

Postgraduate Diploma

Muscular and Metabolic Physiology for Nutritionists





Postgraduate Diploma Muscular and Metabolic Physiology for Nutritionists

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

Website: www.techtute.com/us/nutrition/postgraduate-diploma/postgraduate-diploma-muscular-metabolic-physiology-nutritionists

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01

Introduction

The physiology of muscle, as well as the biochemistry that regulates the entire metabolic process resulting from physical activity, is the basis of any Sports Nutritionist. This intensive training explains the relationship of the muscle with the rest of the systems involved in physical activity, as well as the relevance of the different macronutrients in the physiological performance of the muscular system.

This program will approach biochemistry and exercise metabolism from a scientific and practical point of view, partially renouncing the complexity of the subject. Likewise, the student will learn how to monitor the athlete and para-athlete throughout the season, in which it is considered vital to know the basal values to know what their starting point is, and thus plan the different phases of the season to enhance their performance.





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

During sports practice, different problems arise that have their origin or solution in nutrition and/or sports supplementation. Athletes with special situations can often be neglected due to the lack of knowledge of the professional who attends them, so this Postgraduate Diploma trains students to be able to act as reference professionals in Sports Nutrition focused on athletes in special situations.

This Postgraduate Diploma 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 program we can find a teaching staff of the highest level, made up of 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. The teachers of this Postgraduate Diploma are professionals who seek excellence in their teaching and work, teaching in university centers and working with athletes to maximize their performance.

The Postgraduate Diploma has multimedia content that helps to acquire the knowledge taught, developed with the latest educational technology. At the same time, it will allow the student a contextual and situated learning, within a simulated environment that provides training focused on solving real problems.

As it is an online Postgraduate Diploma, the student is not conditioned by fixed schedules or the need to move to another physical location, but can access the contents at any time of the day, balancing their work or personal life with their academic life.

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

- The graphic, schematic, and eminently practical contents with which they are created contain information that is indispensable for professional practice.
- It contains exercises where the self-assessment process can be carried out to improve learning.
- Algorithm-based interactive learning system for decision-making for patients with feeding problems.
- 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 Diploma may be the best investment you can make in the selection of a refresher program for two reasons: in addition to updating your knowledge in Muscular and Metabolic Physiology for Nutritionists, you will obtain a Postgraduate Diploma qualification from TECH Global University"

