

Postgraduate Certificate

Exercise-Related Muscular and Metabolic Physiology

Endorsed by the NBA





Postgraduate Certificate Exercise-Related Muscular and Metabolic Physiology

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

Website: www.techtute.com/us/physiotherapy/postgraduate-certificate/exercise-related-muscular-metabolic-physiology

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Certificate

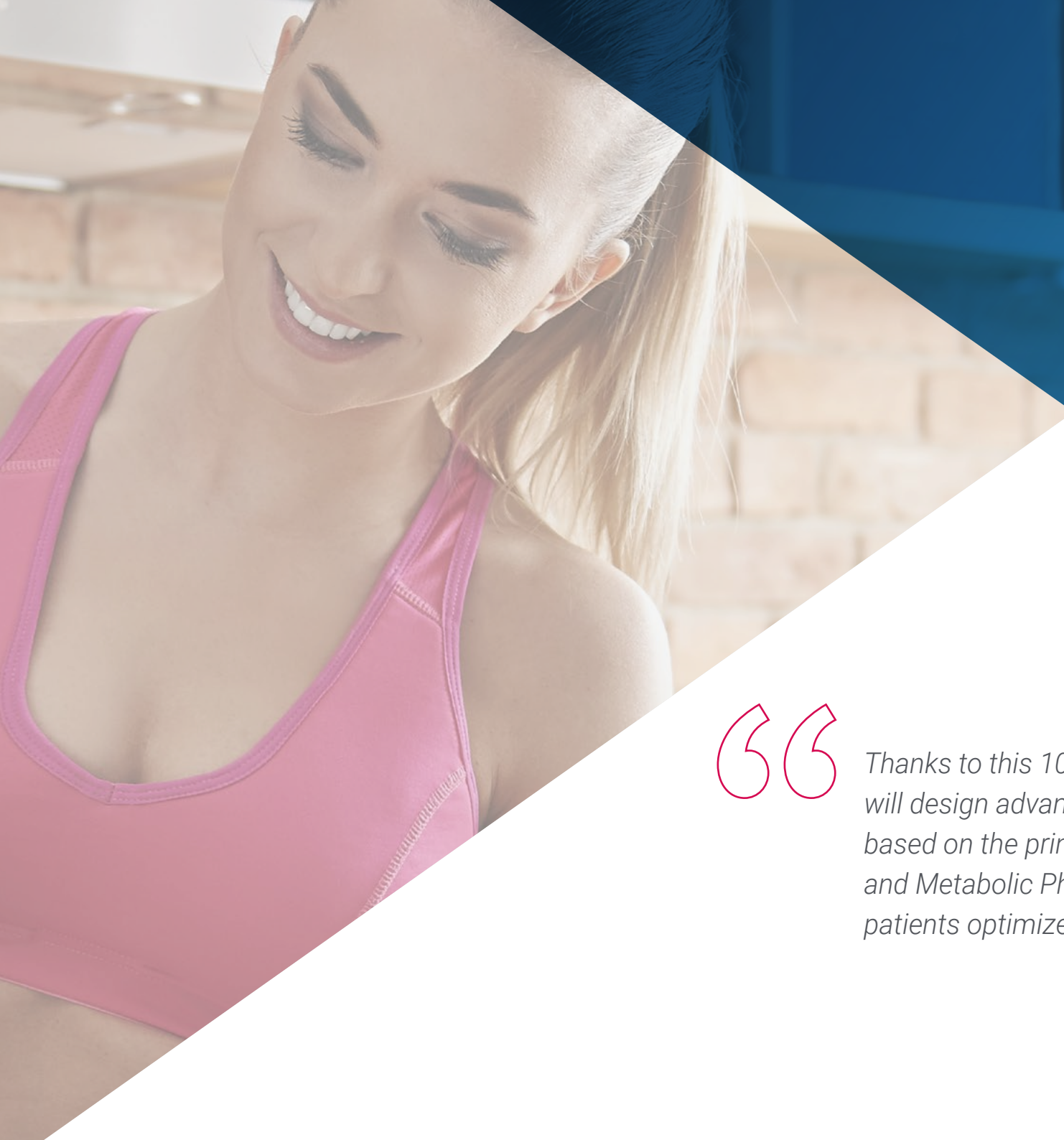
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01

