

# Postgraduate Certificate Exercise Physiology





## Postgraduate Certificate Exercise Physiology

- » Course Modality: Online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/us/veterinary-medicine/postgraduate-certificate/exercise-physiology](http://www.techtitute.com/us/veterinary-medicine/postgraduate-certificate/exercise-physiology)

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# 01

# Introduction

Achieving the maximum sporting performance of an athletic horse depends to a large extent on proper training planning. With proper and individualized planning, in addition to achieving the performance appropriate to the genetic potential of the horse, the risk of fatigue, exhaustion and, therefore, musculoskeletal injuries and overtraining will be reduced. By joining this community of learners, the students will be able to develop their skills in the treatment of these animals.





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Society demands veterinary professionals specialized in equines and with extensive knowledge in Exercise Physiology. Think no more and train with us”



To achieve maximum sporting performance of the horse it is important to know how to enhance the three basic capabilities of an athlete: endurance or aerobic capacity, speed or anaerobic capacity and strength. Thus, the basics of physical training and its application to the various equestrian disciplines will be presented.

Before programming a training program, it is necessary to know what level of physical fitness a particular horse is starting from. Before programming a training program, it is necessary to know what level of physical fitness a particular horse is starting from. Based on these data, a training program can be designed more precisely, a reduction in the level of physical fitness can be detected and the possible causes can be investigated before the appearance of pathologies with clinical manifestations, and the rider can be advised, helping to establish a competition strategy. In addition, the control of training intensity reduces the risk of overtraining.

A stress test is also very useful to evaluate the possible causes involved in the lack or loss of performance of a sport horse. The monitoring of the functional indices obtained from the stress test over the course of an equestrian season will allow the identification of the loss of performance towards a specific group of pathologies.

There are several pathologies that are linked to the performance of physical activity, such as heat stroke, rhabdomyolysis, exhaustion syndrome, hydroelectrolytic alterations, cardiac arrhythmias, synchronous diaphragmatic flutter, etc. It is therefore important to know how to act in the face of exhaustion syndrome, not only with regard to treatment, but also to the establishment of effective preventive measures.

This Postgraduate Certificate provides students with specialized tools and skills to successfully develop their professional activity, working on key competencies such as knowledge of the reality and daily practice of the veterinary professional, and developing responsibility in the monitoring and supervision of their work, as well as communication skills in a teamwork environment.

As it is an online program, students will not be bound by fixed schedules or the need to move to another physical location, but rather, they can access the content at any time of the day, balancing their professional or personal life with their academic life.

This **Postgraduate Certificate in Exercise Physiology** 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 equine physiotherapy and rehabilitation
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional development
- ♦ Practical exercises where self-assessment can be used to improve learning
- ♦ Special emphasis on innovative methodologies in Exercise Physiology
- ♦ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ♦ Content that is accessible from any device with an Internet connection



Don't miss the opportunity to study this Postgraduate Certificate in Exercise Physiology. It's the perfect opportunity to advance your career"

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This Postgraduate Certificate is the best investment you can make when choosing a refresher programme to expand your existing knowledge in Exercise Physiology”

Its teaching staff includes professionals from the veterinary field, who bring the experience of their work to this qualification, as well as recognized 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 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 throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts in Exercise Physiology.

This program comes with the best educational material, providing you with a contextual approach that will facilitate your learning.

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



02

# Objectives

The Postgraduate Certificate in Exercise Physiology is aimed at facilitating the performance of the veterinary professional with the latest advances and newest treatments in the sector.







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Our goal is to provide quality knowledge so that our students become the best in their profession”



## General Objectives

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- ♦ Plan and time a program according to the horse's fitness level, competitive objectives and the type of equestrian discipline
- ♦ Design a stress test according to the equestrian discipline in which the horse participates, deciding which parameters should be measured and their interpretation
- ♦ Establish the diagnostic protocol to be followed in the case of a horse with loss/ reduction/ lack of sporting performance
- ♦ Develop a protocol for the treatment and prevention of pathologies associated with physical exercise and training, including overtraining syndrome



A path to achieve training and professional growth that will propel you towards a greater level of competitiveness in the employment market"







## Specific Objectives

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- ◆ Examine respiratory, cardiovascular and musculoskeletal changes in response to submaximal and maximal, short and long duration, and intermittent exercises
- ◆ Understand the importance of histological and biochemical muscle changes with training and their impact on aerobic capacity and the respiratory, cardiovascular and metabolic response to exercise
- ◆ Establish how heart rate and blood lactate monitoring is performed, as well as measurement of ventilatory volumes and VO<sub>2</sub> oxygen consumption
- ◆ Identify the mechanisms of thermoregulation of a horse in sport, the associated pathologies, their consequences and the protocol of action in case of thermoregulatory alterations
- ◆ Specify training strategies to develop oxidative potential, strength and anaerobic capacity
- ◆ Present strategies to reduce or delay the onset of fatigue during various types of exercise



