

# Postgraduate Certificate Cardiac Ultrasound in Small Animals





## Postgraduate Certificate Cardiac Ultrasound in Small Animals

Course Modality: **Online**

Duration: **2 months.**

Certificate: **TECH - Technological University**

**12 ECTS Credits**

Teaching Hours: **300 hours**

Website: [www.techtitute.com/us/veterinary-medicine/postgraduate-certificate/cardiac-ultrasound-small-animals](http://www.techtitute.com/us/veterinary-medicine/postgraduate-certificate/cardiac-ultrasound-small-animals)

# Index

01

Introduction

---

*p. 4*

02

Objectives

---

*p. 8*

03

Course Management

---

*p. 12*

04

Structure and Content

---

*p. 16*

05

Methodology

---

*p. 22*

06

Certificate

---

*p. 30*

# 01

# Introduction

Cardiac ultrasound is a very powerful tool for the diagnosis and monitoring of cardiac conditions, whether acquired or congenital, so establishing a correct and accurate examination protocol is of vital importance for the interpretation of the results.

For this reason, it is essential for veterinarians to be constantly updated in order to offer a quality service to the patient.





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*Tackle the daily challenges you may face in Cardiac Ultrasound in Small Animals with this high-level program designed by and for veterinarians"*

Echocardiographic study is very dependent on the observer, so the module will provide the keys to minimize these situations as much as possible.

Throughout this program the different imaging methods used in cardiac ultrasound, through which we obtain the necessary measurements for the diagnosis of heart disease.

Having studied the basics of cardiac ultrasound, we will focus on how to evaluate and diagnose the main cardiac conditions for which echocardiography is one of the main tools for diagnosis, evaluation and patient follow-up.

During these weeks we will address the most common cardiac diseases that we can describe with echocardiography in both dogs and cats. Putting special emphasis on those parameters that allow us to differentiate between one illness and another.

In addition, we will lay the theoretical foundation for two advanced imaging tests related to echocardiography: 3D cardiac ultrasound and transesophageal echocardiography.

With this specialization you will develop confidence, assurance and greater knowledge of pathologies and differential diagnoses when it comes to providing relevant and necessary information in daily ultrasound practice.

As it is an online Postgraduate Certificate course, students are not restricted by set timetables, nor do they need to physically move to another location. All of the content can be accessed at any time of the day, so you can balance your working or personal life with your academic life.

This **Postgraduate Certificate in Cardiac Ultrasound in Small Animals** offers you the advantages of a high-level scientific, teaching, and technological course. These are some of its most notable features:

- ◆ The latest technology in online teaching software.
- ◆ Highly visual teaching system, supported by graphic and schematic contents that are easy to assimilate and understand.
- ◆ Practical cases presented by practising experts.
- ◆ State-of-the-art interactive video systems.
- ◆ Teaching supported by telepractice.
- ◆ Continuous updating and recycling systems.
- ◆ Autonomous learning: full compatibility with other occupations
- ◆ Practical exercises for self-evaluation and learning verification.
- ◆ Support groups and educational synergies: questions to the expert, debate and knowledge.
- ◆ Communication with the teacher and individual reflection work.
- ◆ Content that is accessible from any fixed or portable device with an Internet connection
- ◆ Supplementary documentation databases are permanently available, even after the program



*As the course is online, you will be able to train wherever and whenever you want, balancing your professional and personal life”*

“

*You will have access to the most advanced didactic resources and the most innovative knowledge in a program that stands out for the quality of its contents and its excellent teaching staff”*

Our teaching staff is made up of professionals from different fields related to this specialty. In this way, we ensure that we provide you with the training update we are aiming for. A multidisciplinary team of professionals train and experience in different environments, who will develop the theoretical knowledge in an efficient way, but above all, they will bring their practical knowledge from their own experience to the program: one of the differential qualities of this training.

This mastery of the subject is complemented by the effectiveness of the methodological design of this Postgraduate Certificate in Cardiac Ultrasound in Small Animals. Developed by a multidisciplinary team of e-learning experts, it integrates the latest advances in educational technology. In this way, you will be able to study with a range of easy-to-use and versatile multimedia tools that will give you the necessary skills you need for your specialization.

The design of this program is based on Problem-Based Learning: an approach that conceives learning as a highly practical process. To achieve this remotely, we will use telepractice: with the help of an innovative interactive video system, and learning from an expert, you will be able to acquire the knowledge as if you were actually dealing with the scenario you are learning about. A concept that will allow you to integrate and fix learning in a more realistic and permanent way.

