishes a series of general and specific objectives for the greater satisfaction of future graduates, thanks to its commitment to quality and the latest technologies that have made it a benchmark institution.

Discover the new use of Big Data in Physiotherapy. TECH's goal is for you to delve into all the advantages it can offer you"

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 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 eHealth 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 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

You will even manage the analysis of Mass Spectrometry data and achieve all your professional goals in this Postgraduate Certificate"

03
Course Management

In its maxim of offering an elite education for all, TECH counts on renowned professionals so that the student acquires a solid knowledge in the specialty of Physiotherapy. For this reason, the present Postgraduate Certificate has professionals versed in genomic and radiophysical research, who count on Big Data as one of their great tools for daily practice. In this way, they bring real insight into the interpretation of massive data to the physiotherapist, showing them the way to the future solutions they can provide.

Delve into differential expression studies from knowledgeable experts, taking your Physical Therapy practice to the next level"

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

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Structure and Content

The syllabus of this Postgraduate Certificate in Big Data in Medicine: Massive Medical Data Processing has been thoroughly 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 completely online format that will allow the adaptation of | which ensures the assimilation of content in a progressive, simple and optimal way, making the students forget about memory exercises that require long hours of study.

Get into the study of post-translational modifications with the best experts"

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

A program that will make you stand out among the best thanks to the differential educational material designed by the professionals gathered by TECH"

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"

At TECH we use the Case Method

What should a professional do in a given situation? Throughout the program, students will face multiple simulated clinical cases, based on real patients, in which they will have to do research, establish hypotheses, and ultimately resolve the situation. There is an abundance of scientific evidence on the effectiveness of the method. Physiotherapists/kinesiologists learn better, faster, and more sustainably over time.

With TECH you will experience a way of learning that is shaking the foundations of traditional universities around the world.

According to Dr. Gérvas, the clinical case is the annotated presentation of a patient, or group of patients, which becomes a "case", an example or model that illustrates some peculiar clinical component, either because of its teaching power or because of its uniqueness or rarity. It is essential that the case is based on current professional life, trying to recreate the real conditions of professional physiotherapy practice.

Did you know that this method was developed in 1912, at Harvard, for law students? The case method consisted of presenting students with real-life, complex situations for them to make decisions and justify their decisions on how to solve them. In 1924, Harvard adopted it as a standard teaching method"

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

1. Physiotherapists/kinesiologists who follow this method not only grasp concepts, but also develop their mental capacity, by evaluating real situations and applying their knowledge.

2. The learning process has a clear focus on practical skills that allow the physiotherapist/kinesiologist 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.

Relearning Methodology

At TECH we enhance the case method with the best 100% online teaching methodology available: Relearning.

This university is the first in the world to combine the study of clinical cases with a 100% online learning system based on repetition, combining a minimum of 8 different elements in each lesson, a real revolution with respect to the mere study and analysis of cases.

The physiotherapist/kinesiologist will learn through real cases and by solving complex situations in simulated learning environments. These simulations are developed using state-of-the-art software to facilitate immersive learning.

01 learning from evidence

02 relearning from evidence

03 testing

04 learning from an expert

05 neurocognitive context dependent learning

06 Von-Restorff effect

07 case based learning through storytelling

08 competencies testing (retesting)

At the forefront of world teaching, the Relearning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best online university (Columbia University).

With this methodology we trained more than 65,000 physiotherapists/kinesiologists with unprecedented success in all clinical specialties, regardless of the workload. Our pedagogical methodology is developed in a highly competitive environment, with a university student body with a strong socioeconomic profile and an average age of 43.5 years old.

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.

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.

The overall score obtained by our learning system is 8.01, according to the highest international standards.

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 really 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.

Physiotherapy Techniques and Procedures on Video

TECH brings students closer to the latest techniques, the latest educational advances and to the forefront of current Physiotherapy techniques and procedures. All of this in direct contact with students and explained in detail so as to aid their assimilation and understanding. And best of all, you can watch them as many times as you want.
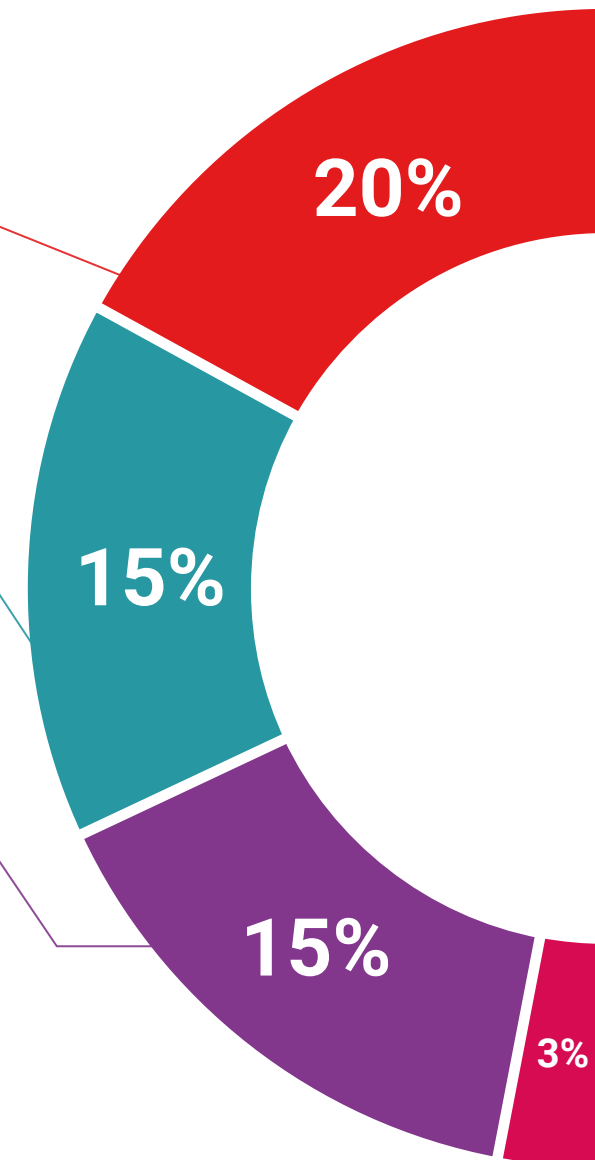
Interactive Summaries

