

# Postgraduate Diploma

## Muscular and Metabolic Physiology for Nursing





## Postgraduate Diploma Muscular and Metabolic Physiology for Nursing

- » Modality: online
- » Duration: 6 months
- » Certificate: TECH Global University
- » Accreditation: 18 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techitute.com/us/nursing/postgraduate-diploma/postgraduate-diploma-muscular-metabolic-physiology-nursing](http://www.techitute.com/us/nursing/postgraduate-diploma/postgraduate-diploma-muscular-metabolic-physiology-nursing)

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# 01

# Introduction

An understanding of muscle and metabolic physiology is essential for nursing professionals in their routine clinical practice. With the growing interest in promoting active and healthy lifestyles, it is essential that these specialists have a holistic view of how the human body responds to physical exercise and nutrition. This will enable experts to take a holistic approach to patients with musculoskeletal diseases, as well as to plan dietary programs that optimize the overall health of individuals. In response to this, TECH presents a complete and innovative university program focused on Muscular and Metabolic Physiology related to sports activity. In addition, the program is delivered in a flexible 100% online mode.



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*With this Postgraduate Diploma, based on Relearning, you will design comprehensive care plans, based on the understanding of the specific needs of patients according to their muscular physiology and metabolism”*

Parathletes experience unique metabolic adaptations due to their disabilities and the physical exertion required by sports practice. These modifications can have a significant impact on nutrient metabolism, energy use and exercise response. Given this situation, the International Paralympic Committee stresses the importance of these athletes receiving comprehensive clinical care to ensure that they enjoy adequate nutrition that serves both to improve their quality of life and sporting performance. In this sense, nurses play an important role in this area by providing advice and planning personalized nutritional plans for these individuals.

Within this framework, TECH implements a revolutionary Postgraduate Diploma in Muscular and Metabolic Physiology for Nursing. Its objective is to provide specialists with an understanding of the mechanisms underlying metabolic or muscular pathologies in order to develop individualized care strategies. The academic pathway will examine cardiovascular, hormonal and ventilatory adaptations related to exercise so that graduates can prevent exercise-related complications (such as exacerbation of respiratory diseases). Likewise, the teaching materials will delve into aspects such as the lactic threshold, protein metabolism or the mixed bioenergetics of muscle fibers. In line with this, the program will address the specific energy demands of para-sportsmen, addressing conditions such as spinal cord injuries, cerebral palsy or impaired vision. In addition, a prestigious International Guest Director will give intensive master classes to help graduates apply the principles of Muscular and Metabolic Physiology in the execution of nursing care.

Regarding the methodology of this university program, it is taught 100% online. In this sense, the only thing that nurses will need will be a device with Internet access to enter the Virtual Campus and enjoy the most complete materials. In addition, TECH uses its Relearning system, which guarantees progressive and natural learning for graduates.

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

- ♦ The development of practical cases presented by experts in Nutrition and Dietetics
- ♦ 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 self-assessment can be used 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 distinguished International Guest Director will offer several Masterclasses to delve into the workings of the human body in terms of movement, metabolism and response to exercise”*

“*You will delve into Nutritional Planning for para-athletes and ensure they have the nutrients they need to optimize their athletic performance. their athletic performance”*

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.

*You will implement into your daily practice the most cutting-edge therapeutic interventions to promote the muscular and metabolic health of your patients, as well as to address related pathological conditions.*

*You will accomplish your academic goals from the comfort of your home thanks to TECH's 100% online methodology.*



# 02 Objectives

Through this program, nurses will have specialized knowledge about the Physiology of the muscular and metabolic system. In this way, graduates will gain skills to perform physical evaluations and diagnoses related to the main disorders that affect these devices. Thanks to this, specialists will provide specific care to sports patients and develop strategies to prevent complications associated with physical activity (such as Orthostatic Hypotension, respiratory or cardiovascular conditions). Also, the experts will be highly qualified to educate users about the importance of exercise and nutrition to minimize the risk of chronic pathologies.