*Specialize in Cardiac Ultrasound in Small Animals with the direct help of renowned professionals. A booming sector due to the growing demand for exotic pets*

*The most effective resources in online teaching, in a practical, comfortable and high-impact course*



# 02 Objectives

Our objective is to train highly qualified professionals for the working A goal that you will reach in just a few months and that will allow you to achieve professional excellence.





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*Open new doors in your professional development with this effective specialist program”*



## General Objectives

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### Module 1

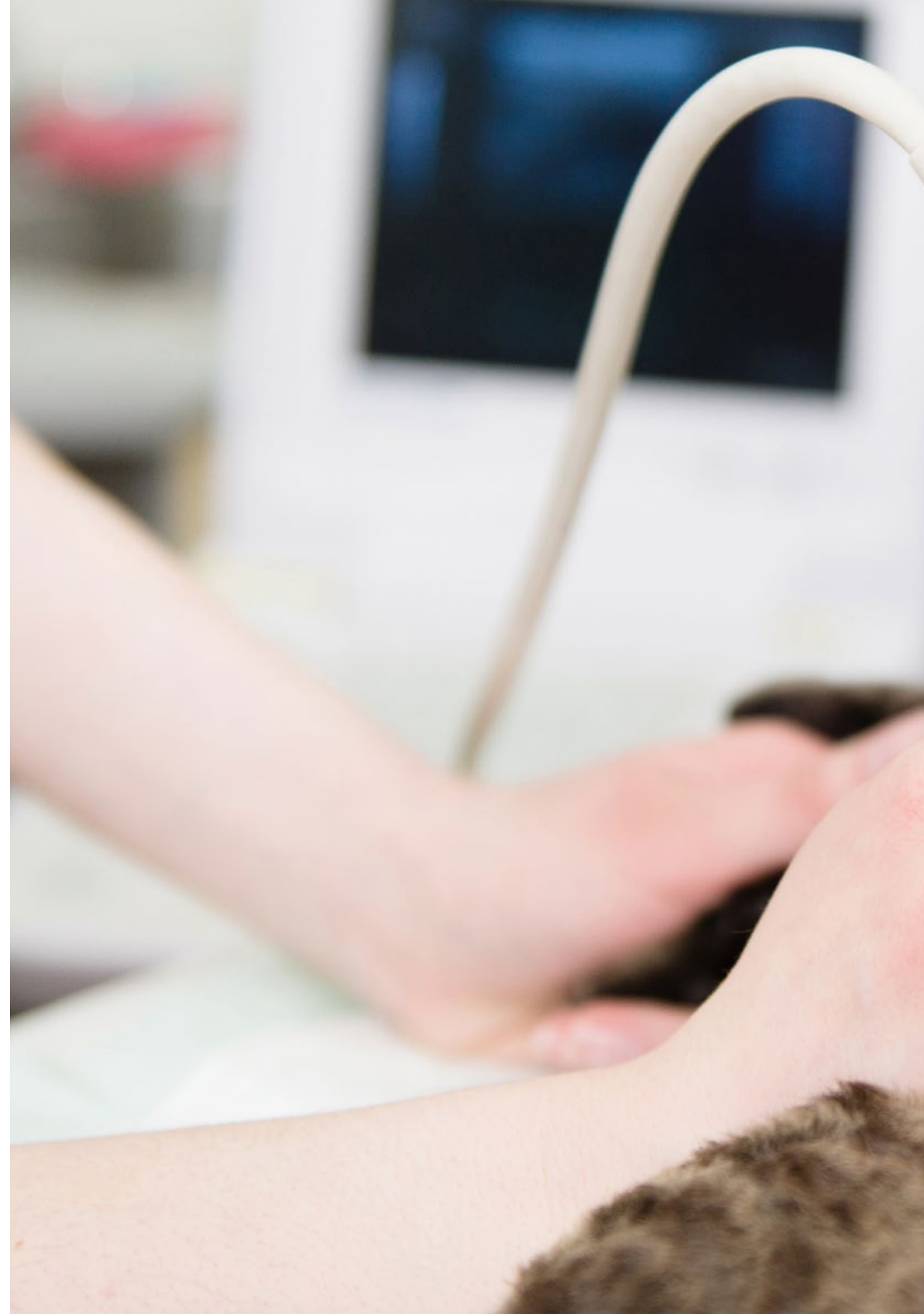
- Develop a comprehensive echocardiographic examination protocol
- Build confidence for conducting different echocardiographic cuts
- Optimizing the image to achieve a correct and accurate examination
- Determine the different echocardiographic measures applied in veterinary cardiology.

