Postgraduate Certificate
Cardiovascular Physiology in Large Animals

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Postgraduate Certificate

Cardiovascular Physiology in Large Animals

- Modality: **online**
- Duration: **3 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Website: www.techtitute.com/in/veterinary-medicine/postgraduate-certificate/cardiovascular-physiology-large-animals

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01

Introduction

Cardiac diseases in large animals are highly significant, so it is important for the physician to have specialized knowledge in cardiac disorders and an advanced knowledge of cardiovascular pathophysiology.

Identifying the cause is key when it comes to recommending the best treatment for each pathology, depending on the species we are treating.

There are very few courses that, like this one, provide such extensive knowledge for understanding cardiac pathology, pathophysiology and response to drugs, with an in-depth understanding of the mechanism of action in the context of the large animals.

Give your career the boost it needs by specializing in Cardiovascular Physiology in Large Animals, with the best teaching staff and the most up-to-date teaching resources on the market.

This program is the best option you can find to specialize in Veterinary Cardiology and make more accurate diagnoses"

Cardiovascular disorders in animals are highly significant because they can affect their quality of life and life expectancy. Advanced knowledge of cardiology is indispensable for large animal veterinarians: ruminants (cattle, sheep, goats), camelids (alpacas, camels and llamas), swine (pigs, wild boars) and equidae (donkeys and mules).

Cardiology in ruminants and swine has been limited for a long time due to the limited literature and diagnostic limitations, especially in advanced therapeutic procedures.

Regarding Equidae, a high number of horses are used for sporting purposes and cardiac pathologies limit their capacity and even force the animal to withdraw from competition. This is more evident the more demanding the equine is in terms of sport and cardiovascular effort. The management of food species differs, but it also affects their production capacity.

In recent years, there has been a boom in the development of novel diagnostic and therapeutic techniques, such as intracardiac electrocardiograms, electrophysiological mapping in arrhythmias, pacemaker implantation and other intracardiac devices that can be implemented in larger species. These advances, which are necessary for an adequate clinical approach, are not available in books.

Therefore, this Postgraduate Certificate offers a comprehensive and well-developed syllabus that addresses advanced cardiology topics, providing detailed descriptions of the different procedures performed depending on the species, as well as a guide for clinical decision-making and patient selection.

This program covers the basics of Cardiology and delves into the most up-to-date and advanced techniques currently available, offering extensive and in-depth content. Moreover, access to exclusive masterclasses taught by a recognized international expert in the field of veterinary cardiology is guaranteed. In this way, participants will be able to incorporate the latest techniques and most advanced clinical treatments into their daily practice.

The Postgraduate Certificate in Cardiovascular Physiology in Large Animals brings together all the detailed information in the different areas of Cardiology at a high and advanced level of specialization and is taught by renowned professors in the field of internal medicine, cardiology and minimally invasive surgery in veterinary medicine.

This **Postgraduate Certificate in Cardiovascular Physiology in Large Animals** contains the most complete and up-to-date educational program on the market. The most important features of the program include:

- Development of practical cases presented by experts in Cardiovascular Physiology in Large Animals
- The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice.
- The latest developments in Cardiovascular Physiology in Large Animals
- Practical exercises where self-assessment can be used to improve learning.
- Special emphasis on innovative methodologies in Cardiovascular Physiology in Large Animals
- 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

You will have unique masterclasses that will present you with the most relevant international advances in Cardiovascular Physiology"

This Postgraduate Certificate is the best investment you can make when selecting a refresher program to update your knowledge in Cardiovascular Physiology in Large Animals"

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 balance your studies with your professional work while increasing your knowledge in this field.

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 specialist 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 Cardiovascular Physiology in Large Animals.

02

Objectives

The Postgraduate Certificate in Cardiovascular Physiology in Large Animals is designed to facilitate the performance of veterinary professionals with the latest advances and the most innovative treatments in the sector.