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*You will acquire skills to apply the fundamentals of Muscular and Metabolic Physiology efficiently in your clinical care, ensuring optimal management of your patients”*



## General Objectives

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- ♦ Manage 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
- ♦ Develop the ability to work in a multidisciplinary environment



*You will be able to access the didactic contents at any time of the day and from any electronic device with an Internet connection. Even from your cell phone!"*





## Specific Objectives

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

- ◆ Knowing 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

### Module 2. Athlete Assessment at Different Times of the Season

- ◆ Perform biochemical interpretation to detect nutritional deficits or overtraining states
- ◆ Perform the interpretation of the different methods of body composition, to optimize the weight and fat percentage appropriate to the sport practiced
- ◆ Perform the monitoring of the athlete throughout the season
- ◆ Plan the periods of the season according to their requirements

### Module 3. Nutrition in Parathletes

- ◆ Delve into the differences between the various categories of parathletes and their physiological-metabolic limitations
- ◆ Determine the nutritional requirements of the different para-sportsmen in order to establish a specific nutritional plan
- ◆ Delve into the knowledge necessary to establish interactions between the intake of drugs in these athletes and nutrients, to avoid nutrient deficits
- ◆ Understand the body composition of para-athletes in different sport categories

# 03

# Course Management

TECH focuses on providing the most complete and up-to-date university programs. To achieve this, it carries out a rigorous process to compose its faculty. As a result, this program brings together an outstanding group of professionals specialized in Nutrition and Dietetics. These specialists have extensive work experience, in which they have optimized both the sports performance and the general wellbeing of multiple athletes. In this way, these experts have created teaching materials that stand out for their excellent quality and applicability to the demands of the labor market. Undoubtedly, this is an academic option that will raise the employment horizons of graduates.



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*The teaching staff of this program has extensive experience in both research and application in the field of Muscular and Metabolic Physiology”*

## 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

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- 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 by the Louisiana State University
- Graduate in Dietetics from Louisiana State University
- Member of: Louisiana Dietetic Association, Association of Dietitians, Collegiate and Professional Sports, 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. Martínez Noguera, Francisco Javier

- ◆ Sports nutritionist at CIARD-UCAM
- ◆ Sports nutritionist at Jorge Lledó Physiotherapy Clinic
- ◆ Research assistant at CIARD-UCAM
- ◆ Sports nutritionist at UCAM Murcia Football Club
- ◆ Nutritionist at SANO Center
- ◆ Sports nutritionist at UCAM Murcia Basketball Club
- ◆ PhD in Sports Science from the Catholic University San Antonio de Murcia
- ◆ Graduate in Human Nutrition and Dietetics from the Catholic University San Antonio of Murcia
- ◆ Master's Degree in Nutrition and Food Safety from the Catholic University San Antonio of Murcia

### 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, nurses will have a comprehensive view of the structure and function of muscle tissue, as well as the body's metabolic processes. The program will delve into cardiovascular, ventilatory and hormonal adaptations related to exercise, which will enable graduates to plan specific care for sports users. In this sense, the academic content will examine aspects ranging from biochemical assessment or body composition to monitoring. Also, the syllabus will emphasize energy requirements and hydration in para-sportsmen. Therefore, specialists will be qualified to apply techniques that promote the muscular and metabolic health of their patients.





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*You will be able to implement therapeutic interventions aimed at promoting muscle and metabolic health, as well as to manage related pathological conditions”*