### Module 2

- Have the ability to interpret echocardiographic images of the most common diseases
- Effectively assess each disease and be able to stage it
- Differentiate between the different diseases that can be detected by echocardiography



*This specialization course will provide you with the necessary personal and professional skills to use ultrasound scanners correctly”*





## Specific Objectives

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### Module 1

- ◆ Determine ultrasound equipment requirements for echocardiographic studies
- ◆ Establish the different physical principles that generate echocardiographic images
- ◆ Work on the different types of images used in echocardiography
- ◆ Provide key criteria for implementing the Doppler mode in echocardiography
- ◆ Assess the size of the cardiac chambers using echocardiography
- ◆ Assess systolic and diastolic function using echocardiography
- ◆ Determine which organs or cavities can be evaluated by ultrasound-guided cytology.

### Module 2

- ◆ Assess and study valvular heart disease
- ◆ Identify echocardiographic signs for detecting pulmonary hypertension
- ◆ Be able to differentiate between and diagnose canine and feline cardiomyopathies
- ◆ Evaluate the pericardial cavity, as well as the layers that form the pericardium
- ◆ Detect the different cardiac neoplasms
- ◆ Establish the theoretical bases for pericardiocentesis
- ◆ Study the different congenital conditions that can be found in small animals
- ◆ Assess for cardiac parasites
- ◆ Develop advanced echocardiography techniques

03

# Course Management

We provide you with an elite teaching team made up of professionals with extensive experience in the sector. Professionals from different areas and fields of expertise that make up a complete, multidisciplinary team. A unique opportunity to learn from the best.





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*We have a team of highly qualified teachers so that you can specialize with the best"*

## Management



### Dr. Conde Torrente, María Isabel

- ♦ Head of the Diagnostic Imaging and Cardiology Service at Hospital Veterinario Alcor. Currently
- ♦ Degree in Veterinary Medicine from the University of Santiago de Compostela in 2012 with a certified European degree
- ♦ Advanced Postgraduate Course in Diagnostic Imaging (Computerized Axial Tomography). General Practitioner Advanced Certificate TCESMD. 2019
- ♦ Postgraduate General Practitioner Certificate in Diagnostic Imaging (GPCert- DI) 2016
- ♦ Professor in Veterinary Practical Training in 2015 as a teacher for the official qualification of veterinary technical assistant
- ♦ Gives training courses on clinical and laboratory analysis for veterinarians at Hospital Veterinario Alberto Alcocer
- ♦ Medical Director and head of the Advanced Diagnostic Imaging Service at Grupo Peñagrande. Exclusive handling of TC General Electrics TriAc Revolution 16 cuts. (2017-2019)
- ♦ Head of the Diagnostic Imaging Service at Centro Veterinario Mejorada. (2016-2017)
- ♦ Responsible for diagnostic services at Hospital Veterinario Alberto Alcocer. (2013-2016)
- ♦ University of Santiago de Compostela. Department of Animal Pathology. Collaboration with the research group on heavy metal accumulation in bovine meat in collaboration with Cornell University, New York; published in the Journal of Animal Science.



## Professors

### Dr. Monge Utrilla, Óscar

- ♦ Cardiology, Diagnostic Imaging and Endoscopy, KITICAN Group, Madrid (currently)
- ♦ Degree in Veterinary Medicine, Universidad Complutense de Madrid 2017
- ♦ Degree Course "Specialist Course in Veterinary Hospital Clinic", University of León 2018
- ♦ Professional Master's Degree "Veterinary Anesthesiology", TECH - Technological University. 2021
- ♦ In-house training in cardiology and respiratory medicine at Grupo Veterinario Kitican
- ♦ Veterinary Intern/Resident at the Veterinary Hospital of the University of León Faculty of Veterinary Medicine 2018
- ♦ Veterinarian at the Emergency Department and in charge of the Cardiology Department at El Retiro Veterinary Hospital 2018
- ♦ Veterinarian at the Emergency Department and the Cardiology Department at Majadahonda Veterinary Hospital 2019
- ♦ Cardiology, Ultrasound and Outpatient Endoscopy for Coromoto Diagnostic Imaging, Sinergia 2020

### Dr. García Guerrero, Francisco

- ♦ Veterinarian at Ecopet (Ultrasound Service/Outpatient Cardiology) (2013-present)
- ♦ Degree in Veterinary Medicine from the University of Cordoba in 2003
- ♦ Experience at the Diagnostic Imaging and Cardiology Service at the University of Murcia. (March 2012-June 2012)
- ♦ Stay at the Diagnostic Imaging and Internal Medicine Department of Hospital Clínico UAB (May 2014 – August 2014)
- ♦ Abdominal Ultrasound Course for Trauvel In May 2018
- ♦ Several Private Training Courses at Veterinary Centers/Hospitals
- ♦ Veterinarian at Clínica Veterinaria García Vallejo (Seville) (2003-2016)

04

# Structure and Content

A complete and well-structured program, designed by renowned professionals in the field who will take you to the highest standards of quality and success using ultrasound in your daily practice.





