Postgraduate Certificate

Cardiac Physiology and Pathophysiology in Large Animals

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Postgraduate Certificate
Cardiac Physiology and Pathophysiology in Large Animals

- Modality: **online**
- Duration: **12 weeks**
- Certificate: **TECH Technological University**
- Dedication: **16h/week**
- Schedule: **at your own pace**
- Exams: **online**

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

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01

Introduction

The embryological development of the heart is highly complex and requires in-depth and detailed study. All mammals have a similar embryology and anatomy, but they differ in the timing of the final formation of the mature heart, depending on the gestation period.

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.

This program covers cardiac physiology and pathophysiology in detail. Understanding how the heart works, i.e., electrical, muscular and hormonal functioning, lays the foundations for a more accurate approach to pathologies and a better understanding of how to treat them.

Veterinarians must continue their training to adapt to new developments in this field"

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.

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

- Practical cases presented by experts in Cardiac Physiology and Pathophysiology 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 development
- Latest developments in Cardiac Physiology and Pathophysiology in Large Animals
- Practical exercises where self-assessment can be used to improve learning.
- Special emphasis on innovative methodologies in Cardiac Physiology and Pathophysiology 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

"Don't miss the opportunity to study this Postgraduate Certificate with us. It's the perfect opportunity to advance your career and stand out in an industry with high demand for professionals"

This Postgraduate Certificate is the best investment you can make in the selection of a refresher program to update your knowledge in Cardiac Physiology and Pathophysiology in Large Animals"

This training 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.

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 specialist must try to solve the different professional practice situations that arise during the academic year. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced experts in Cardiac Physiology and Pathophysiology in Large Animals.

02

Objectives

The Postgraduate Certificate in Cardiac Physiology and Pathophysiology in Large Animals is designed to enhance 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

- Analyze the embryological development of the different cardiac structures
- In-depth development of the fetal circulation and its evolution to the adult animal
- Examine cardiac anatomy and its topography in the thoracic cavity in depth
- Establish the basic principles of cardiovascular functioning
- Generate specialized knowledge in cardiac physiology
- 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

An experience of unique, key training and decisive to promote your professional development"

Specific Objectives

- Specify the foundations of embryonic development
- Establish the foundations of possible cardiac malformations
- In-depth examination of the cardiac structure
- Analyze the microscopic characteristics of the heart
- Develop the concepts of the electrical activity of the heart.
- Examine the characteristics of cardiomyocytes.
- Generate specialized knowledge about ion channels and action potentials
- 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.

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 Cardiac Physiology and Pathophysiology 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. Mateos Pañero, María

- Veterinarian Expert in Cardiology in Small Animals
- Professor of Small Animal Cardiology at the Small Animal University Hospital
- Animals. Liverpool
- Cardiologist at Northwest Veterinary Specialists
- Graduate in Veterinary Medicine from the University of Extremadura
- General Practitioner Certificate in Cardiology
- Rotating Cardiology Practices at the Istituto Veterinario di Novara
- Cardiology Specialist Internship at the Istituto Veterinario di Novara

Dr. Sanchez Afonso, Tiago

- Specialist in Veterinary Cardiology and Internal Medicine in Larger Species
- Full Professor of Equine Internal Medicine at the Massey Equine Veterinary Clinic
- University. 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
- Doctor in Veterinary Medicine from the University of Georgia. USA
- Doctoral Thesis with a research topic in Equine Cardiology at the University from Georgia
- Graduate 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

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. Cardiac Embryology, Anatomy and Physiology in Large Animals: Equidae, Ruminants and Swine

1.1. Embryology I. Cardiac Tube and Cardiac Loop Formation
- 1.1.1. Cardiac Tube Formation
- 1.1.2. Cardiac Loop Formation

1.2. Embryology II. Formation of Cardiac Septa and Major Blood Vessels, Fetal and Transitional Blood Circulation
- 1.2.1. Cardiac Septa Formation
- 1.2.2. Major Blood Vessel Formation

1.3. Embryology III. Fetal and Transitional Blood Circulation
- 1.3.1. Fetal and Transitional Blood Circulation

1.4. Cardiac Anatomy I. Key Aspects
- 1.4.1. General Data
- 1.4.2. Orientation in the Thoracic Cavity.
- 1.4.3. Pericardium

1.5. Cardiac Anatomy II. Heart and Coronary Blood Vessels. Atria, Ventricles and Conduction System
- 1.5.1. Heart and Coronary Blood Vessels
- 1.5.2. Atria and Ventricles
- 1.5.3. Conduction System

1.6. Cardiac Physiology I. Cardiac Cycle, Cardiac Metabolism, Cardiac Muscle
- 1.6.1. Cardiac Cycle
- 1.6.2. Cardiac Metabolism
- 1.6.3. Ultrastructure of Cardiac Muscle