Learn about the latest advances in the field from the comfort of your home, thanks to the online format on which this program is based"

General Objectives

- Recognize the mechanisms involved in the genesis of arrhythmias
- Identify the basis of cardiac pathophysiology of syncope and heart failure
- Detail the mechanisms of action, adverse effects and contraindications of drugs used in the cardiovascular area
- Learn about cardiovascular system adaptations to exercise and how they apply to examining sports horses
- Identify all clinical signs associated with cardiovascular overtraining and undertraining
- Establish cardiovascular fitness assessment methods
- Know the complementary tests used to evaluate horses with heart disease during exercise.
- Establish an accurate criterion to address performance decline and sudden death in horses.

Join one of the largest online universities in the world"

Specific Objectives

- Analyze the arrhythmogenic bases and classify them according to the causative mechanism.
- Recognize the main mechanisms underlying syncope
- Differentiate the mechanisms leading to the onset of heart failure
- Establish the different pathways activated in heart failure.
- Detail the control of the organism in heart failure.
- Describe and detail the pharmacological groups with action on the cardiovascular system
- Specify the indications for antiarrhythmic drugs, their mechanism of action and adverse effects.
- Generate specialized knowledge on the cardiovascular fitness required according to discipline and the different training methods
- Specify the information required in clinical examination of sports horses
- Precisely examine the cardiovascular and hematological adaptations resulting from cardiovascular training
- Analyze the different cardiovascular training methods according to discipline
- Differentiate between the symptoms of overtraining and cardiovascular detraining
- Propose a methodology for assessing cardiovascular fitness of horses
- Establish working protocols for the clinical evaluation of cardiac horses during performance
- Identify cardiac pathologies that decrease performance and cardiac pathologies that increase the risk of sudden death
- Establish criteria for assessing the risk of sudden death in horses

03

Course Management

The program's teaching staff includes leading experts in Cardiac Physiology and Pathophysiology in Large Animals who contribute their vast work experience to this educational program. Renowned professionals have joined forces to offer you this high-level program.

Our teaching faculty, experts in Cardiovascular Physiology in Large Animals, will help you achieve success in your profession"

International Guest Director

Dr. Brian Scansen is a professor and chief of cardiology and cardiac surgery Pharmacodynamics. at Colorado State University. In addition, he is a member of the editorial board of the Journal of Veterinary Cardiology and gives international conferences on heart diseases in animals. His clinical and research interests focus on**congenital heart disease, advanced cardiac imaging, and minimally invasive therapies.**

Recently **has led several sessions on cardiac disease in dogs and cats.** at veterinary conferences. In these sessions, Scansen addressed mitral valve disease in dogs and presented new therapies and strategies in development to treat heart disease and heart failure in dogs. He shared information about the progression of the disease and highlighted the importance of identifying dogs at risk for heart failure.

Regarding his academic career, Scansen **graduated from veterinary school at Michigan State University, where he graduated with Doctor of Veterinary Medicine and Master of Science degrees..** He subsequently completed a fellowship in Interventional Radiology and Endoscopy at the University of Pennsylvania and Animal Medical center, New York.

He has published more than 200 original journal articles, book chapters, proceedings and scientific abstracts related to heart diseases in animals. Moreover, he is **a member of the Editorial Committee of the Journal of Veterinary Cardiology and Founding Member of the Society of Veterinary Interventional Radiology and Interventional Endoscopy.**

Dr. Scansen, Brian

- Chief of the cardiology and cardiac surgery service at Colorado State University
- PhD in Medicine from the University of Michigan
- Doctor of Science, University of Michigan
- Member of the editorial board of the Journal of Veterinary Cardiology
- Author of more than 200 original articles in magazines, book chapters, minutes and scientific summaries related to heart disease in animals

Thanks to TECH you will be able to learn with the best professionals in the world"