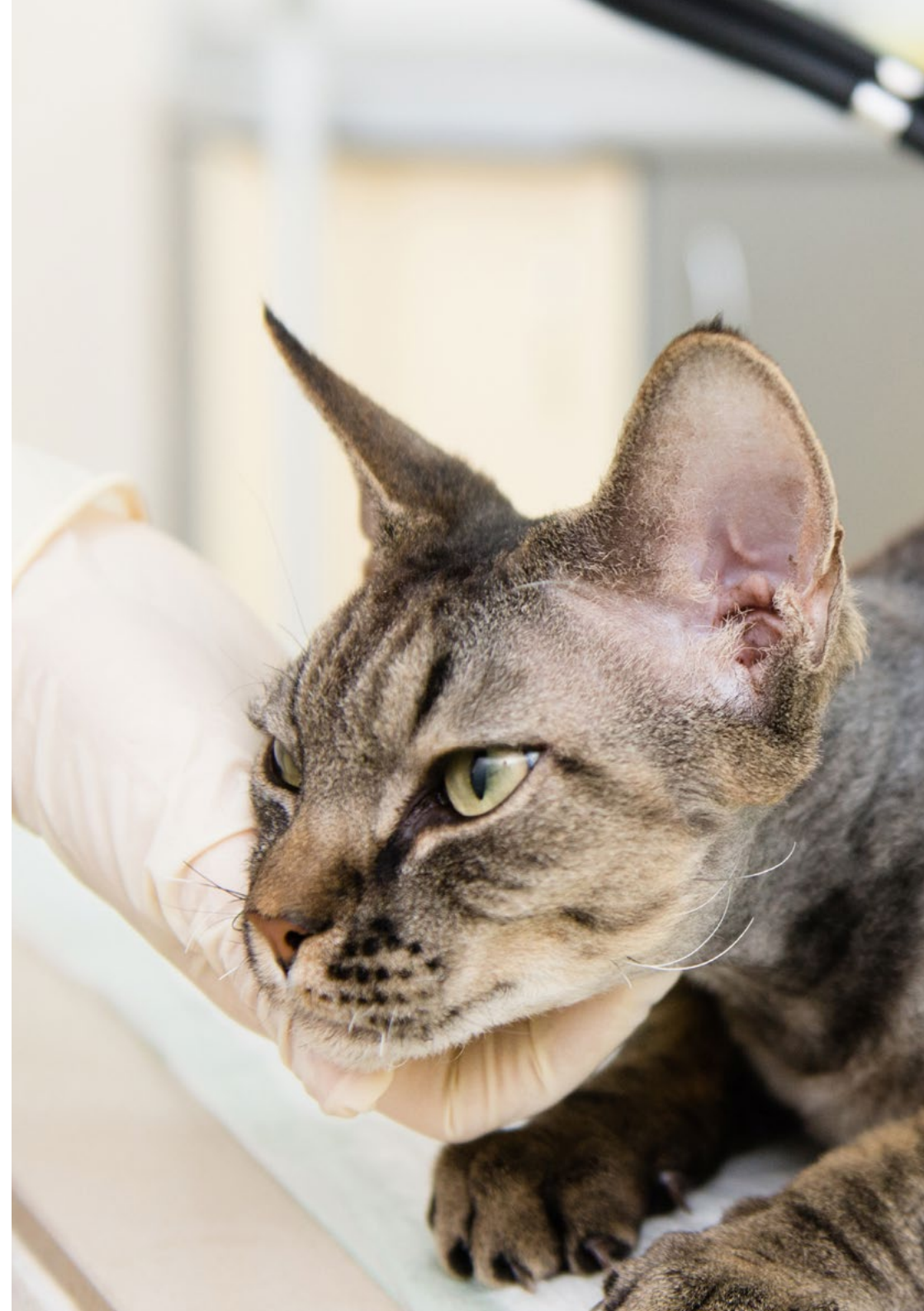


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*An excellently complemented program that will allow you to specialize in a short time”*