## 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

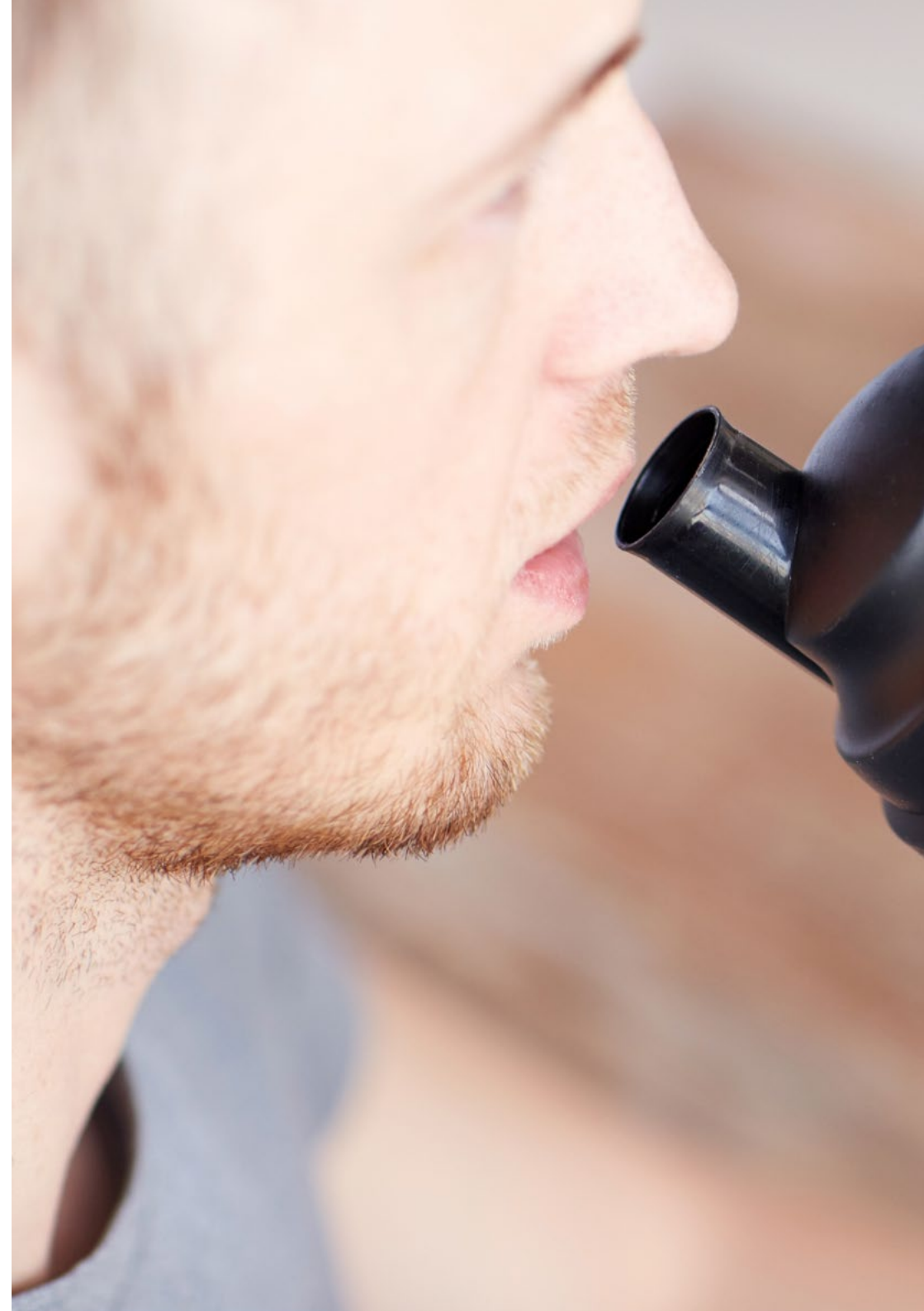


**Module 2.** Evaluation of the Athlete at Different Times of the Season

- 2.1. Biochemical Evaluation
  - 2.1.1. Blood Count:
  - 2.1.2. Overtraining Markers
- 2.2. Anthropometric Evaluation
  - 2.2.1. Body Composition
  - 2.2.2. ISAK Profile
- 2.3. Preseason
  - 2.3.1. High Workload
  - 2.3.2. Assuring Caloric and Protein Intake
- 2.4. Competitive Season
  - 2.4.1. Sports Performance
  - 2.4.2. Recovery between Games
- 2.5. Transition Period
  - 2.5.1. Vacation Period
  - 2.5.2. Changes in Body Composition
  - 2.5.3. Travel
- 2.6. Tournaments during the Season
  - 2.6.1. Off-season Tournaments (World Cups, European Cups and The Olympic Games)
- 2.7. Athlete Monitoring
  - 2.7.1. Basal Athlete Status
  - 2.7.2. Evolution during the Season
- 2.8. Sweat Rate Calculation
  - 2.8.1. Hydric Losses
  - 2.8.2. Calculation Protocol
- 2.9. Multidisciplinary Work
  - 2.9.1. The Role of the Nutritionist in the Athlete's Environment
  - 2.9.2. Communication with the Rest of the Areas
- 2.10. Doping
  - 2.10.1. WADA List
  - 2.10.2. Anti-doping Tests