Management

Dr. Villalba Orero, María

- Scientific Advisor on cardiovascular and pulmonary ultrasound at the National Center for Cardiovascular Research
- Head and Founder of MVO Equine Cardiology
- Head of the Equine Anesthesia Service at Asurvet Equidos
- Doctor of Veterinary Medicine, Complutense University of Madrid.
- Degree in Veterinary Medicine from the Complutense University Madrid
- Master's Degree in Veterinary Sciences from the Complutense University of Madrid
- Master's Degree in Veterinary Cardiology
- Certificate European Certificate in Veterinary Cardiology by the European School of Veterinary Postgraduate Studies (ESVPS)

Professors

Ms. Pradillo Martínez, Alicia

- Equine Trainer and Veterinarian in Private Company
- Researcher in the Scientific Project with INDIBA Animal Health
- Degree in Veterinary Medicine from the Complutense University Madrid

Dr. Sancho Afonso, Tiago

- Specialist in Veterinary Cardiology and Internal Medicine in Larger Species
- Senior Lecturer in Equine Internal Medicine at the Massey University Equine Veterinary Clinic. New Zealand
- Senior Lecturer in Equine Internal Medicine at the Equine Health and Performance Center from the University of Adelaide. Australia
- Senior Internal Medicine Veterinarian at Goulburn Valley Equine Hospital. Congupna, Australia
- PhD in Veterinary Medicine from the University of Georgia. United States.
- Doctoral Thesis with a research topic in Equine Cardiology at the University of Georgia
- Degree in Veterinary Medicine from the University of Lisbon. Portugal
- Master in Veterinary Medicine from the Technical University of Lisbon
- Diploma in the Specialty of Large Animal Internal Medicine from the American College of Veterinary Internal Medicine

Dr. Troya Portillo, Lucas

- Veterinary Doctor Expert in Equine Clinic
- Internal Medicine and Equine Anesthesiologist at the Veterinary Clinical Hospital of Barcelona
- Researcher at the Department of Animal Medicine and Surgery at the Autonomous University of Barcelona
- Researcher in Veterinary Medicine with the Institute of Applied Studies
- Master's Degree in Clinic at Complutense University Madrid
- Degree in Veterinary Medicine from the Complutense University of Madrid
- Member of the Association English of Equine Veterinary Specialists

04

Structure and Content

The structure of the content has been designed by the best professionals in the field of Cardiovascular Physiology in Large Animals, 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 studies.

This Postgraduate Certificate contains the most complete and up-to-date scientific program on the market"

Module 1. Complementary Non-Invasive Cardiovascular Tests in Large Animals: Equidae, Ruminants, Swine

1.1. General Echocardiography Concepts
- 1.1.1 Ultrasound Characteristics
- 1.1.2 Ultrasound-Tissue Interaction
- 1.1.3 Ultrasound Image Formation
- 1.1.4 Equipment Features

1.2. Basic Ultrasound Modes
- 1.2.1 M-mode Ultrasound
- 1.2.2 Two-Dimensional Ultrasound
- 1.2.3 Doppler Technique
- 1.2.4 *Speckle Tracking*

1.3. Special Ultrasound Modes and Cardiac Formulas
- 1.3.1 Contrast Ultrasound
- 1.3.2 Stress Ultrasound
- 1.3.3 Transesophageal Ultrasound
- 1.3.4 Fetal Cardiac Ultrasound
- 1.3.5 Cardiac Formulas

1.4. Ultrasound Views
- 1.4.1 Right Hemithorax Views
- 1.4.2 Left. Hemithorax Views

1.5. Electrocardiogram Interpretation
- 1.5.1 Assessing Cardiac Function
- 1.5.2 Assessment of the Structure and Dimensions of the Chambers

1.6. What is an Electrocardiogram?
- 1.6.1 Anatomical and Electrophysiological Foundations
- 1.6.2 What Is It and How Does It Originate?