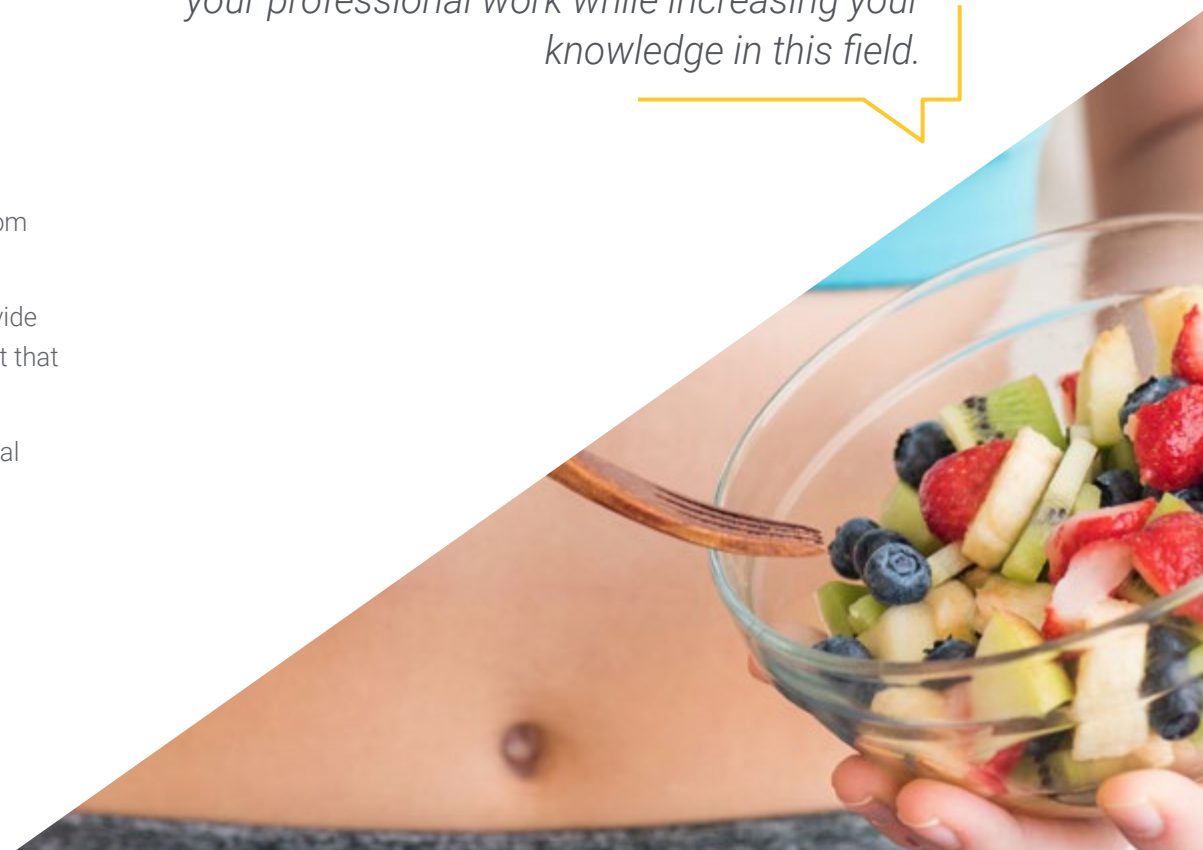
Its teaching staff includes professionals belonging to the field of nutrition, who contribute their work experience to this training, as well as renowned specialists from reference societies and prestigious universities.

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 training programmed to train 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 academic year. The professional will be assisted by an innovative interactive video system created by renowned and experienced experts in sports nutrition.

The Postgraduate Diploma allows training in simulated environments, which provide immersive learning programmed to train for real situations.

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



02 Objectives

The main objective of the program is the development of theoretical and practical learning, so that the nutrition professional can master in a practical and rigorous way the study of Sports Nutrition in Special Populations.



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This refresher program will provide you with a sense of confidence in your daily work, which will help you grow both personally and professionally”



General Objectives

- ♦ 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 different disciplines to achieve maximum sports performance.
- ♦ Manage advanced knowledge on nutritional planning in professional athletes of team disciplines to achieve maximum 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 to one's own professional field.
- ♦ Ability to work in a multidisciplinary environment.
- ♦ Advanced understanding of the context in which the area of their specialty is developed.
- ♦ Manage advanced skills to detect possible signs of nutritional alteration associated with sports practice.
- ♦ 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 teachers and professionals of this training, as well as in an autonomous way.
- ♦ Specialize in the structure of muscle tissue and its implication in sport.
- ♦ Know the energy and nutritional needs of athletes in different pathophysiological situations.
- ♦ Specialize in the energy and nutritional needs of athletes in different age and gender specific situations.
- ♦ Specialize in dietary strategies for the prevention and treatment of the injured athlete.
- ♦ Specialize in the energy and nutritional needs of children athletes.
- ♦ Specialize in the energy and nutritional needs of Paralympic athletes.



Specific Objectives

- ♦ Gain a deep knowledge of the structure of skeletal muscle.
- ♦ Understand in depth the functioning of skeletal muscle.
- ♦ Delve into the most important adaptations that occur in athletes.
- ♦ Delve into the mechanisms of energy production based on the type of exercise performed.
- ♦ Delve into the integration of the different energy systems that make up the energy metabolism of muscle.
- ♦ Biochemical interpretation to detect nutritional deficits or overtraining states.
- ♦ Interpretation of the different methods of body composition, to optimize the weight and fat percentage appropriate to the sport practiced.
- ♦ Monitoring of the athlete throughout the season.
- ♦ Planning of seasonal schedules according to individual requirements.
- ♦ Delve into the differences between the different categories of para-sportsmen 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 deficits.
- ♦ Understand the body composition of paraathletes in their different sport categories.
- ♦ Apply current scientific evidence on nutritional ergogenic aids.