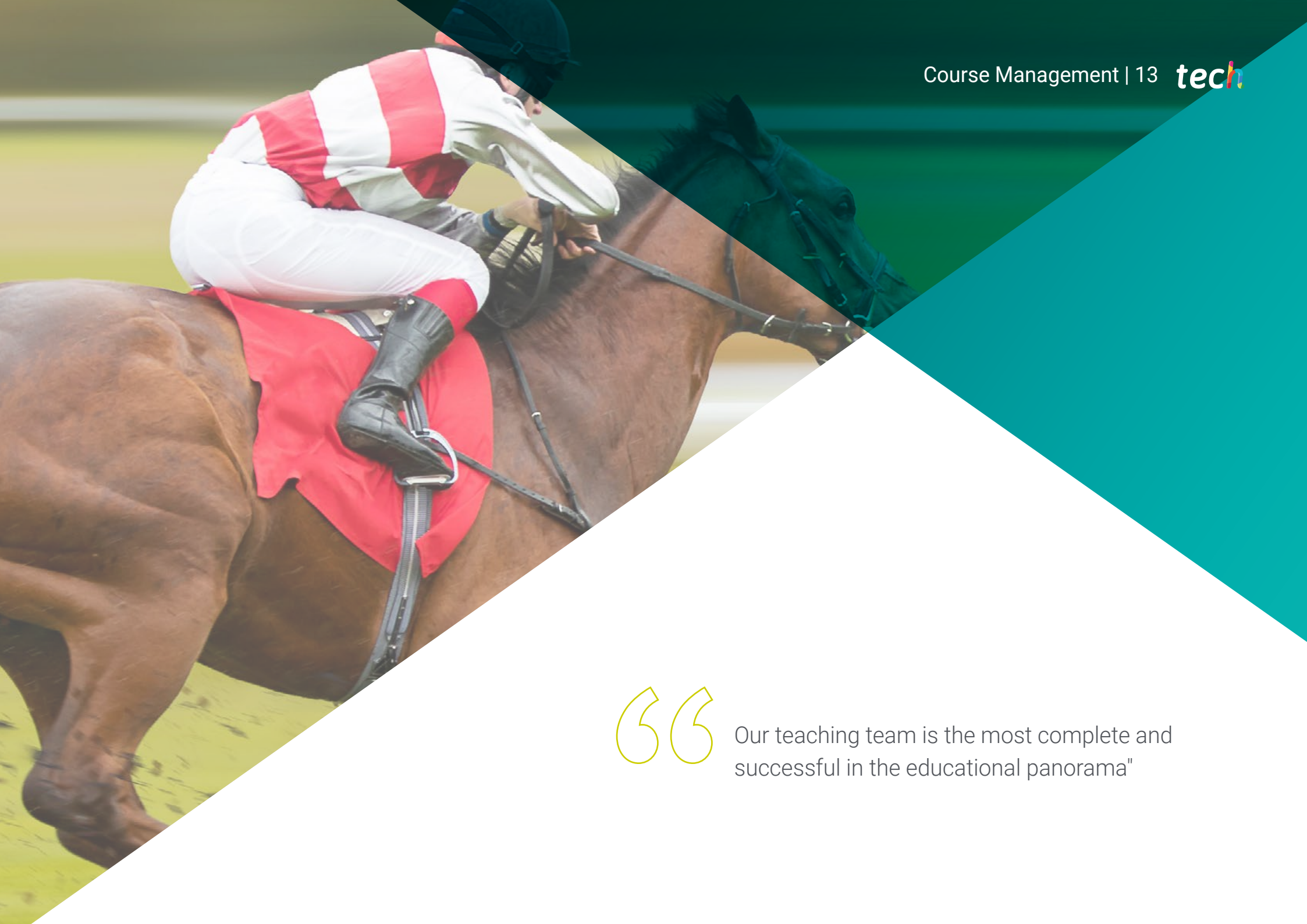


# 03

# Course Management

The program includes in its teaching staff reference experts in Equine Physiotherapy and Rehabilitation who pour into this training the experience of their work. They are world-renowned professionals from different countries with proven theoretical and practical professional experience.