1.7. Cardiac Physiology II. Systolic Heart Function I
- 1.7.1. Preload
- 1.7.2. Afterload

1.8. Cardiac Physiology III. Systolic Heart Function II
- 1.8.1. Contractility
- 1.8.2. Hypertrophy
- 1.8.3. Wall Stress Curves

1.9. Cardiac Physiology IV. Flows and Neurohormonal Control of Circulation
- 1.9.1. Blood Flow.
- 1.9.2. Coronary Flow.
- 1.9.3. Neurohormone Control of Circulation

1.10. Cardiac Physiology V. Ion Channels and Action Potentials
- 1.10.1. Ion Channels
- 1.10.2. Action Potential

Module 2. Cardiovascular pathophysiology and pharmacology in large animals: equidae, ruminants and swine.

2.1. Pathophysiology of Arrhythmias
- 2.1.1. Arrhythmogenic Mechanisms

2.2. Syncope Pathophysiology
- 2.2.1. Collapse and Syncope
- 2.2.2. Mechanisms Involved in Syncope
- 2.2.3. Types of Syncope According to the Mechanism Involved

2.3. Heart Failure Pathophysiology
- 2.3.1. Definition
- 2.3.2. Mechanisms Involved

2.4. Types of Heart Failure
- 2.4.1. Systolic and Diastolic
- 2.4.2. Left and Right
- 2.4.3. Acute and Chronic

2.5. Compensatory Mechanisms in Heart Failure
- 2.5.1. Sympathetic Response
- 2.5.2. Endocrine Response
- 2.5.3. Nurohumoral Response

2.6. Cardiovascular Pharmacology I. Diuretics and Vasodilators
- 2.6.1. Diuretics
- 2.6.2. Vasodilators

2.7. Cardiovascular Pharmacology II. Calcium Channel Blockers and Digitalis
- 2.7.1. Calcium Blockers
- 2.7.2. Digitalis

2.8. Cardiovascular Pharmacology III. Adrenergic and Dopaminergic Receptor Agonists
- 2.8.1. Adrenergic
- 2.8.2. Dopaminergics

2.9. Antiarrhythmics I
- 2.9.1. Class I
- 2.9.2. Class II

2.10. Antiarrhythmics II
- 2.10.1. Class III
- 2.10.2. Others

"Achieve professional success with this high-level training provided by prestigious professionals with extensive experience in the sector"

05

Methodology

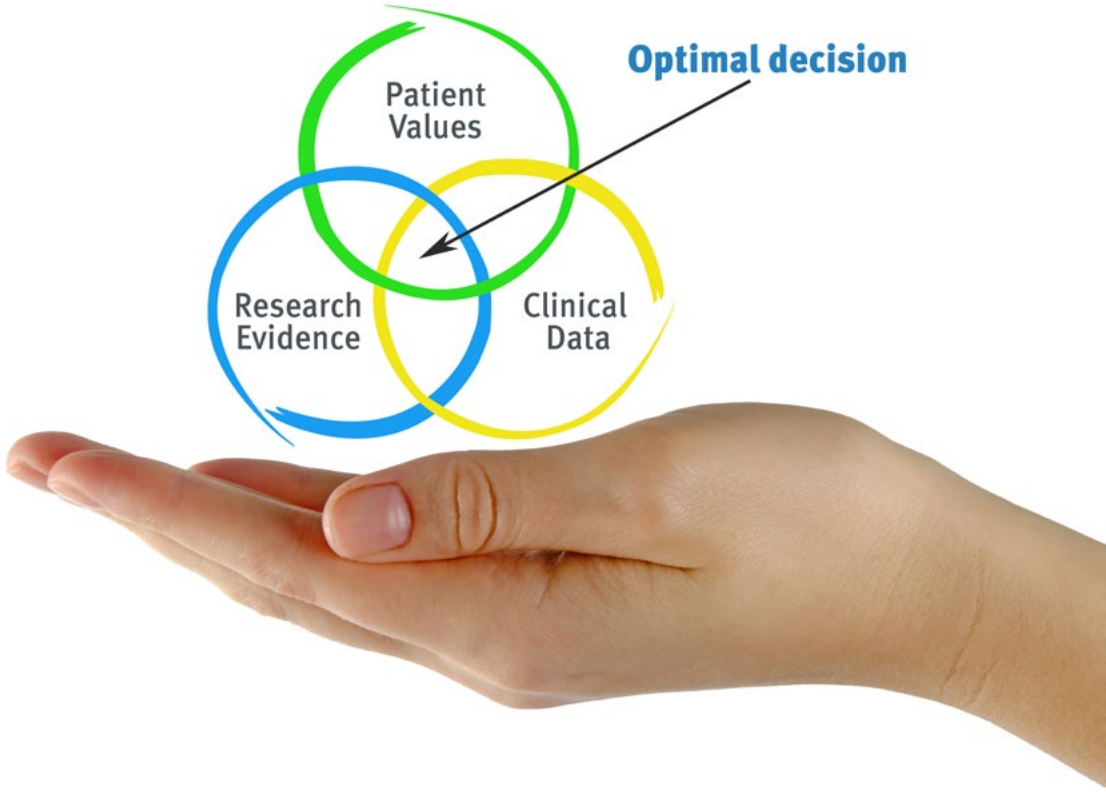
This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning.**
This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** 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:

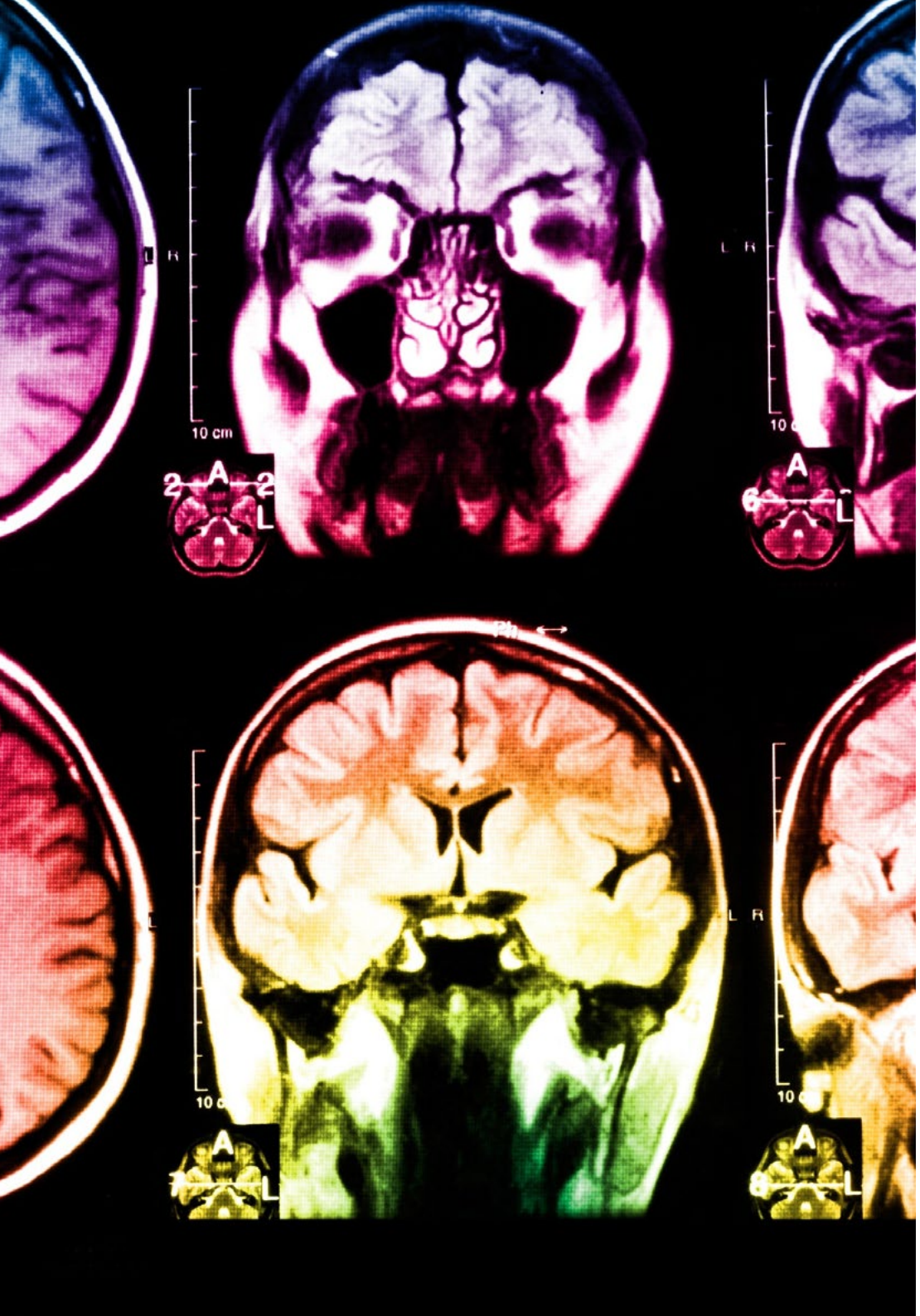
1. Veterinarians who follow this method not only manage to assimilate concepts, but also develop their mental capacity through exercises to evaluate real situations and knowledge application
2. Learning is solidly translated into practical skills that allow the student to better integrate into the real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