03

Course Management

Our teachers, made up of experts in Sports Nutrition, are well known in the profession and are professionals with years of teaching experience who have come together to help you boost your career. To this end, they have developed this Postgraduate Diploma with recent updates in the field that will allow you to train and increase your skills in this sector.





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

Management



Dr. Marhuenda Hernández, Javier

- ♦ Full Member of the Spanish Academy of Human Nutrition and Dietetics. Professor and researcher at UCAM.
- ♦ Ph.D. in Nutrition.
- ♦ Master's Degree in Clinical Nutrition.
- ♦ Graduate in Nutrition.

Professors

- ♦ Graduate in Human Nutrition and Dietetics
- ♦ Master's Degree in Nutrition in Physical Activity and Sport.
- ♦ Anthropometrist ISAK level 1.
- ♦ Currently a Doctoral student in the Department of Pharmacy of the UCAM, researching Nutrition and Oxidative Stress, in addition to his work as a Nutritionist in the Youth Team of C.D. Castellón.
- ♦ Experience in different soccer teams in the Valencian community, as well as extensive experience in consultation in face-to-face clinic.

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Nutritional Formula

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Structure and Content

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





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This Postgraduate Diploma in Muscular and Metabolic Physiology for Nutritionists 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. Functions of Lipids.
 - 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. The Evaluation of the Athlete at Different Moments 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
- 2.6. Travel
 - 2.6.1. Tournaments during the Season
 - 2.6.2. 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. Para-Athletes

- 3.1. Classification and Categories in Para-Athletes
 - 3.1.1. What is a Para Athlete?
 - 3.1.2. How are Para Athletes Classified?
- 3.2. Sports Science in Para Athletes
 - 3.2.1. Metabolism and Physiology
 - 3.2.2. 2.2. Biomechanics
 - 3.2.3. 2.3. Psychology
- 3.3. Energy Requirements and Hydration in Para-Athletes
 - 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 Athletes with Spinal Cord Injury and Cerebral Palsy and Acquired Brain Injuries
 - 3.5.1. Nutritional Requirements (Macro and Micronutrients)
 - 3.5.2. Sweating and Fluid Replacement during Exercise
- 3.6. Nutritional Planning in Amputee Para Athletes
 - 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 Para Athletes
 - 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 Para Athletes
 - 3.9.2. Micronutrient Deficiencies in Para Athletes
- 3.10. Ergogenic Aids
 - 3.10.1. Potentially Beneficial Supplements for Para Athletes
 - 3.10.2. Adverse Effects on Health and Contamination and Doping Problems Due to the Intake of Ergogenic Aids



