

Postgraduate Certificate

Muscular and Metabolic Physiology Related to Exercise

Endorsed by the NBA





Postgraduate Certificate Muscular and Metabolic Physiology Related to Exercise

- » 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/muscular-metabolic-physiology-related-exercise

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Certificate

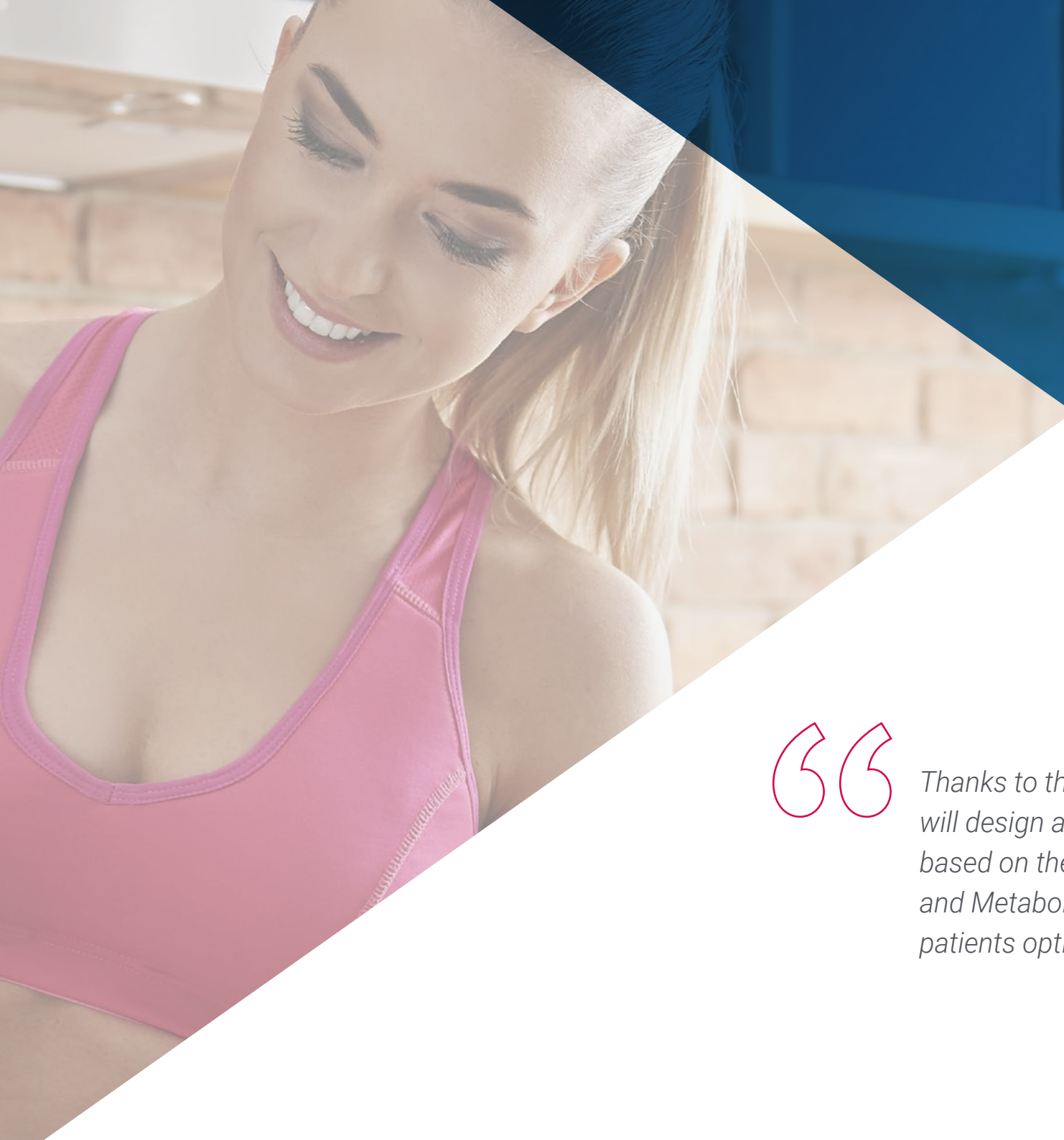
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01

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 well-being”

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. It is therefore important that physiotherapists frequently update their knowledge and skills and remain at the forefront of the latest techniques in this field.