### Module 3. Parathletes

- 3.1. Classification and Categories in Parathletes
  - 3.1.1. What is a Parathlete?
  - 3.1.2. How are Parathletes Classified?
- 3.2. Sports Science in Parathletes
  - 3.2.1. Metabolism and Physiology
  - 3.2.2. Biomechanics
  - 3.2.3. Psychology
- 3.3. Energy Requirements and Hydration in Parathletes
  - 3.3.1. Optimal Energy Demands for Training
  - 3.3.2. Hydration Planning before, during and after Training and Competitions
- 3.4. Nutritional Problems in the Different Categories of Para Athletes According to Pathology or Anomaly
  - 3.4.1. Spinal Cord Injuries
  - 3.4.2. Cerebral Palsy and Acquired Brain Injuries
  - 3.4.3. Amputees
  - 3.4.4. Vision and Hearing Impairment
  - 3.4.5. Intellectual Impairments
- 3.5. Nutritional Planning in Para-Sport Athletes with Spinal Cord Injury and Cerebral Palsy and Acquired Brain Injury
  - 3.5.1. Nutritional Requirements (Macro- and Micronutrients) Sweating and Fluid Replacement during Exercise
- 3.6. Nutritional Planning in Para athletes with Amputations
  - 3.6.1. Energy Requirements
  - 3.6.2. Macronutrients
  - 3.6.3. Thermoregulation and Hydration
  - 3.6.4. Nutritional Issues Related to Prosthetics
- 3.7. Planning and Nutritional Problems in Para Athletes with Vision Hearing Impairment and Intellectual Impairment
  - 3.7.1. Sports Nutrition Problems with Visual Impairment: Retinitis Pigmentosa, Diabetic Retinopathy, Albinism, Stargardt's Disease and Hearing Pathologies.
  - 3.7.2. Sports Nutrition Problems in Para-Athletes with Intellectual Deficiencies: Down Syndrome, Autism and Asperger's and Phenylketonuria



- 3.8. Body Composition in Parathletes
  - 3.8.1. Measurement Techniques
  - 3.8.2. Factors Influencing the Reliability of Different Measurement Methods
- 3.9. Pharmacology and Nutrient Interactions
  - 3.9.1. Different Types of Drugs Taken by Parathletes
  - 3.9.2. Micronutrient Deficiencies in Parathletes
- 3.10. Ergogenic Aids
  - 3.10.1. Potentially Beneficial Supplements for Parathletes
  - 3.10.2. Adverse Effects on Health and Contamination and Doping Problems Due to the Intake of Ergogenic Aids

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*This university program prepares you to meet the challenges of clinical care in Muscle and Metabolic Physiology. Enroll now and experience immediate progress in your nursing career!”*



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.





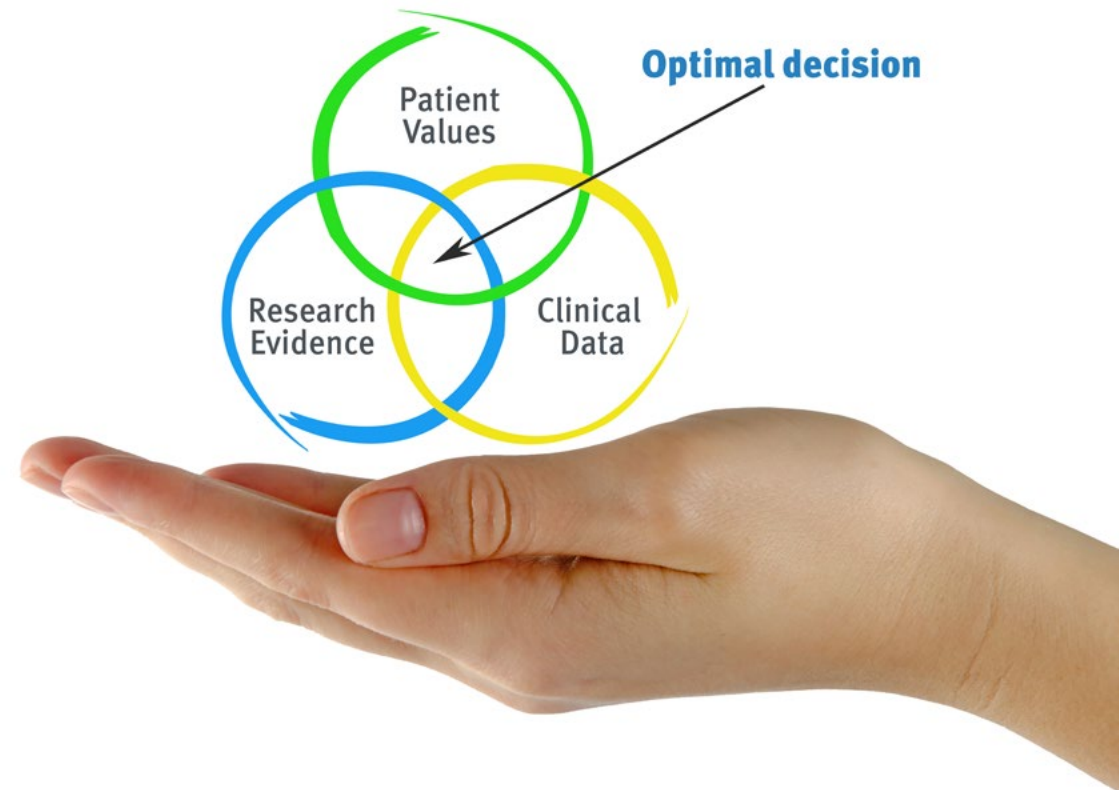
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## At TECH Nursing School we use the Case Method