1.7. Recording Techniques
- 1.7.1 Einthoven's Classical System
- 1.7.2 Base-Apex Systems and Handheld Devices
- 1.7.3 Electrocardiogram Acquisition Modes

1.8. Electrocardiogram Interpretation
- 1.8.1 Normal Electrocardiogram
- 1.8.2 Determining Heart Rate
- 1.8.3 Interpreting Heart Rate
- 1.8.4 Electrocardiogram Waveform Interpretation

1.9. Electrocardiogram Abnormalities
- 1.9.1 Artefacts
- 1.9.2 Wave Morphological Abnormalities

1.10. How to Deal with an Electrocardiogram?
- 1.10.1 Reading Protocol
- 1.10.2 Tricks

Module 2. Cardiac Response to Exercise, Sports Performance and Sudden Death in Sports Horses

2.1. The Cardiovascular System
- 2.1.1 Anatomical Review
- 2.1.2 Blood
- 2.1.3 Cardiovascular Function During Exercise
- 2.1.4 Cardiovascular Response to Exercise

2.2. Energy Production During Exercise
- 2.2.1 ATP.
- 2.2.2 Metabolic Routes
- 2.2.3 Anaerobic Threshold
- 2.2.4 Interrelation of the Different Energy Systems
- 2.2.5 Oxygen Consumption

2.3. Practical Aspects of Physical Preparation
- 2.3.1 Basic Principles
- 2.3.2 Cardiovascular Fitness
- 2.3.3 Cardiovascular Overtraining
- 2.3.4 Cardiovascular Detraining

2.4. Discipline-Specific Cardiovascular Fitness Training
- 2.4.1 Dressage
- 2.4.2 Jump
- 2.4.3 Full Competition
- 2.4.4 Raid
- 2.4.5 Racing
- 2.4.6 Polo

2.5. Cardiovascular Fitness Assessment Test
- 2.5.1 Test Under Controlled Conditions
- 2.5.2 Field Test

2.6. Complementary Tests to Assess Clinical Relevance Cardiac Pathologies During Exercise
- 2.6.1 Exercise Electrocardiography
- 2.6.2 Post-Exercise Echocardiography

2.7. Laboratory Analysis for Cardiac Pathology Evaluation
- 2.7.1 Respiratory System Samples
- 2.7.2 CK
- 2.7.3 Troponins
- 2.7.4 BNP
- 2.7.5 ANP