**Module 1. Echocardiography I. Echocardiographic Examination. Examination Methods Application to Cardiology**

- 1.1. Echocardiography
  - 1.1.1. Equipment and Probes
  - 1.1.2. Patient Positioning
  - 1.1.3. Echocardiographic Examination Methods
- 1.2. Keys to Carrying Out an Optimal Echocardiographic Study
  - 1.2.1. How to Optimize the Performance of my Ultrasound Equipment
  - 1.2.2. Factors affecting the quality of an Echocardiographic Study
  - 1.2.3. Artifacts in Echocardiography
- 1.3. Echocardiographic Slicing
  - 1.3.1. Right Side Parasternal Cuts
  - 1.3.2. Left Side Parasternal Cuts
  - 1.3.3. Subcostal Cuts
- 1.4. M Mode Echocardiographic Examination
  - 1.4.1. How to Optimize the Image in M Mode
  - 1.4.2. M Mode Applied to the Left Ventricle
  - 1.4.3. M Mode Applied Mitral Valve
  - 1.4.4. M Mode Applied Aortic Valve
- 1.5. Color and Spectral Doppler Echocardiographic Examinations
  - 1.5.1. Physical Principles of Color Dopplers
  - 1.5.2. Physical Principles of Spectral Dopplers
  - 1.5.3. Color Doppler Imaging
  - 1.5.4. Pulsed Doppler Imaging Importance of Continuous Dopplers in Echocardiography
  - 1.5.5. Tissue Doppler
- 1.6. Echocardiographic Examination of the Aortic and Pulmonary Valves
  - 1.6.1. Color Doppler Mode at Aortic Valve
  - 1.6.2. Color Doppler Mode at Lung Valve
  - 1.6.3. Spectral Doppler Mode at Aortic Valve
  - 1.6.4. Spectral Doppler Mode at Lung Valve





- 1.7. Echocardiographic Examination of Mitral/Tricuspid Valves and Pulmonary Veins
  - 1.7.1. Color Doppler Mode at Mitral and Tricuspid Valves
  - 1.7.2. Spectral Doppler Mode at Mitral and Tricuspid Valves
  - 1.7.3. Spectral Doppler Mode at Pulmonary Veins
- 1.8. Assessment of Systolic and Diastolic Function Using Echocardiography
  - 1.8.1. Determination of Systolic Function in 2D Mode
  - 1.8.2. Determination of Systolic Function in M Mode
  - 1.8.3. Determination of Systolic Function in Spectral Doppler Mode
- 1.9. Assessment of Systolic and Diastolic Function Using Echocardiography
  - 1.9.1. Determination of Diastolic Function in 2D Mode
  - 1.9.2. Determination of Diastolic Function in M Mode
  - 1.9.3. Determination of Diastolic Function in Spectral Doppler Mode
- 1.10. Echocardiographic Examination to Assess Hemodynamics Application in Cardiology
  - 1.10.1. Pressure Gradients
  - 1.10.2. Systolic Pressure
  - 1.10.2. Diastolic Pressure

## Module 2. Echocardiography II Assessment of Main Cardiac Diseases

- 2.1. Valvular Diseases
  - 2.1.1. Chronic Mitral Valve Degeneration
  - 2.1.2. Chronic Tricuspid Valve Degeneration
  - 2.1.3. Atrioventricular Valve Stenosis
  - 2.1.4. Semilunar Valve Abnormalities
- 2.2. Pulmonary Hypertension
  - 2.2.1. Echocardiographic Signs of Pulmonary Hypertension: B Mode
  - 2.2.2. Echocardiographic Signs of Pulmonary Hypertension: M Mode
  - 2.2.3. Echocardiographic Signs of Pulmonary Hypertension: Doppler
  - 2.2.4. Causes and Differentiation of Types of Pulmonary Hypertension
- 2.3. Myocardial Diseases
  - 2.3.1. Canine Dilated Cardiomyopathy
  - 2.3.2. Arrhythmogenic Right Ventricular Cardiomyopathy
  - 2.3.3. Myocarditis