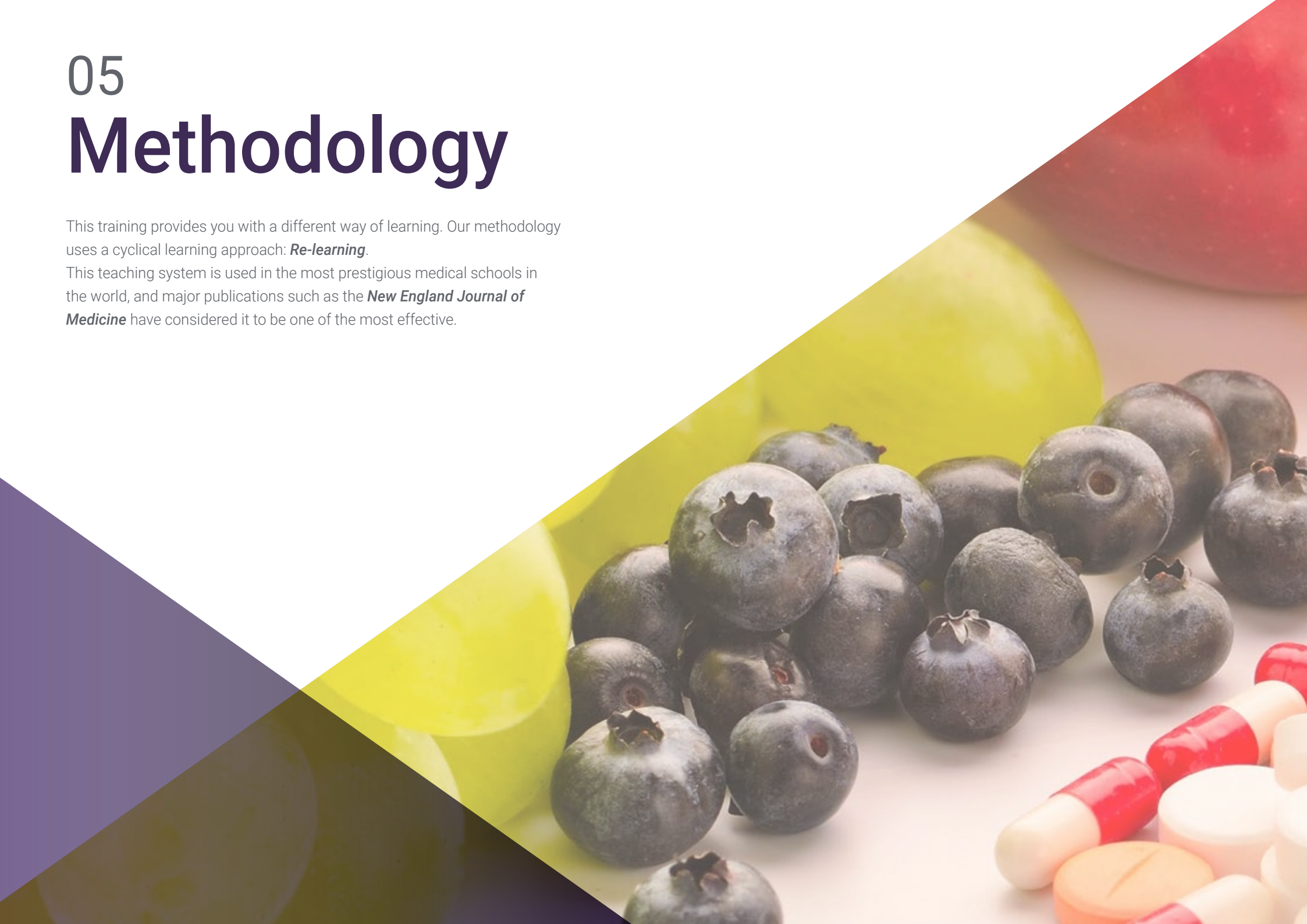
A unique, key and decisive training experience to boost your professional development”

05

Methodology

This training provides you with a different way of learning. Our methodology uses a cyclical learning approach: ***Re-learning***.

This teaching system is used 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 Re-learning, 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

In a given clinical situation, what would you do? Throughout the program you will be presented with multiple simulated clinical cases based on real patients, where you will have to investigate, establish hypotheses and, finally, resolve the situation. There is abundant scientific evidence on the effectiveness of the method. Nutritionists learn better, faster, and more sustainably over time.

With TECH, nutritionists can 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 potential 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 nutritional 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. Nutritionists 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 is solidly focused on practical skills that allow the nutritionist to better integrate the knowledge into clinical practice.
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.



Re-Learning Methodology

At TECH we enhance the Harvard case method with the best 100% online teaching methodology available: Re-learning.

Our 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, which represent a real revolution with respect to simply studying and analyzing cases.



The nutritionist 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 Re-learning method has managed to improve the overall satisfaction levels of professionals who complete their studies, with respect to the quality indicators of the best Spanish-speaking online university (Columbia University).

With this methodology we have trained more than 45,000 nutritionists with unprecedented success, in all clinical specialties regardless of the workload. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

Re-learning 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 to success.

In our program, learning is not a linear process, but rather a spiral (we 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.



In this program you will have access to the best educational material, prepared with you 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.

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.



