

# Postgraduate Certificate

## Muscular and Metabolic Physiology Related to Exercise



## Postgraduate Certificate

### Muscular and Metabolic Physiology Related to Exercise

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

Website: [www.techtute.com/us/medicine/postgraduate-certificate/muscular-metabolic-physiology-related-exercise](http://www.techtute.com/us/medicine/postgraduate-certificate/muscular-metabolic-physiology-related-exercise)

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# 01

# Introduction

Delve into the mechanisms of energy production based on the type of exercise performed with this complete program designed by experts in the field. The student will be provided with the latest didactic resources and advanced knowledge in a program of high scientific rigor.



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*This 100% online Postgraduate Certificate will allow you to combine your studies with your professional work while increasing your knowledge in this field"*

In this intensive Postgraduate Certificate, the biochemistry and metabolism of exercise is approached from a scientific and practical point of view, partially renouncing the complexity of the subject. It delves into the relationship of the muscle with the rest of the systems integrated in physical activity, as well as the relevance of the different macronutrients in the physiological performance of the muscular system.

This program focuses on the aspects less studied during the university career, allowing to broaden the knowledge necessary to cover a wide spectrum of potential athletes, as well as to meet their nutritional needs. Within this Postgraduate Certificate we can find a teaching staff of the highest level, formed by professionals closely related to sports nutrition, outstanding in their field and who lead lines of research and field work, as well as recognized specialists from leading societies and prestigious universities.

As it is an online Postgraduate Certificate, the student is not constrained by fixed schedules or the need to move to another physical location, but rather, they can access the contents at any time of the day, allowing them to balance their professional or personal life with their academic life as they please.

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

- ◆ The graphic, schematic and practical contents of the course are designed to provide all the essential information required for professional practice
- ◆ Exercises where the self-assessment process can be carried out to improve learning
- ◆ An algorithm-based interactive learning system, designed for decision making for patients with nutritional challenges
- ◆ 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



*Learn the most suitable diets for each type of athlete and you will be able to give more personalized advice"*

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*This Postgraduate Certificate is the best investment you can make in the selection of a refresher program for two reasons: in addition to updating your knowledge in sports nutrition, you will obtain a program for: TECH Global University"*

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.

*Food and sport must go hand in hand, as it is essential that athletes follow a proper diet to help them improve their performance.*

*Immerse yourself in this comprehensive Professional Postgraduate Certificate and improve your skills in nutritional counseling for athletes.*



# 02 Objectives

The principal objective of the program is the development of both theoretical and practical learning, so that the professional can master, in a practical and rigorous way, the study of sports nutrition in special population groups.





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*This refresher program will generate a sense of security in the performance of your daily practice, which will help you grow personally and professionally"*



## General Objectives

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- ◆ 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 and 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
- ◆ Working in a multidisciplinary environment
- ◆ Understand 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 training and learning in the field of Sports Nutrition both through the contacts established with professors and professionals of this Training as well as in an autonomous way
- ◆ Specialize in the structure of muscle tissue and its role in sports
- ◆ Know 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
- ◆ Specialize in the energetic and nutritional needs of Paralympic athletes



## Specific Objectives

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- ◆ Gain an in-depth understanding of the structure of skeletal muscle
- ◆ 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 carried out
- ◆ Further understanding of the interaction between the different energy systems that make up the muscle energy metabolism

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*Our goal is to achieve  
academic excellence and  
to help you achieve it too”*

03

# Course Management

The teaching team who are experts in Sports Nutrition, are highly regarded in the profession and are professionals with years of teaching experience who have come together to help the student boost to their career. To this end, they have developed this Postgraduate Certificate with recent updates on the subject that will allow you to professionals with the train and increase your skills in this sector.