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Our teaching team is the most complete and successful in the educational panorama”

## Management



### Dr. Hernández Fernández, Tatiana

- ♦ PhD in Veterinary Medicine from the UCM
- ♦ Diploma in Physiotherapy at the URJC
- ♦ Degree in Veterinary Medicine from the UCM
- ♦ Professor at the Complutense University of Madrid of: Expert in Equine Physiotherapy and Rehabilitation, Expert in the Foundations of Equine Rehabilitation and Physiotherapy Rehabilitation and Animal Physiotherapy, Expert in Physiotherapy and Rehabilitation of Small Animals, Diploma of Training in Podiatry and Farrier in Podiatry and Shoeing
- ♦ Resident in the area of Equidae at the Clinical Veterinary Hospital of the UCM
- ♦ Practical experience of more than 500 hours in hospitals, sports centers, primary care centers and human physical therapy clinics.
- ♦ More than 10 years working as a specialist in rehabilitation and physiotherapy





## Professors

### Dr. Muñoz Juzgado, Ana

- ◆ Doctorate in Veterinary Medicine from the University of Córdoba
- ◆ Degree in Veterinary Medicine from the University of Córdoba
- ◆ Professor in the Department of Animal Medicine and Surgery. Faculty of Veterinary Medicine of the University of Cordoba

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An impressive teaching staff, made up of professionals from different areas of expertise, will be your teachers during your training: a unique opportunity not to be missed”

04

# Structure and Content

The structure of the content has been designed by the best professionals in the Equine Physiotherapy and Rehabilitation sector, with extensive experience and recognized prestige in the profession, backed by the volume of cases reviewed, studied, and diagnosed, and with extensive knowledge of new technologies applied to Veterinary.







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We have the most complete and up-to-date educational program on the market. We strive for excellence and for you to achieve it too"



## Module 1. Exercise Physiology and Training

- 1.1. Systemic Adaptations to Physical Exercises of Different Intensity and Duration
  - 1.1.1. Introduction to Exercise Physiology and Comparative Exercise Physiology: What makes the horse the ultimate athlete and what are the consequences for the horse?
  - 1.1.2. Respiratory Adaptations to Exercise
    - 1.1.2.1. Airway Mechanics
    - 1.1.2.2. Physiological Adjustments During Exercise
  - 1.1.3. Cardiovascular Adaptations to Exercise
    - 1.1.3.1. Importance of the Cardiovascular System in Aerobic Capacity
    - 1.1.3.2. Interpretation of Heart Rate in Exercises of Different Intensity
  - 1.1.4. Metabolic Response to Exercise
  - 1.1.5. Thermoregulation During and After Exercise
- 1.2. Systemic Adaptations to Training
  - 1.2.1. Response of Respiratory Function to Training
  - 1.2.2. Cardiovascular Changes Associated with Training and their Consequences
  - 1.2.3. Metabolic Responses to Training and Associated Mechanisms Intervention of Training-Associated Muscle Modification
  - 1.2.4. Adaptive Response of Thermoregulatory Mechanisms to Training and Implications for the Equine Athlete
  - 1.2.5. Adaptations of Musculoskeletal Tissues to Training: Tendons, Ligaments, Bones, Joints
- 1.3. Design of an Exercise Test or Stress Test to Assess Physical Fitness Level
  - 1.3.1. Types of Stress Tests
    - 1.3.1.1. Treadmill and Field Stress Tests
    - 1.3.1.2. Maximum and Submaximal Intensity Tests
  - 1.3.2. Variables to Consider in the Design of a Stress Test
  - 1.3.3. Characteristics of Stress Tests for Speed, Jumping, Dressage and Endurance Horses
- 1.4. Physiological Parameters to Be Monitored During and After a Stress Test and Interpretation
  - 1.4.1. Respiratory Measures
    - 1.4.1.1. Ventilatory Measurements: Minute Ventilation, Tidal Volume
    - 1.4.1.2. Measurements of Pulmonary Mechanics
    - 1.4.1.3. Arterial Blood Gas Concentration
    - 1.4.1.4. Oxygen Consumption (VO<sub>2</sub>), Peak Consumption and Peak Consumption
  - 1.4.2. Cardiovascular Measures
    - 1.4.2.1. Heart Rate
    - 1.4.2.2. ECG
  - 1.4.3. Metabolic Measurements
  - 1.4.4. Gait Analysis
  - 1.4.5. Calculation and Interpretation of Functionality Indices Derived from Heart Rate and Lactate Response to Stress Testing: V<sub>2</sub>, V<sub>4</sub>, HR<sub>2</sub>, HR<sub>4</sub>, V<sub>150</sub>, V<sub>200</sub>
- 1.5. Diagnostic Approach to Loss/Lack of Performance Use of Stress Tests for the Diagnosis of Reduced Performance
  - 1.5.1. Factors Limiting Sports Performance According to Competition
  - 1.5.2. Diagnostic Approach to the Horse with Loss of Performance: Evaluation at Rest
  - 1.5.3. Diagnostic Approach to the Horse with Loss of Performance: Evaluation at Exercise
  - 1.5.4. Stress Tests for the Diagnosis of Loss of Performance
  - 1.5.5. Usefulness of Serial Stress Testing and Calculation of Functional Indices for Early Diagnosis of Performance Loss
- 1.6. General Basis of Training Training of the Three Essential Capacities: Endurance, Speed and Strength
  - 1.6.1. Basic Principles of Sports Training
  - 1.6.2. Capacity Training
    - 1.6.2.1. Resistance Training
    - 1.6.2.2. Speed Training
    - 1.6.2.3. Strength Training
  - 1.6.3. Periodization of Training Programming From Data Obtained in a Stress Test
- 1.7. Specific Training for Dressage, Show Jumping and Eventing
  - 1.7.1. Dressage
    - 1.7.1.1. Systemic Adaptations to Exercise during Dressage Testing
    - 1.7.1.2. Stress Tests Specific to the Dressage Horse
    - 1.7.1.3. Training for Dressage Horses