In a given situation, what should a professional do? 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. Nurses learn better, faster, and more sustainably over time.

*With TECH, nurses can experience a learning methodology 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, in an attempt to recreate the real conditions in professional nursing 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. Nurses 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 nursing professional to better integrate knowledge acquisition into the hospital setting or primary care.
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 case studies with a 100% online learning system based on repetition combining a minimum of 8 different elements in each lesson, which is a real revolution compared to the simple study and analysis of cases.



*The nurse 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 have trained more than 175,000 nurses with unprecedented success in all specialities regardless of practical 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 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 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.



### Nursing Techniques and Procedures on Video

We introduce you to the latest techniques, to the latest educational advances, 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 them as many times as you want.



### Interactive Summaries

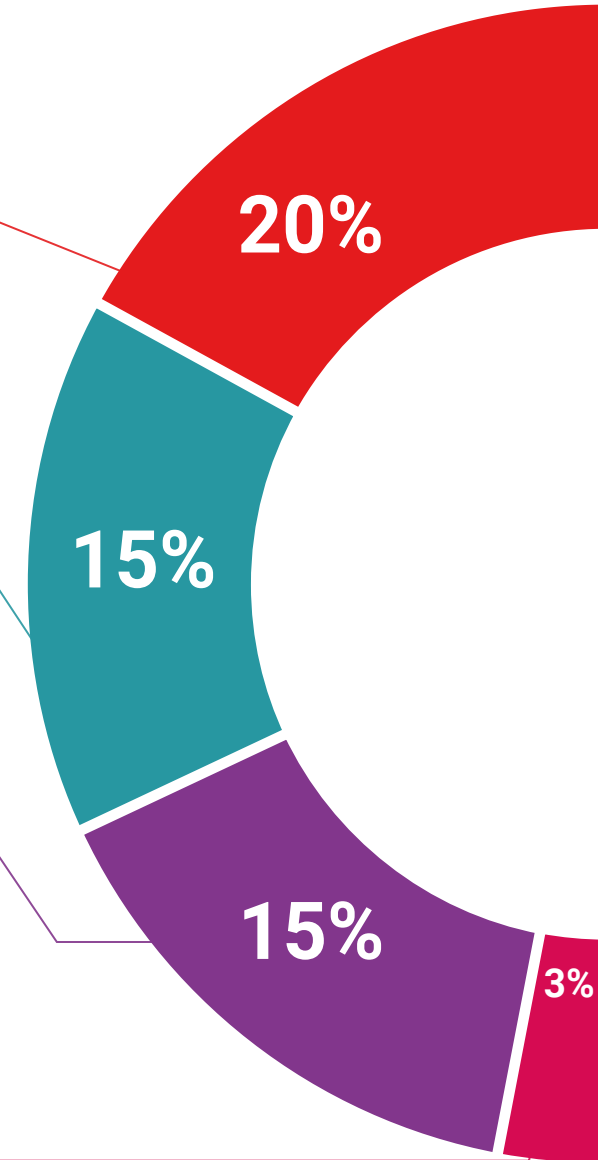
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