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.
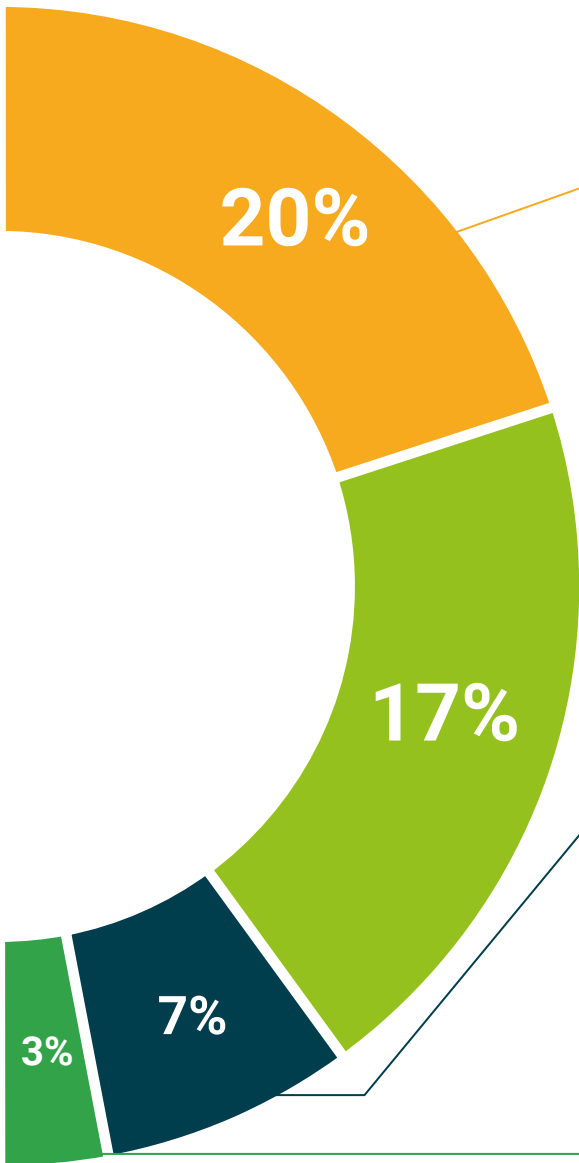
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".

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.

20%

15%

15%

3%

20%

17%

7%

3%

Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, TECH presents real cases in which the expert will guide students, focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.

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.

Classes

There is scientific evidence on the usefulness of learning by observing experts. The system known as Learning from an Expert strengthens knowledge and memory, and generates confidence in 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

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 Global University

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

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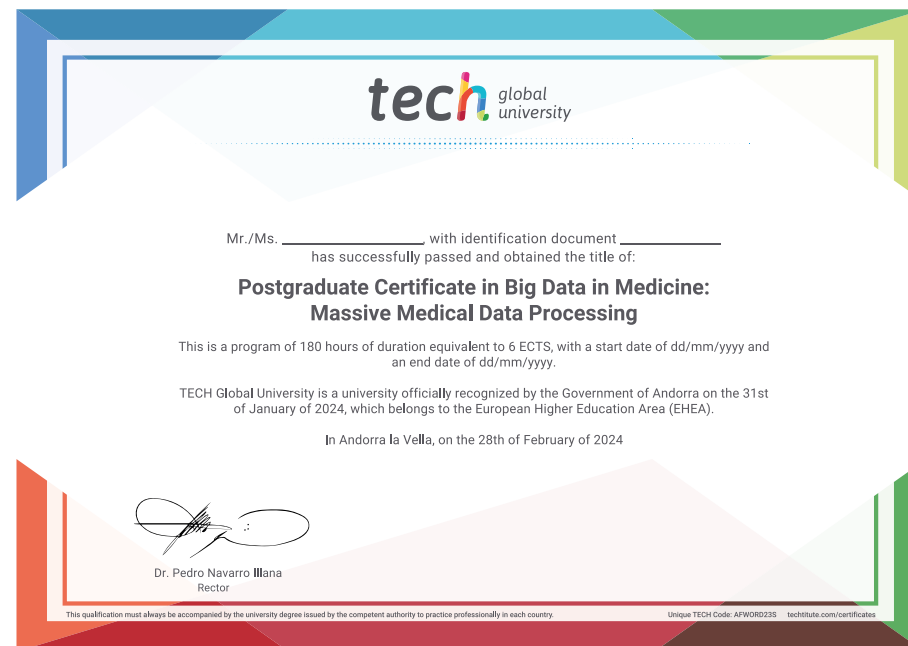
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

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

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**

tech global university

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 program 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
Rector

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 diploma issued with an apostille, TECH Global University will make the necessary arrangements to obtain it, at an additional cost.

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