- 1.7.2. Show Jumping
  - 1.7.2.1. Systemic Adaptations to Exercise during Show Jumping Trials
  - 1.7.2.2. Specific Stress Tests for Dressage Horses
  - 1.7.2.3. Training for Show Jumping Horses
- 1.7.3. Complete Horseback Riding Competition
  - 1.7.3.1. Systemic Adaptations to Exercise During a Full Competition
  - 1.7.3.2. Specific Stress Tests for the All-Round Horse
  - 1.7.3.3. Training for All-Round Horses
- 1.8. Specific Training for Endurance and Speed
  - 1.8.1. Resistance and Endurance
    - 1.8.1.1. Systemic Adaptations to Exercise during Endurance Tests of Different Durations
    - 1.8.1.2. Specific Stress Tests for Resistance Horses
    - 1.8.1.3. Training for Resistance Horses
  - 1.8.2. Training for Race Horses
    - 1.8.2.1. Systemic Adaptations to Exercise During Speed Testing
    - 1.8.2.2. Specific Stress Tests for Race Horses
    - 1.8.2.3. Training for Race Horses
- 1.9. Overtraining Syndrome
  - 1.9.1. Definition and Types of Overtraining Syndrome
  - 1.9.2. Etiology and Pathophysiology
  - 1.9.3. Hematological, Endocrine, Muscular and Behavioral Changes Compatible with Overtraining
- 1.10. Excessive Fatigue or Exhaustion Diagnosis, Treatment and Prevention Pathologies Associated to Physical Exercise
  - 1.10.1. Definition of Exhaustion vs. Fatigue Pathophysiology of the Exhaustion and Post-Exhaustion Syndrome
  - 1.10.2. Pathophysiological Mechanisms Associated With Water-Electrolyte Imbalances and Energy Substrate Depletion
  - 1.10.3. Specific Pathologies Within the Exhaustion Syndrome: Exercise Hyperthermia/ Heat Stroke, Flutter K or Synchronous Diaphragmatic Flutter, Colic, Diarrhea, Laminitis, Metabolic Encephalopathy, Renal Failure
  - 1.10.4. Medical Management of the Exhausted Horse
  - 1.10.5. Exhaustion prevention strategies: before, during and after competition



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 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 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, in an attempt to recreate the actual conditions in a veterinarian'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. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
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. The feeling that the effort invested is effective becomes a very important motivation for veterinarians, which translates into a greater interest in learning and an increase in the 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.



Veterinarians 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 65,000 veterinarians have been trained with unprecedented success in all clinical specialties, regardless of the surgical load. Our teaching method is developed in a highly demanding environment, where the students have a high socio-economic profile and an average age of 43.5 years.

Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.

In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

The overall score obtained by 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.



### Latest Techniques and Procedures on Video

TECH introduces students to the latest techniques, the latest educational advances and to the forefront of current and procedures of veterinary 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 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 Certificate in Exercise Physiology guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.





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



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

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery\*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations and professional career evaluation committees.

Title: **Postgraduate Certificate in Exercise Physiology**

Official N° of Hours: **150 h.**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH EDUCATION 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 training  
development language  
virtual classroom

**tech** technological  
university

## Postgraduate Certificate

### Exercise Physiology

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