Introduction

Muscular and Metabolic Physiology play a fundamental role in understanding how exercise affects the human body. In this sense, the World Health Organization recognizes that physical inactivity is one of the main risk factors for chronic non-communicable diseases (such as Type 2 Diabetes, cardiovascular pathologies and even some types of Cancer). In this scenario, it is essential that Physiotherapy professionals understand the physiological mechanisms behind sports activity in order to design effective interventions that promote sports performance and prevent muscle injuries. For this reason, TECH is launching a pioneering university program focused on this emerging subject. In addition, the program is delivered in a 100% online format.





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Thanks to this 100% online program, you will design advanced exercise programs based on the principles of Muscular and Metabolic Physiology to help your patients optimize their wellbeing”

Skeletal musculature is not only responsible for the generation of strength and movement, but also plays a crucial role in joint stabilization and injury prevention. In this context, understanding both the physiological processes underlying muscle development and adaptation in response to physical exercise is key to designing effective rehabilitation programs. Therefore, it is important for physical therapists to frequently update their knowledge and skills and stay at the forefront of the latest techniques in the field.

With this in mind, TECH is launching an innovative program in Exercise-Related Muscular and Metabolic Physiology for Physical Therapists. Its objective is to analyze the physiological mechanisms that regulate muscle function during exercise and their relevance to the clinical practice of Physical Therapy. The academic itinerary will delve into the cardiovascular, ventilatory and hormonal adaptations referred to sports practice. In line with this, the syllabus will delve into the structure of muscles, the lactic threshold and phosphagen metabolism. In this way, graduates will gain the skills to perform comprehensive muscle assessments to identify muscle imbalances that require therapeutic interventions. In addition, a distinguished International Guest Director will offer a master class where he will help students develop personalized exercise programs.

On the other hand, the structure of the university program has been designed under the pedagogical methodology of Relearning, which consists of the directed reiteration of the concepts of the syllabus through dynamic academic resources. In addition, it offers a 100% online modality, which means that physiotherapists will be able to access the contents from anywhere in the world and at any time. The only thing specialists will need is an electronic device with an Internet connection to access the Virtual Campus and enjoy the most dynamic academic content on the market.

This **Postgraduate Certificate in Exercise-Related Muscular and Metabolic Physiology** contains the most complete and up-to-date scientific program on the market. The most important features include:

- ♦ The development of practical case studies presented by experts in Sports Nutrition in Specific Populations
- ♦ 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 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



A prestigious International Guest Director will give an enriching Masterclass to analyze the latest scientific postulates in Muscular and Metabolic Physiology”

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You will delve into Phosphagen Metabolism to effectively treat fatigue-related muscle injuries”