- 2.4. Feline Cardiomyopathies
  - 2.4.1. Hypertrophic Cardiomyopathy
  - 2.4.2. Restrictive Cardiomyopathy
  - 2.4.3. Feline Dilated Cardiomyopathy
  - 2.4.4. Arrhythmogenic Cardiomyopathy
  - 2.4.5. Unclassified Cardiomyopathies
- 2.5. Pericardium and Pericardiocentesis
  - 2.5.1. Idiopathic Pericarditis
  - 2.5.2. Constrictive Pericarditis
  - 2.5.3. Other Pericardial Diseases
  - 2.5.4. Pericardiocentesis
  - 2.5.5. Pericardiectomy.
- 2.6. Cardiac Neoplasms
  - 2.6.1. Hemangiosarcoma
  - 2.6.2. Cardiac-based Tumors
  - 2.6.3. Lymphoma
  - 2.6.4. Mesothelioma
  - 2.6.5. Others
- 2.7. Congenital Heart Diseases I
  - 2.7.1. Patent Ductus Arteriosus
  - 2.7.2. Pulmonary Stenosis.
  - 2.7.3. Subaortic Stenosis
  - 2.7.4. Interventricular and Interatrial Defects
  - 2.7.5. Valvular Dysplasia





- 2.8. Congenital Heart Diseases II
  - 2.8.1. Interventricular and Interatrial Defects
  - 2.8.2. Valvular Dysplasia
  - 2.8.3. Tetralogy of Fallot
  - 2.8.4. Others
- 2.9. Dirofilariasis and Other Cardiopulmonary Worms
  - 2.9.1. Canine and Feline Dirofilariasis
  - 2.9.2. Canine Angiostrongylosis
  - 2.9.3. Complementary Tests
- 2.10. Transesophageal Echocardiography and 3D Echocardiography
  - 2.10.1. Transesophageal Echocardiogram: Basics
  - 2.10.2. Transesophageal Echocardiogram: Indications
  - 2.10.3. 3D Echocardiogram: Basics
  - 2.10.4. 3D Echocardiogram: Indications

“ *This Postgraduate Certificate in Cardiac Ultrasound in Small Animals will take you through different teaching approaches which will allow you to learn in a dynamic and efficient way*”

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.





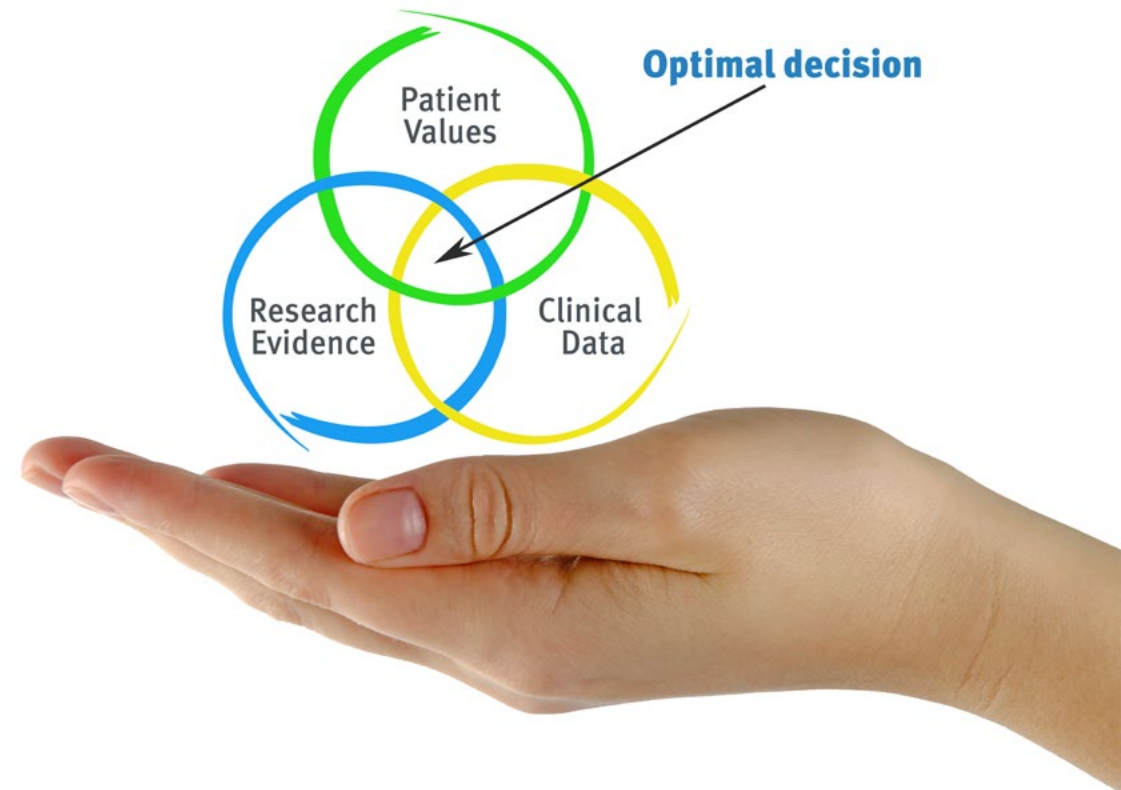
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*Successfully complete this training program and receive your university certificate without travel or laborious paperwork"*

## 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. Specialists learn better, faster, and more sustainably over time.