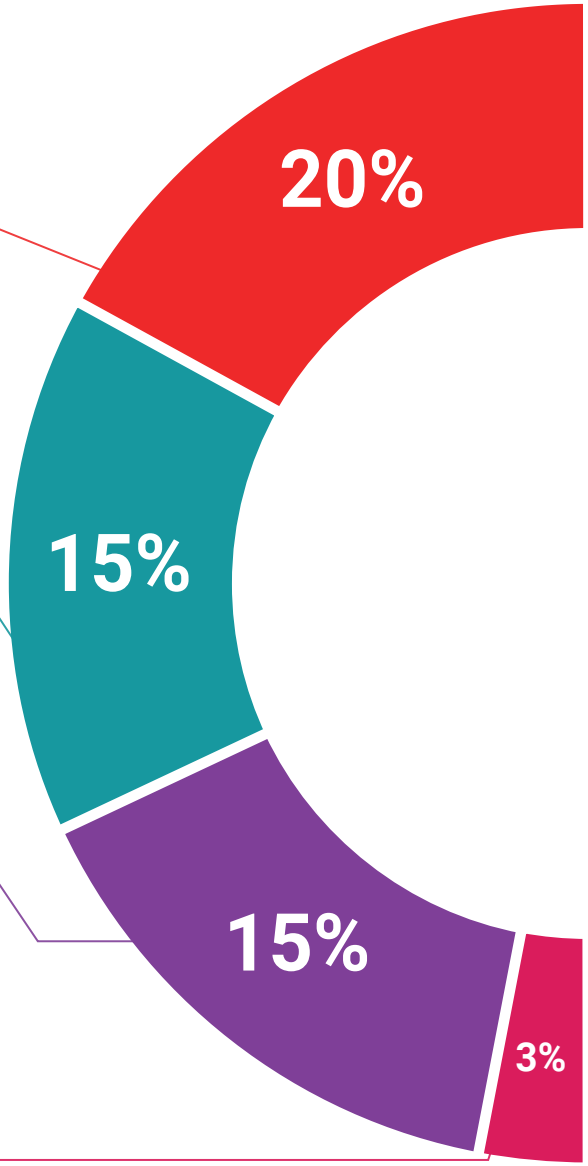
Interactive Summaries

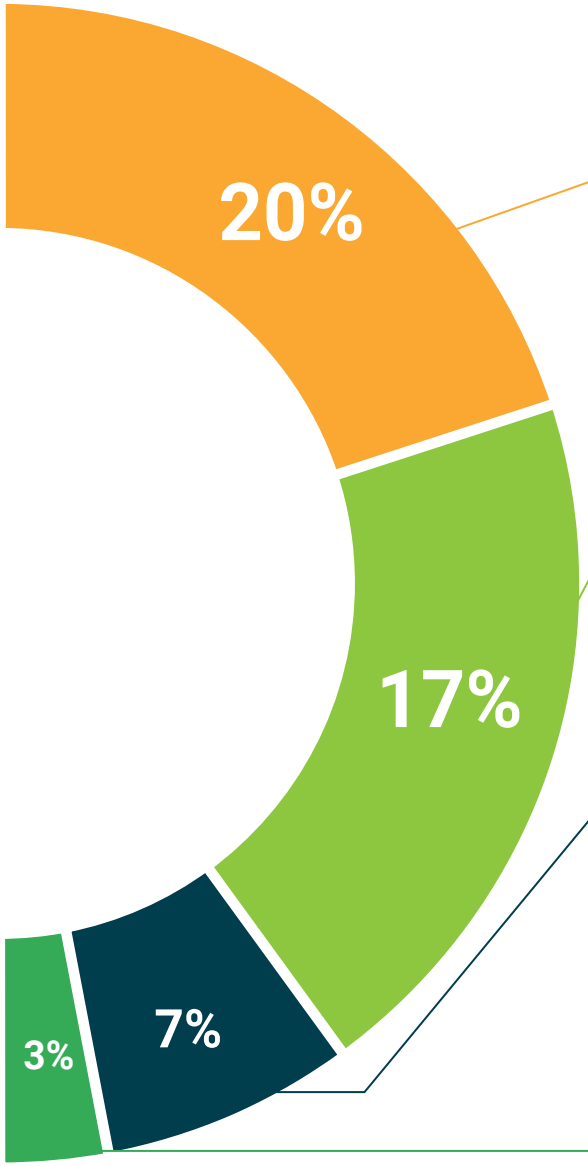
The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

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 Cardiac Physiology and Pathophysiology 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 travel or laborious paperwork"

This **Postgraduate Certificate in Cardiac Physiology and Pathophysiology 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 Cardiac Physiology and Pathophysiology 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

Cardiac Physiology and Pathophysiology 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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