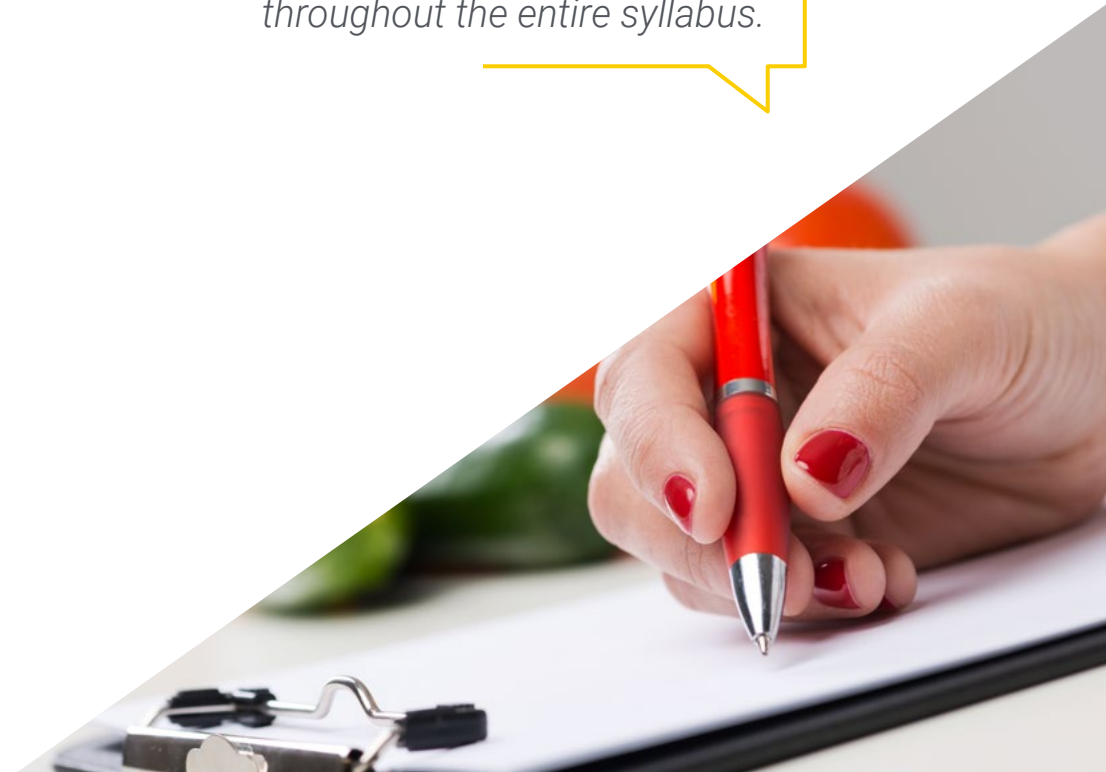
The program's teaching staff includes professionals from the industry who contribute their work experience to this program, as well as renowned specialists from leading societies and prestigious universities.

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

Do you want to acquire skills to interpret and analyze physiological data related to exercise? Achieve it with this program.

You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.



02 Objectives

With this program, physical therapists will have a detailed knowledge of the structure and function of muscles (including how they respond or adapt to physical exercise). At the same time, professionals will develop advanced competencies to design physical activity programs that are based on the principles of Muscular and Metabolic Physiology, keeping in mind both the individual needs and goals of patients. In addition, graduates will be highly qualified to evaluate sports performance using tests and measurements to optimize specialization.



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You will acquire competencies to interpret and analyze exercise-related physiological data, such as heart rate or aerobic capacity”



General Objectives

- ♦ Handle advanced knowledge on nutritional planning in professional and non-professional athletes for the healthy performance of physical exercise
- ♦ Manage advanced knowledge on nutritional planning in professional athletes of various fields in order to achieve maximum sports performance
- ♦ Learn advanced knowledge about nutritional planning in professional athletes from team sports to achieve the highest sports performance
- ♦ Manage and consolidate the initiative, entrepreneurial spirit to implement projects related to nutrition in physical activity and sport
- ♦ Know how to incorporate the different scientific advances into one's own professional field
- ♦ Acquire skills to work in a multidisciplinary environment
- ♦ Gain an advanced understanding of the context in which the area of their specialty is developed
- ♦ Manage advanced skills in the detection of possible signs of nutritional changes associated with sports activities
- ♦ Manage the necessary skills through the teaching-learning process that will allow them to continue specializing and learning in the field of Nutrition in sport, both through the contacts established with teachers and professionals of the Master's Degree as well as independently
- ♦ Specialize in the structure of muscle tissue and its role in sports
- ♦ Gain knowledge about the energetic and nutritional needs of athletes in different pathophysiological situations
- ♦ Specialize in the energetic and nutritional needs of athletes in the different situations specific to age and gender
- ♦ Become a specialist in the dietary strategies for the prevention and treatment of injured athletes
- ♦ Specialize in the energetic and nutritional needs of child athletes