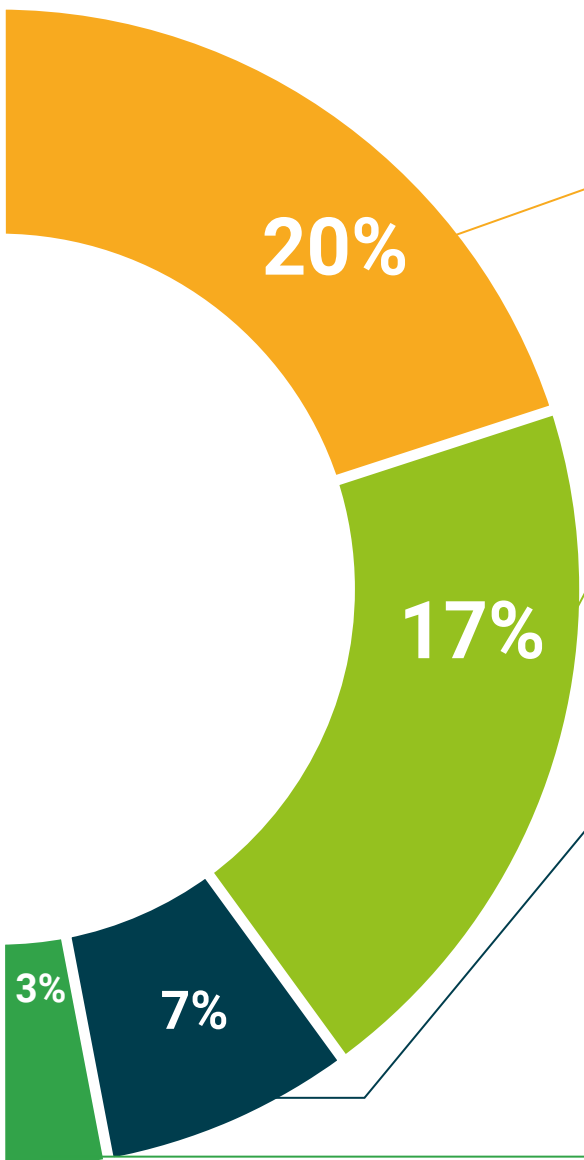
This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



### 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 suggesting that observing third-party experts can be useful.

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 Diploma in Muscular and Metabolic Physiology for Nursing guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma 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 private qualification will allow you to obtain a **Postgraduate Diploma in Muscular and Metabolic Physiology for Nursing** 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.

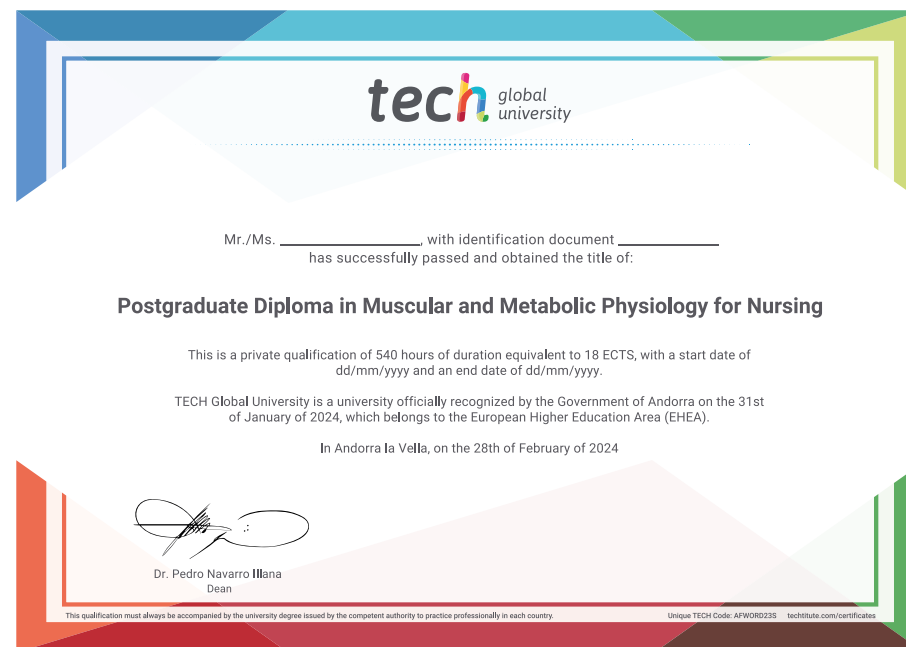
This **TECH Global University** private qualification is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Diploma in Muscular and Metabolic Physiology for Nursing**

Modality: **online**

Duration: **6 months**

Accreditation: **18 ECTS**



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



**Postgraduate Diploma**  
Muscular and Metabolic  
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