2.8. Cardiac Pathologies Affecting Sports Performance
- 2.8.1 Arrhythmias
- 2.8.2 Structural Pathologies

2.9. Sudden Death
- 2.9.1 Definition and Prevalence
- 2.9.2 Clinical Assessment of Sudden Death Risk

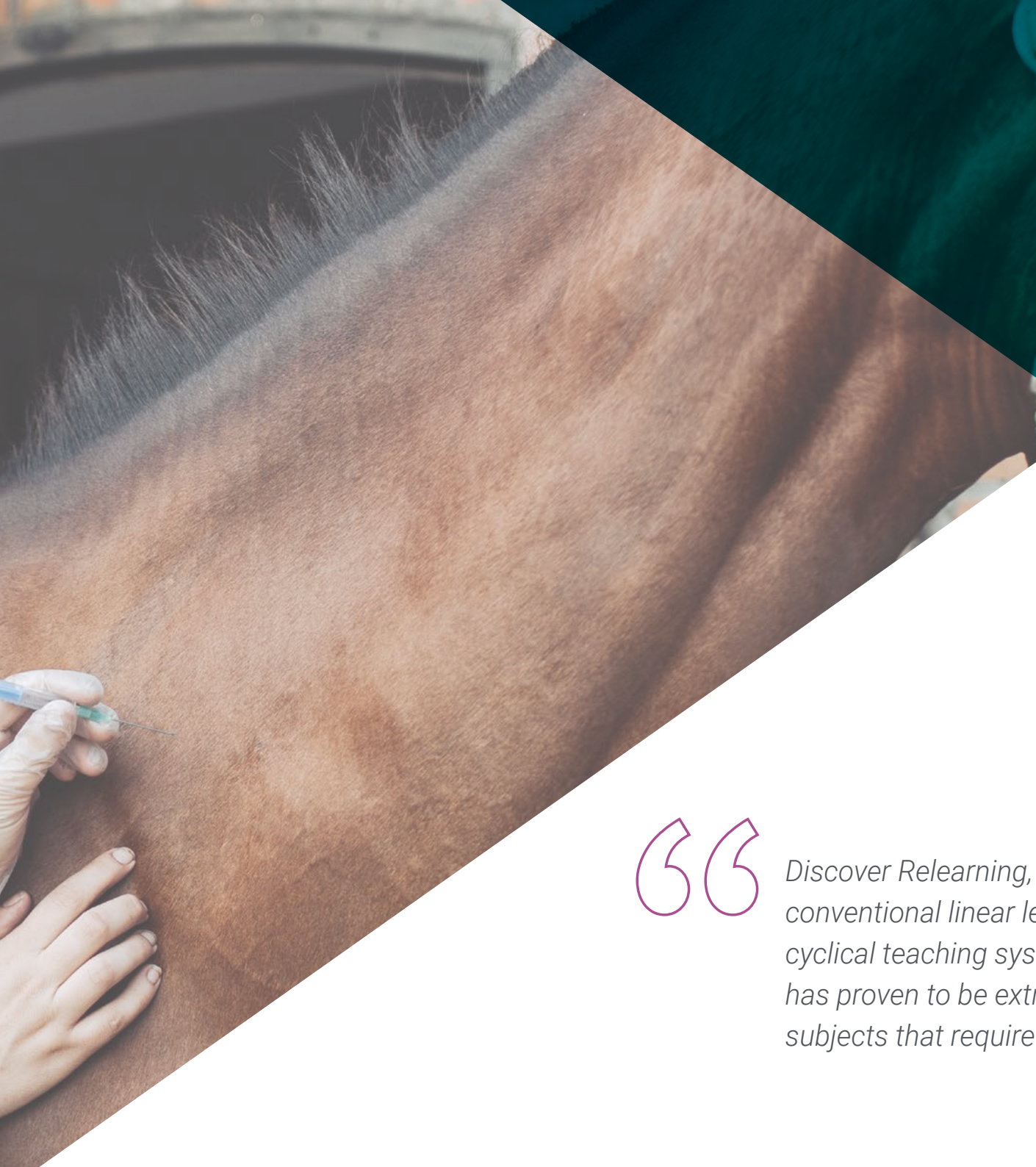
2.10. Cardiac Pathologies Related to Sudden Death
- 2.10.1 Arrhythmias
- 2.10.2 Structural Pathologies

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.