Specific Objectives

- Understand in depth the functioning of skeletal muscle
- Delve into the understanding of the most important changes that occur in athletes
- Delve into the mechanisms of energy production according to the type of exercise undertaken
- Further understanding of the interaction between the different energy systems that make up the muscle energy metabolism

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This refresher program will generate a greater sense of security in the performance of your daily practice as a Physiotherapist”

03

Course Management

To develop this program, TECH has brought together recognized experts in Sports Nutrition in Specific Populations. This distinguished faculty is composed of professionals with a vast background in Exercise-Related Muscular and Metabolic Physiology for Physical Therapists. Thanks to their solid experience in this field, they have created high-level academic materials, adapted to the current demands of the labor market. This represents a guarantee for students, who will benefit from an immersive experience that will significantly boost their professional careers.



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*Learn from leading professionals
the latest advances in Ventilatory
Adaptations related to exercise”*

International Guest Director

Jamie Meeks has demonstrated throughout her career her dedication to Sports Nutrition. After graduating from Louisiana State University with a degree in Sports Nutrition, she quickly rose to prominence. Her talent and commitment were recognized when she received the prestigious Young Dietitian of the Year award from the Louisiana Dietetic Association, an achievement that marked the beginning of a successful career.

After completing her undergraduate degree, Jamie Meeks continued her education at the University of Arkansas, where she completed her internship in Dietetics. She then went on to earn a Master's Degree in Kinesiology with a specialization in Exercise Physiology from Louisiana State University. Her passion for helping athletes reach their full potential and her tireless commitment to excellence make her a leading figure in the sports and nutrition community.

Her deep knowledge in this area led her to become the first Director of Sports Nutrition in the history of Louisiana State University's athletic department. There, she developed innovative programs to meet the dietary needs of athletes and educate them on the importance of proper nutrition for optimal performance.

Subsequently, she has held the position of Director of Sports Nutrition for the NFL's New Orleans Saints. In this role, she is dedicated to ensuring that professional players receive the best nutritional care possible, working closely with coaches, trainers, physical trainers and medical staff to optimize individual performance and health.

As such, Jamie Meeks is considered a true leader in her field, being an active member of several professional associations and participating in the advancement of Sports Nutrition on a national level.

In this regard, she is also a member of the Academy of Nutrition and Dietetics and the Association of Chartered and Professional Sports Dietitians.



Ms. Meeks, Jamie

- Director of Sports Nutrition for the New Orleans Saints of the NFL, Louisiana, U.S.A.
- Sports Nutrition Coordinator at Louisiana State University, Louisiana
- Registered Dietitian by the Academy of Nutrition and Dietetics
- Certified Specialist in Sports Dietetics
- Master's Degree in Kinesiology with specialization in Exercise Physiology from the Louisiana State University
- Graduate in Dietetics from Louisiana State University
- Member of: Louisiana Dietetic Association, Association of Dietitians Collegiate and Professional, and Dietetic Practice Group of Cardiovascular Sports Nutrition and Wellness

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Thanks to TECH you will be able to learn with the best professionals in the world”

Management



Dr. Marhuenda Hernández, Javier

- ♦ Professional soccer clubs Nutritionist
- ♦ Head of Sports Nutrition. Club Albacete Balompie SAD
- ♦ Head of Sports Nutrition. Catholic University of Murcia, UCAM Murcia Football Club
- ♦ Scientific Advisor. Nutrium
- ♦ Nutritional Advisor. Impulse Center
- ♦ Teacher and Coordinator of Postgraduate Studies
- ♦ PhD in Nutrition and Food Safety. San Antonio Murcia Catholic University
- ♦ Degree in Human Nutrition and Dietetics. San Antonio Murcia Catholic University
- ♦ Master's Degree in Clinical Nutrition. San Antonio Murcia Catholic University
- ♦ Academic Academia Española de Nutrición y Dietética (AEND)