Nutrition Techniques and Procedures on Video

We introduce you to the latest techniques, the latest educational advances, and the forefront of current nutritional procedures and techniques. All this, in first person, with the maximum rigor, explained and detailed for your assimilation and understanding. And best of all, you can watch them as many times as you want.



Interactive Summaries

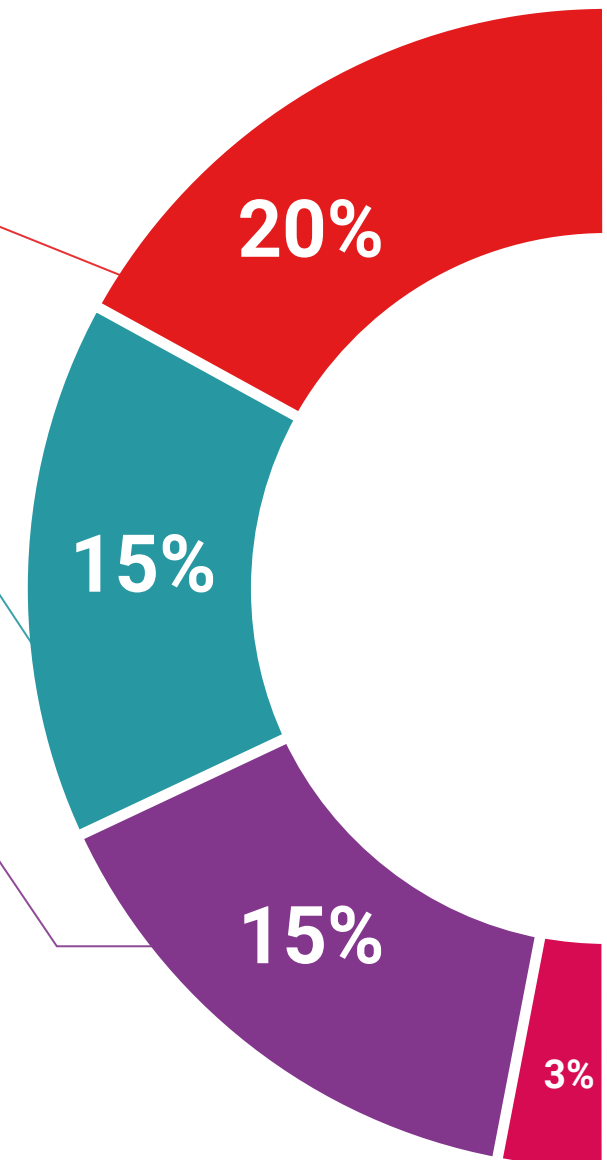
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

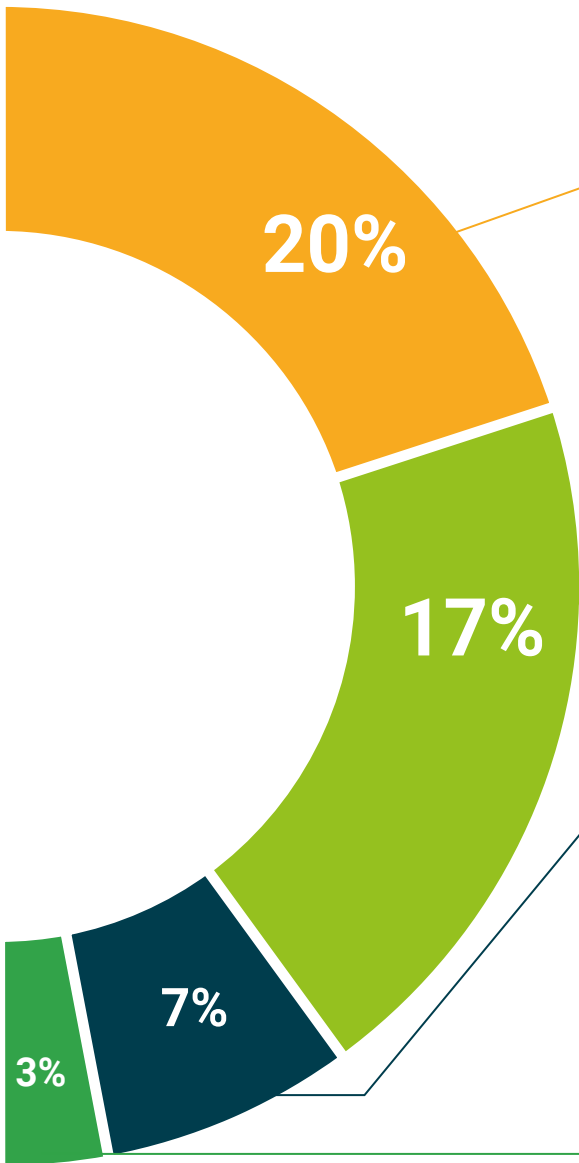
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