*With TECH you 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 be based on current professional life, trying to recreate the real conditions in the 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 achieve the assimilation of concepts, but also a development of their mental capacity through exercises to evaluate real situations and the application of knowledge.
2. The learning process has a clear focus on 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.



## 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.



*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 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 65,000 veterinarians with unprecedented success, in all clinical specialties regardless of the surgical load. 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 the teaching materials are specifically created for the course by specialists who teach on the course so that the teaching content is highly 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.



### Latest Techniques and Procedures on Video

We bring you closer to the latest Techniques, to the latest Educational Advances, to the forefront of current Veterinary Techniques and Procedures. 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

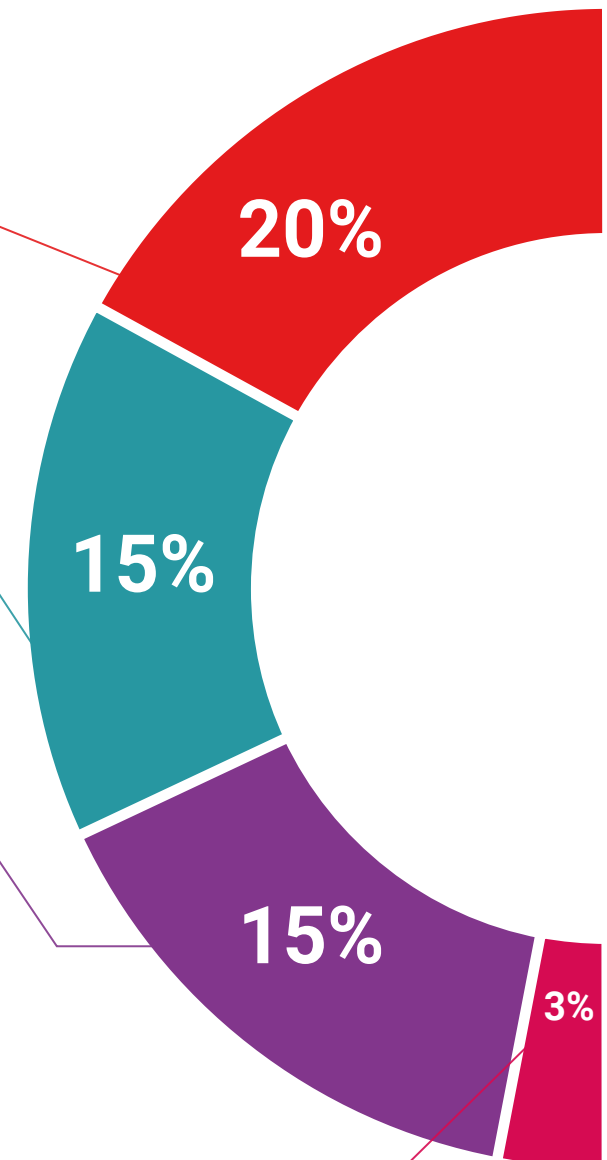
We present the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