Professors

Dr. Arcusa Saura, Raúl

- ♦ Nutritionist. Sport Club Castellón
- ♦ Nutritionist in several semi-professional clubs in Castellón
- ♦ Researcher. San Antonio Murcia Catholic University
- ♦ Undergraduate and Graduate Faculty
- ♦ Graduate in Human Nutrition and Dietetics
- ♦ Master's Degree in Nutrition in Physical Activity and Sport



04

Structure and Content

With this program, physiotherapists will acquire detailed knowledge of the structure and function of muscles and their adaptation to physical exercise. The syllabus will go in depth into cardiovascular, ventilatory and hormonal adaptations related to sports activity. In turn, the syllabus will analyze both muscle structure and types of muscle fibers, which will allow students to accurately assess injuries. The academic content will also examine Mixed Bioenergetics so that graduates can optimize the treatment of muscle injuries and adapt rehabilitation programs to minimize the risk of recurrent injuries.





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You will analyze how muscle function and metabolism interact during physical activity and influence athletic performance”

Module 1. Exercise-Related Muscular and Metabolic Physiology

- 1.1. Cardiovascular Adaptations Related to Exercise
 - 1.1.1. Increased Systolic Volume
 - 1.1.2. Decreased Heart Rate
- 1.2. Ventilatory Adaptations Related to Exercise
 - 1.2.1. Changes in the Ventilatory Volume
 - 1.2.2. Changes in Oxygen Consumption
- 1.3. Hormonal Adaptations Related to Exercise
 - 1.3.1. Cortisol
 - 1.3.2. Testosterone
- 1.4. Muscle Structure and Types of Muscle Fibers
 - 1.4.1. Muscle Fiber
 - 1.4.2. Type I Muscle Fiber
 - 1.4.3. Type II Muscle Fibers
- 1.5. The Concept of Lactic Threshold
- 1.6. ATP and Phosphagen Metabolism
 - 1.6.1. Metabolic Pathways for ATP Resynthesis during Exercise
 - 1.6.2. Phosphagen Metabolism
- 1.7. Carbohydrate Metabolism
 - 1.7.1. Carbohydrate Mobilization during Exercise
 - 1.7.2. Types of Glycolysis
- 1.8. Lipid Metabolism
 - 1.8.1. Lipolysis
 - 1.8.2. Fat Oxidation during Exercise
 - 1.8.3. Ketone Bodies
- 1.9. Protein Metabolism
 - 1.9.1. Ammonium Metabolism
 - 1.9.2. Amino Acid Oxidation
- 1.10. Mixed Bioenergetics of Muscle Fibers
 - 1.10.1. Energy Sources and their Relation to Exercise
 - 1.10.2. Factors Determining the Use of One or Another Energy Source during Exercise





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TECH has the most complete and updated scientific program on the market in the field of Muscular and Metabolic Physiology. What are you waiting for to enroll?"

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.





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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.

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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.