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*Learn from the best professionals and  
become a successful professional yourself”*

## International Guest Director

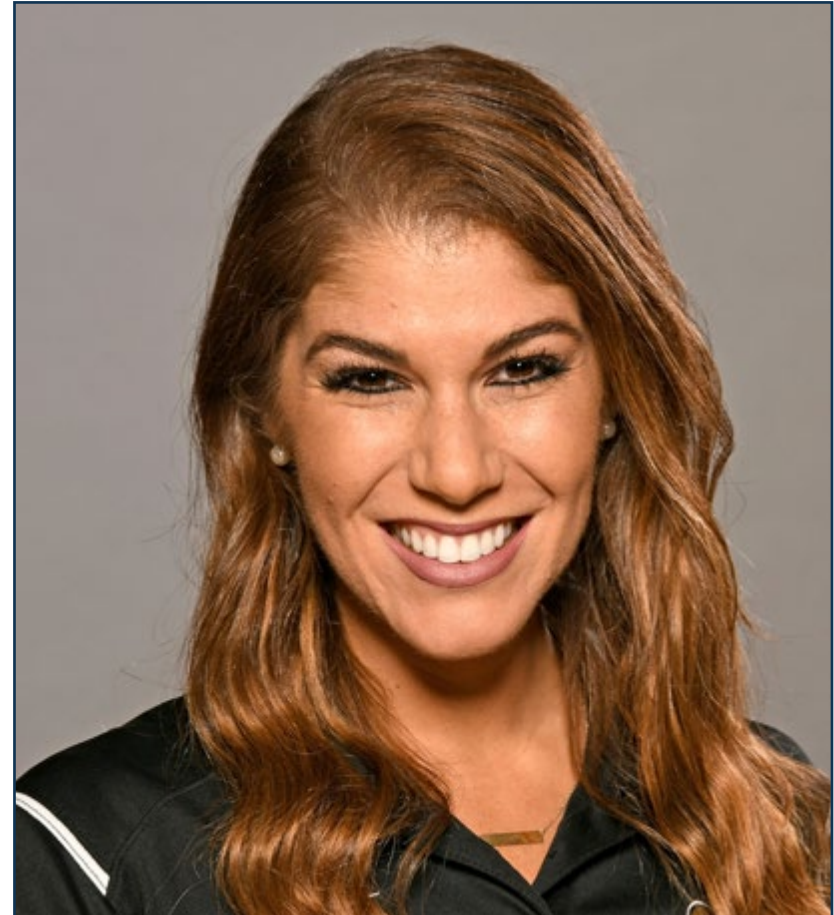
Jamie Meeks has proven throughout her career her dedication to Sports Nutrition. After graduating from Louisiana State University with a degree in Sports Nutrition, he quickly rose to prominence. Her talent and commitment were recognized when she received the prestigious Young Dietitian of the Year award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

After completing her bachelor's degree, Jamie Meeks continued her education at the University of Arkansas, where she completed her internship in Dietetics. She then went on to obtain 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 Collegiate and Professional Sports Dietitians.



## Dra. Meeks, Jamie

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

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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

- ♦ Fellow of the Spanish Academy of Human Nutrition and Dietetics
- ♦ Professor and researcher at the Catholic UCAM University San Antonio in Murcia
- ♦ Ph.D. in Nutrition
- ♦ Master's Degree in Clinical Nutrition
- ♦ Graduate in Nutrition

## Professors

### Dr. Arcusa, Raúl

- ♦ Graduate in Human Nutrition and Dietetics
- ♦ Master's Degree in Nutrition in Physical Activity and Sport
- ♦ Anthropometrist ISAK level 1
- ♦ He is currently a doctoral student at the Department of Pharmacy of the UCAM, in the research line of Nutrition and Oxidative Stress, activity that he combines with his work as a nutritionist in the youth team of C.D. Castellón
- ♦ Possesses experience in different soccer teams in the Valencian community, as well as extensive experience in face-to-face clinical consultation





# 04

# Structure and Content

The structure of the contents has been designed by a team of professionals knowledgeable about the implications of education in daily practice, aware of the current relevance of specialization in Sports Nutrition; and committed to quality teaching through new educational technologies.