With this in mind, TECH is launching an innovative program in Muscular and Metabolic Physiology Related to Exercise for Physiotherapists. Its objective is to analyze the physiological mechanisms that regulate muscle function during exercise and their relevance to the clinical practice of Physiotherapy. The academic itinerary will delve into cardiovascular, ventilatory and hormonal adaptations related to sports practice. In line with this, the syllabus will delve into muscle structure, 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 teaching content on the market.

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 include:

- ♦ The development of case studies presented by experts in Sports Nutrition in Special 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”

“

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 exercise-related physiological data?
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, physiotherapists 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 skills 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 training.



“

You will acquire skills 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 the ability 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 training and learning in the field of Nutrition in sport, both through the contacts established with professors and professionals of the Postgraduate Certificate, as well as in an autonomous way
- ♦ 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



This refresher program will generate a greater sense of confidence 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 Special Populations. This distinguished faculty is made up of professionals with a vast background in Muscular and Metabolic Physiology Related to Exercise for Physiotherapists. Thanks to their solid experience in this field, they have created high-level teaching 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.





*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

“

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. Albacete Balompie SAD Club
- ♦ 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 Spanish Academy of Nutrition and Dietetics (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 qualification, physiotherapists will acquire detailed knowledge of the structure and function of muscles, as well as their adaptation to physical exercise. The syllabus will go in depth into the 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 Combined 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. Muscle and Metabolic Physiology Related to 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

“*TECH has the most complete and up-to-date scientific program on the market in the field of Muscular and Metabolic Physiology. What are you waiting for to enroll?*”

05

Study Methodology

TECH is the world's first university to combine the **case study** methodology with **Relearning**, a 100% online learning system based on guided repetition.

This disruptive pedagogical strategy has been conceived to offer professionals the opportunity to update their knowledge and develop their skills in an intensive and rigorous way. A learning model that places students at the center of the educational process giving them the leading role, adapting to their needs and leaving aside more conventional methodologies.



“

TECH will prepare you to face new challenges in uncertain environments and achieve success in your career”

The student: the priority of all TECH programs

In TECH's study methodology, the student is the main protagonist.

The teaching tools of each program have been selected taking into account the demands of time, availability and academic rigor that, today, not only students demand but also the most competitive positions in the market.

With TECH's asynchronous educational model, it is students who choose the time they dedicate to study, how they decide to establish their routines, and all this from the comfort of the electronic device of their choice. The student will not have to participate in live classes, which in many cases they will not be able to attend. The learning activities will be done when it is convenient for them. They can always decide when and from where they want to study.

“

*At TECH you will NOT have live classes
(which you might not be able to attend)”*



The most comprehensive study plans at the international level

TECH is distinguished by offering the most complete academic itineraries on the university scene. This comprehensiveness is achieved through the creation of syllabi that not only cover the essential knowledge, but also the most recent innovations in each area.

By being constantly up to date, these programs allow students to keep up with market changes and acquire the skills most valued by employers. In this way, those who complete their studies at TECH receive a comprehensive education that provides them with a notable competitive advantage to further their careers.

And what's more, they will be able to do so from any device, pc, tablet or smartphone.

“*TECH's model is asynchronous, so it allows you to study with your pc, tablet or your smartphone wherever you want, whenever you want and for as long as you want*”

Case Studies and Case Method

The case method has been the learning system most used by the world's best business schools. Developed in 1912 so that law students would not only learn the law based on theoretical content, its function was also to present them with real complex situations. In this way, they could make informed decisions and value judgments about how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

With this teaching model, it is students themselves who build their professional competence through strategies such as Learning by Doing or Design Thinking, used by other renowned institutions such as Yale or Stanford.