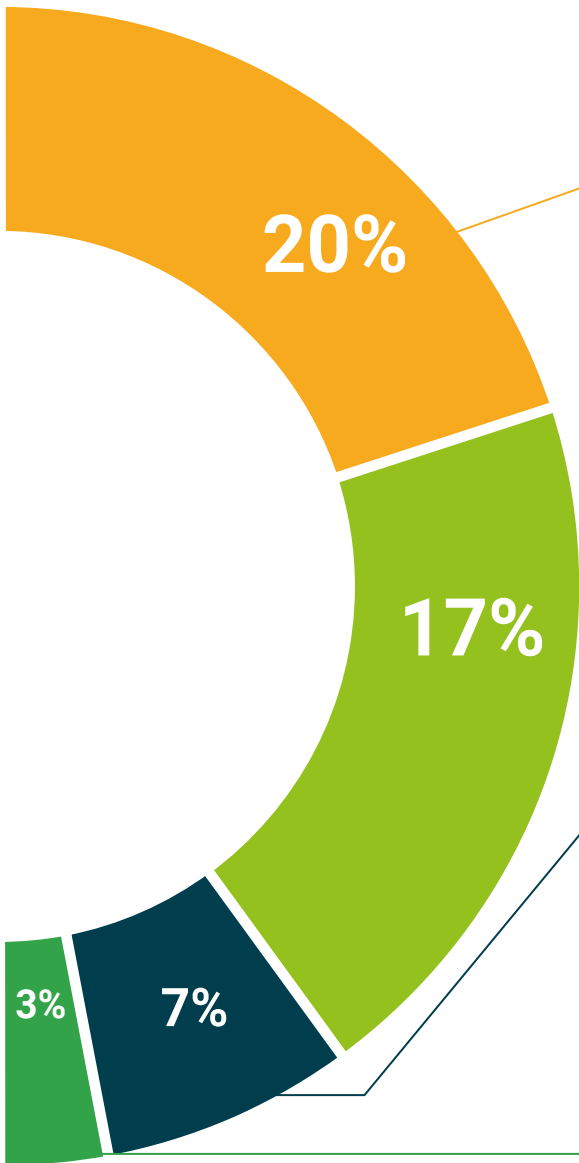
This unique multimedia content presentation training system was awarded by Microsoft as a "European Success Story".



### 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

The Postgraduate Certificate in Cardiac Ultrasound in Small Animals guarantees you, in addition to the most rigorous and up-to-date training, access to a Postgraduate Certificate issued by TECH Technological University.



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*Successfully complete this training program  
and receive your university certificate without  
travel or laborious paperwork”*

This **Postgraduate Certificate in Cardiac Ultrasound in Small Animals** contains the most complete and up-to-date scientific program on the market.

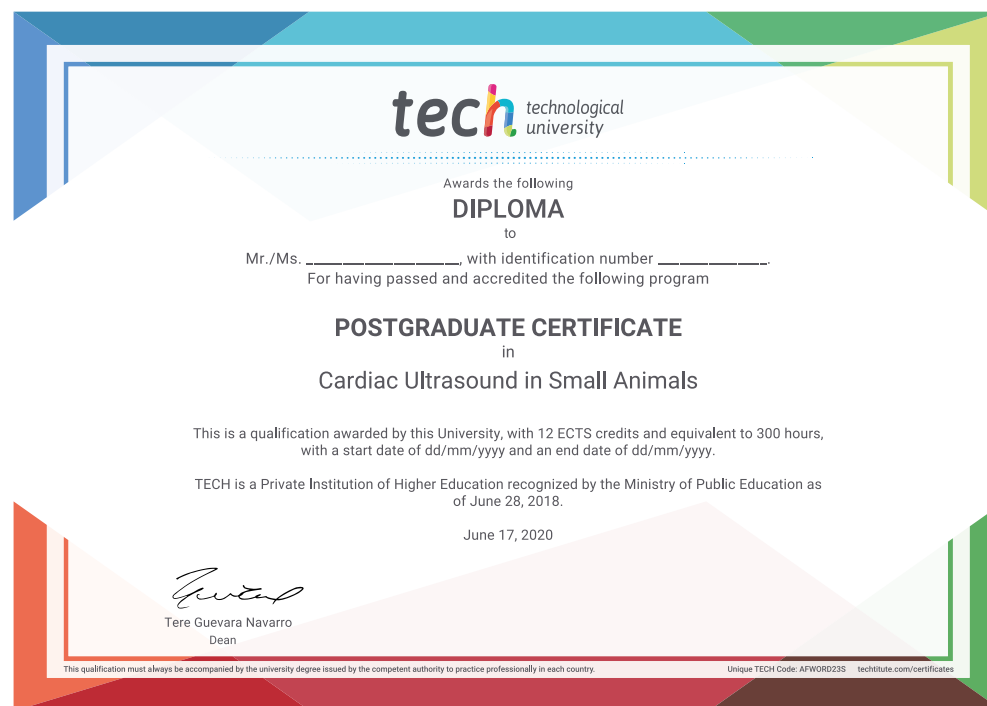
After passing the evaluations, the student will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery\*.

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

Title: **Postgraduate Certificate in Cardiac Ultrasound in Small Animals**

ECTS: **12**

Official Number of Hours: **300 hours**



\*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 quality  
development languages  
classroom



**Postgraduate Certificate**  
Cardiac Ultrasound  
in Small Animals

Course Modality: Online

Duration: 2 months.

Certificate: TECH - Technological University

12 ECTS Credits

Teaching Hours: 300 hours

# Postgraduate Certificate Cardiac Ultrasound in Small Animals