Additional Reading

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





Expert-Led Case Studies and Case Analysis

Effective learning ought to be contextual. Therefore, we will present you with real case developments in which the expert will guide you through focusing on and solving the different situations: a clear and direct way to achieve the highest degree of understanding.



Testing & Re-testing

We periodically evaluate and re-evaluate your knowledge throughout the program, through assessment and self-assessment activities and exercises: so that you can see how you are achieving your 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 our future difficult decisions.



Quick Action Guides

We offer you the most relevant contents of the course in the form of worksheets or quick action guides. A synthetic, practical, and effective way to help you progress in your learning.



06

Certificate

Through a different and stimulating learning experience, you will be able to acquire the necessary skills to take a big step in your training. An opportunity to progress, with the support and monitoring of a modern and specialized university, which will propel you to another professional level.



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Add to your CV an Postgraduate Diploma in Muscular and Metabolic Physiology for Nutritionists and become a highly competitive professional”

This program will allow you to obtain your **Postgraduate Diploma in Muscular and Metabolic Physiology for Nutritionists** 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.

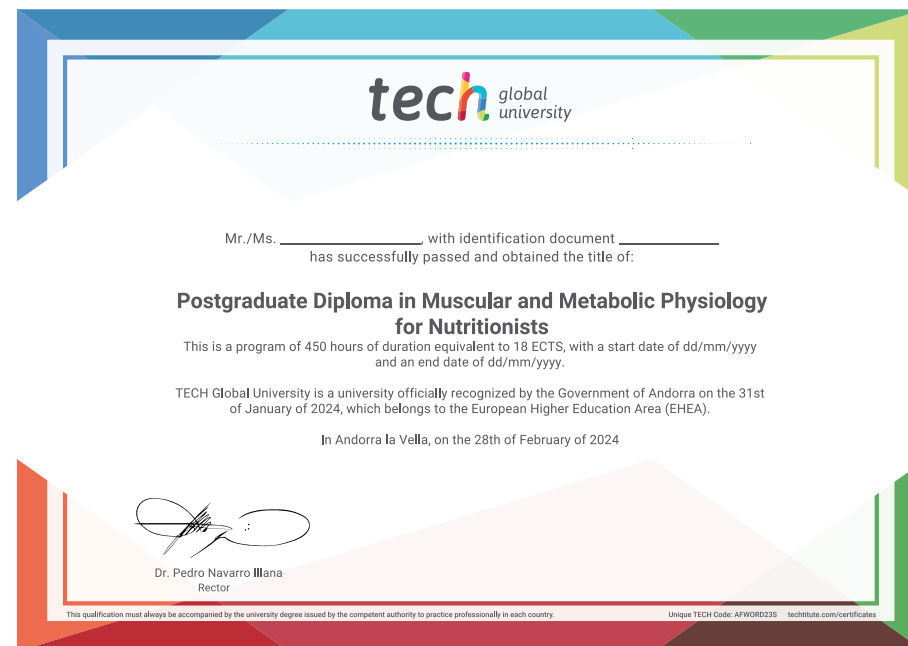
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

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

Modality: **online**

Duration: **6 months**

Accreditation: **18 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

online tra

velopment

languages

virtual classroom

tech global
university

Postgraduate Diploma
Muscular and Metabolic
Physiology for Nutritionists

- » Modality: online
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Postgraduate Diploma

Muscular and Metabolic Physiology for Nutritionists