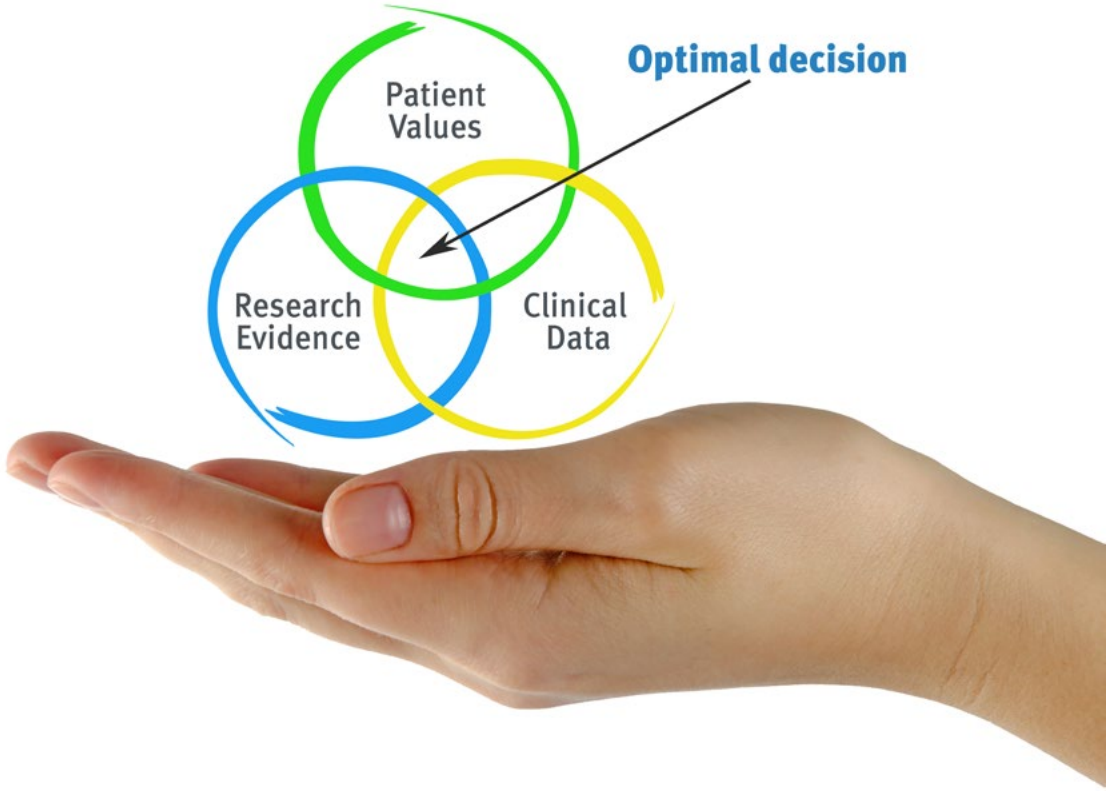


Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"

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.

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:

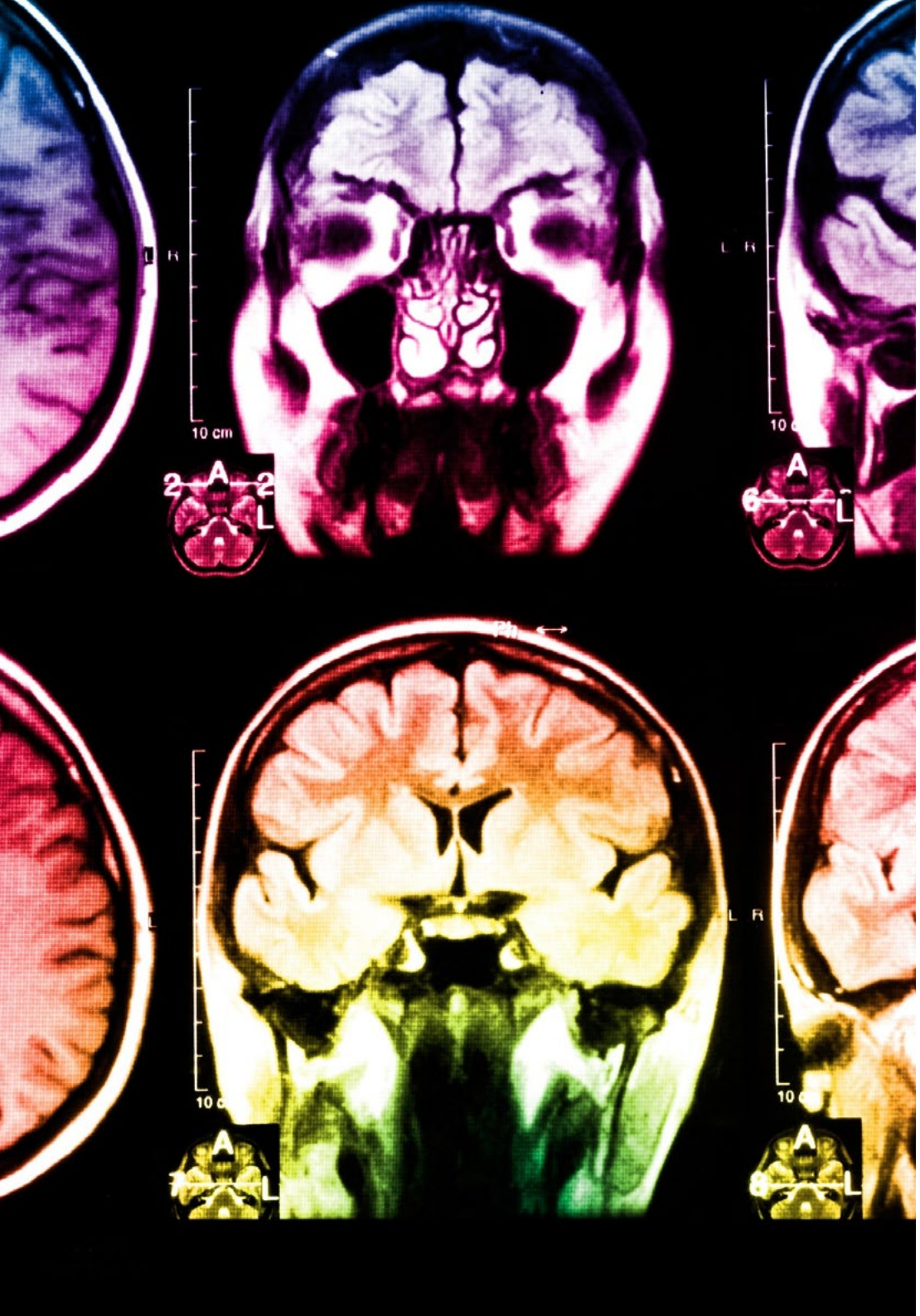
1. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real 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.