This action-oriented method will be applied throughout the entire academic itinerary that the student undertakes with TECH. Students will be confronted with multiple real-life situations and will have to integrate knowledge, research, discuss and defend their ideas and decisions. All this with the premise of answering the question of how they would act when facing specific events of complexity in their daily work.



Relearning Methodology

At TECH, case studies are enhanced with the best 100% online teaching method: Relearning.

This method breaks with traditional teaching techniques to put the student at the center of the equation, providing the best content in different formats. In this way, it manages to review and reiterate the key concepts of each subject and learn to apply them in a real context.

In the same line, and according to multiple scientific researches, reiteration is the best way to learn. For this reason, TECH offers between 8 and 16 repetitions of each key concept within the same lesson, presented in a different way, with the objective of ensuring that the knowledge is completely consolidated during the study process.

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.



A 100% online Virtual Campus with the best teaching resources

In order to apply its methodology effectively, TECH focuses on providing graduates with teaching materials in different formats: texts, interactive videos, illustrations and knowledge maps, among others. All of them are designed by qualified teachers who focus their work on combining real cases with the resolution of complex situations through simulation, the study of contexts applied to each professional career and learning based on repetition, through audios, presentations, animations, images, etc.

The latest scientific evidence in the field of Neuroscience points to the importance of taking into account the place and context where the content is accessed before starting a new learning process. Being able to adjust these variables in a personalized way helps people to remember and store knowledge in the hippocampus to retain it in the long term. This is a model called Neurocognitive context-dependent e-learning that is consciously applied in this university qualification.

In order to facilitate tutor-student contact as much as possible, you will have a wide range of communication possibilities, both in real time and delayed (internal messaging, telephone answering service, email contact with the technical secretary, chat and videoconferences).

Likewise, this very complete Virtual Campus will allow TECH students to organize their study schedules according to their personal availability or work obligations. In this way, they will have global control of the academic content and teaching tools, based on their fast-paced professional update.



The online study mode of this program will allow you to organize your time and learning pace, adapting it to your schedule”

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 assess 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.

The university methodology top-rated by its students

The results of this innovative teaching model can be seen in the overall satisfaction levels of TECH graduates.

The students' assessment of the quality of teaching, quality of materials, course structure and objectives is excellent. Not surprisingly, the institution became the best rated university by its students on the Trustpilot review platform, obtaining a 4.9 out of 5.

Access the study contents from any device with an Internet connection (computer, tablet, smartphone) thanks to the fact that TECH is at the forefront of technology and teaching.

You will be able to learn with the advantages that come with having access to simulated learning environments and the learning by observation approach, that is, Learning from an expert.



As such, the best educational materials, thoroughly prepared, will be available in this program:



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.

This content is then adapted in an audiovisual format that will create our way of working online, with the latest techniques that allow us to offer you high quality in all of the material that we provide you with.



Practicing Skills and Abilities

You will carry out activities to develop specific competencies and skills in each thematic field. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop within the framework of the globalization we live in.



Interactive Summaries

We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

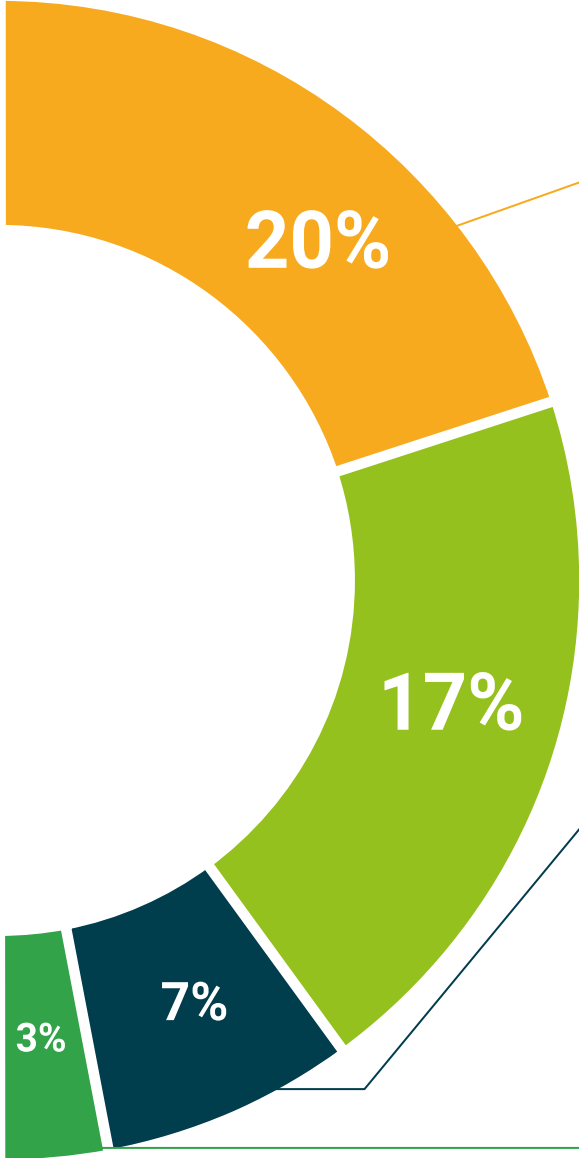
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