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

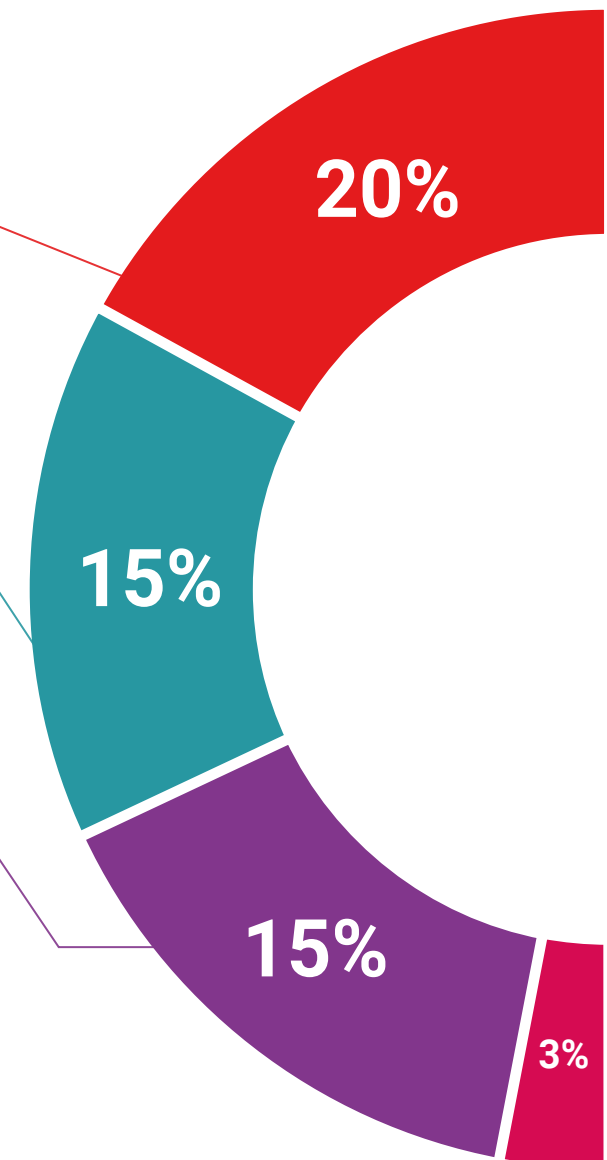
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

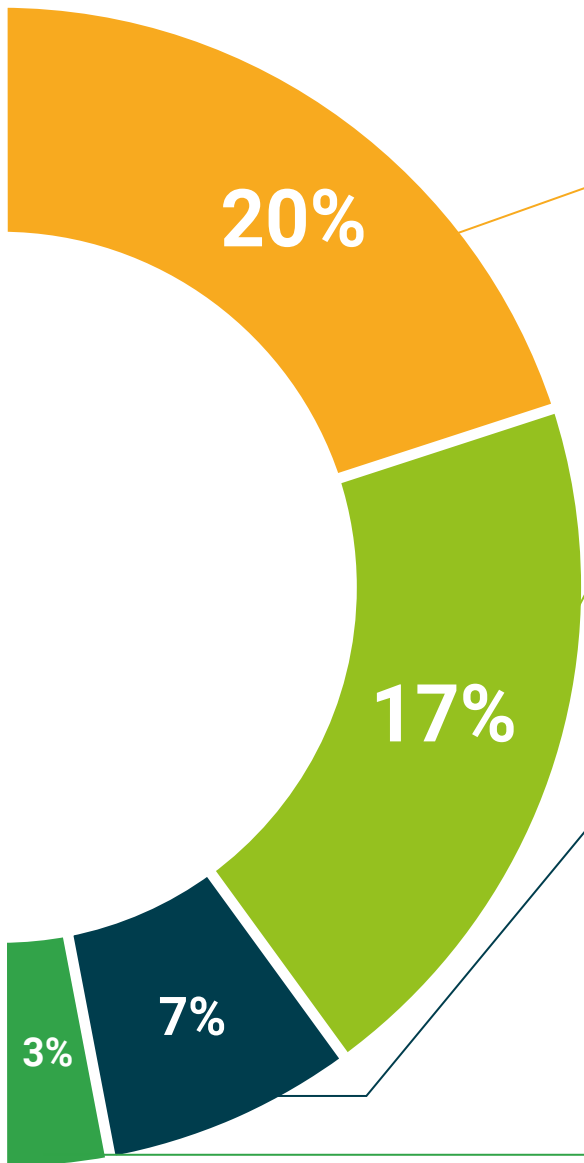
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



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.





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 Exercise-Related Muscular and Metabolic Physiology guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.





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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 a **Postgraduate Certificate in Exercise-Related Muscular and Metabolic Physiology** endorsed by **TECH Global University**, the largest digital university in the world.

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 Exercise-Related Muscular and Metabolic Physiology**

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.



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Postgraduate Certificate

Exercise-Related Muscular and Metabolic Physiology

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