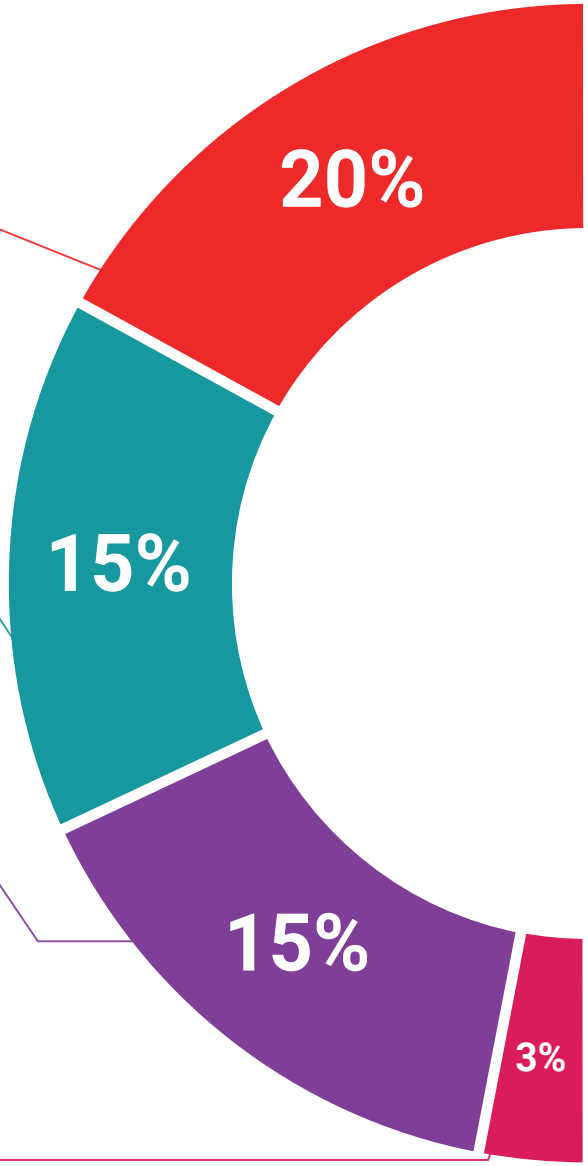
Interactive Summaries

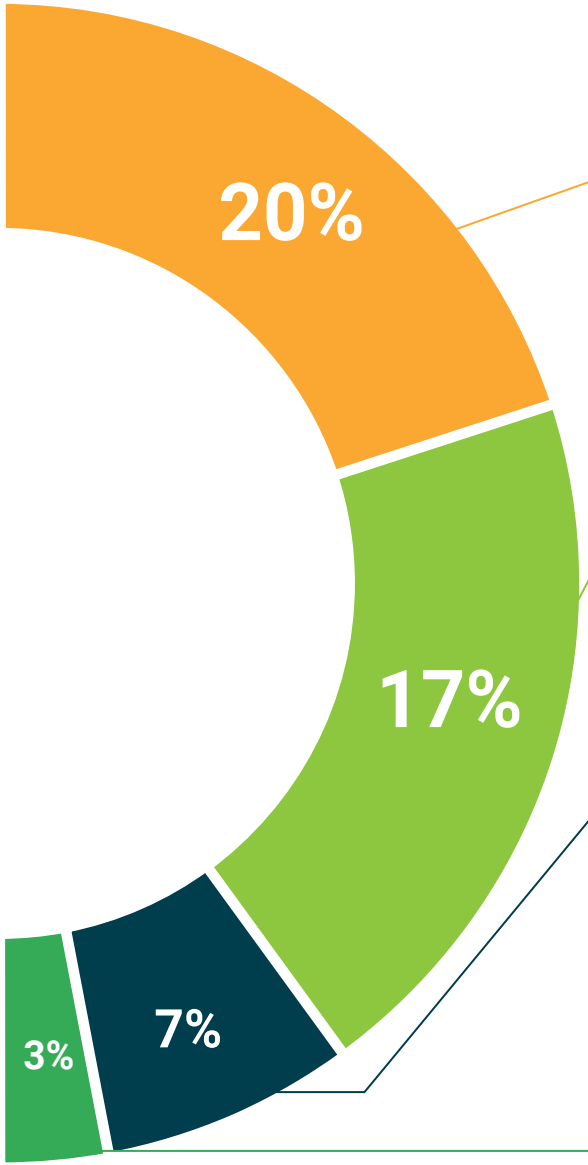
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Cardiovascular Physiology in Large Animals guarantees students, in addition to the most rigorous and up-to-date education, access to a certificate issued by TECH Technological University.

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

This **Postgraduate Certificate in Cardiovascular Physiology in Large Animals** 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 certificate 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 Cardiovascular Physiology in Large Animals**

Official Nº of Hours: **300 h.**


tech technological university

Awards the following

CERTIFICATE

to

Mr./Ms. _____, with identification number _____.

For having passed and accredited the following program

POSTGRADUATE CERTIFICATE

in

Cardiovascular Physiology in Large Animals

This is a qualification awarded by this University, equivalent to 300 hours, with a start date of dd/mm/yyyy and an end date of dd/mm/yyyy.

TECH is a Private Institution of Higher Education recognized by the Ministry of Public Education as of June 28, 2018.

June 17, 2020

Tere Guevara Navarro

Dean

This qualification must always be accompanied by the university degree issued by the competent authority to practice professionally in each country. Unique TECH Code: AFWORD23S techtitute.com/certificates

*Apostille Convention. In the event that the student wishes to have their paper certificate issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

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Postgraduate Certificate

Cardiovascular Physiology in Large Animals

- Modality: **online**
- Duration: **3 months**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

Postgraduate Certificate
Cardiovascular Physiology in Large Animals

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