Additional Reading

Recent articles, consensus documents, international guides... In our virtual library you will have access to everything you need to complete your education.





Case Studies

Students will complete a selection of the best case studies in the field. Cases that are presented, analyzed, and supervised by the best specialists in the world.



Testing & Retesting

We periodically assess and re-assess your knowledge throughout the program. We do this on 3 of the 4 levels of Miller's Pyramid.



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 for 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.



“

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

This private qualification will allow you to obtain a **Postgraduate Certificate in Muscular and Metabolic 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.

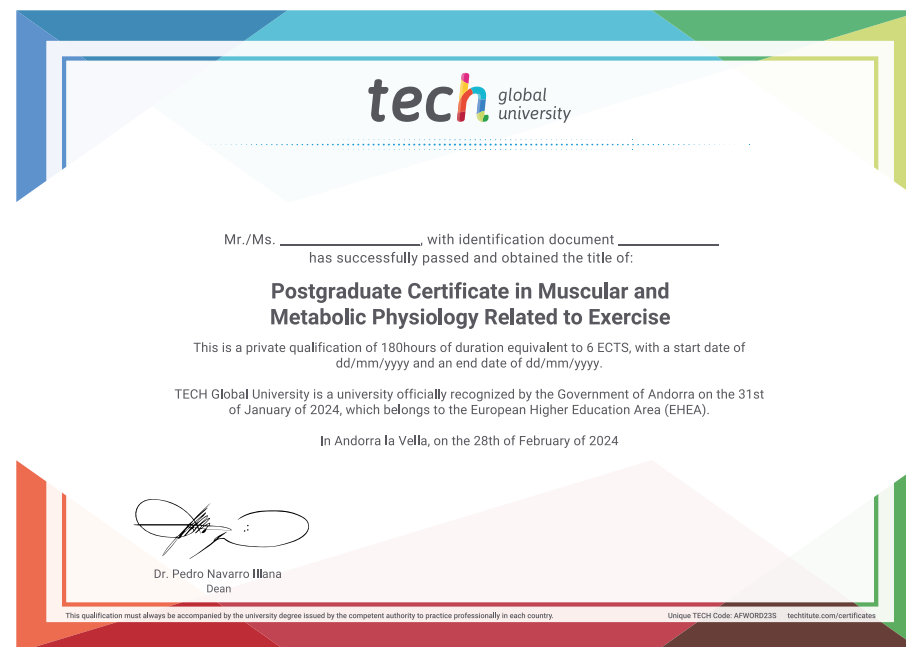
This **TECH Global University** private qualification, is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Muscular and Metabolic Physiology Related to Exercise**

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.

future
health confidence people
education information tutors
guarantee accreditation teaching
institutions technology learning
community commitment
personalized service innovation
knowledge present
development languages
virtual classroom



Postgraduate Certificate
Muscular and Metabolic
Physiology Related
to Exercise

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

Muscular and Metabolic Physiology Related to Exercise

Endorsed by the NBA