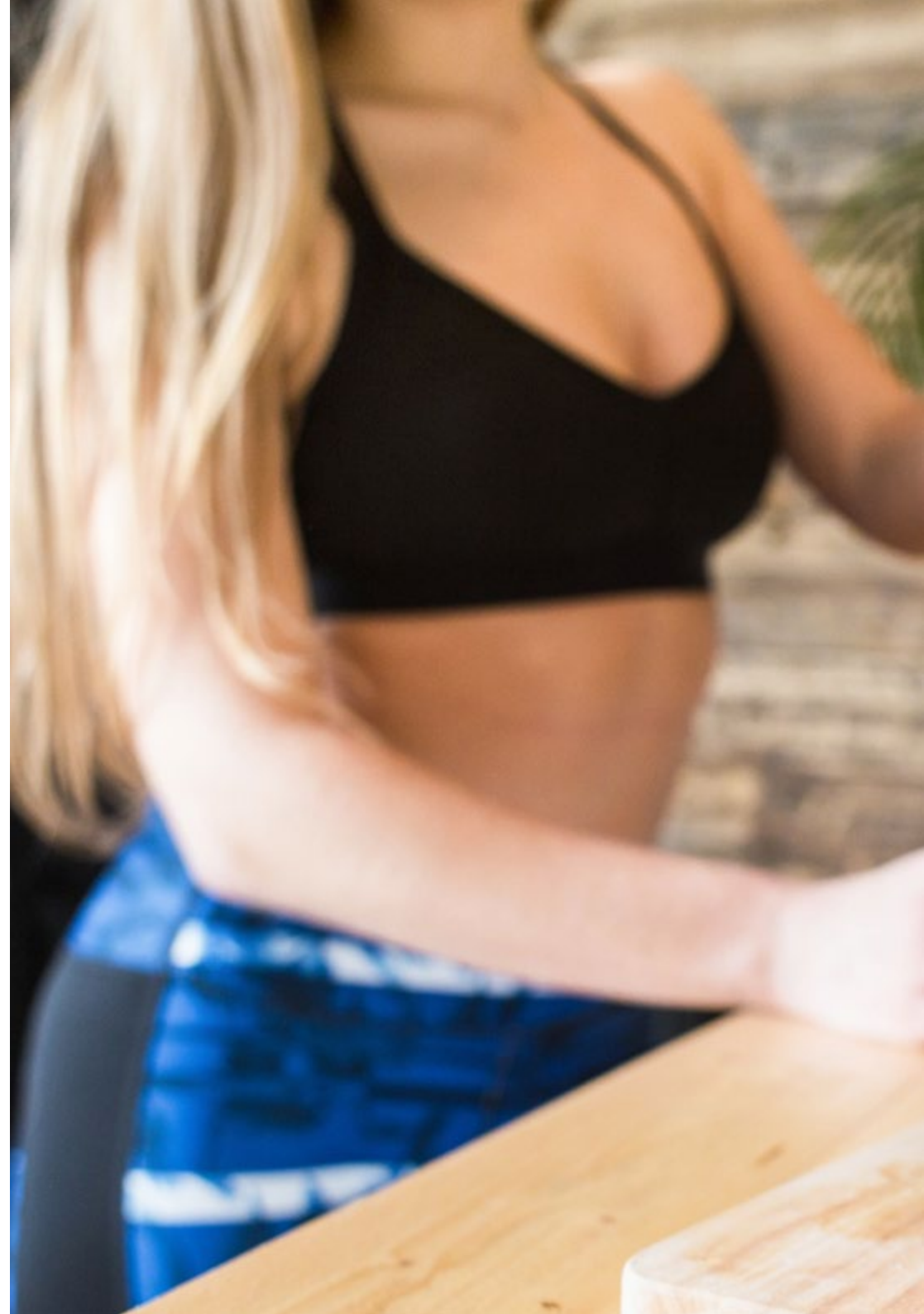


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*This Postgraduate Certificate in Exercise-Related Muscular and Metabolic Physiology contains the most complete and up-to-date scientific program on the market"*

## Module 1. Muscle and Metabolic Physiology Associated with Exercise

- 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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*A unique, key, and decisive educational experience to boost your professional development”*

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. Specialists 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 in the physician's professional 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. Students who follow this method not only achieve the assimilation of concepts, but also a development of their mental capacity, through exercises that evaluate 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.



## 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.

*Professionals will learn through real cases and by resolving 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, more than 250,000 physicians have been trained with unprecedented success in all clinical specialties regardless of surgical load. 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 specialization, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation to 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 TECH's 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 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.



#### Surgical Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current medical techniques. 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 the videos as many times as you like.



#### 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".



#### 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 Muscular and Metabolic Physiology Related to Exercise 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 your **Postgraduate Certificate in Muscular and Metabolic Physiology Related to Exercise** 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 Muscular and Metabolic Physiology Related to Exercise**

Modality: **online**

Duration: **6 weeks**

Accreditation: **6 ECTS**







**Postgraduate Certificate**  
Muscular and Metabolic  
Physiology Related to Exercise

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