

# Postgraduate Certificate

## Ultrasound Diagnosis in Small Animals





## Postgraduate Certificate Ultrasound Diagnosis in Small Animals

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

Website: [www.techtute.com/pk/veterinary-medicine/postgraduate-certificate/ultrasound-diagnosis-small-animals](http://www.techtute.com/pk/veterinary-medicine/postgraduate-certificate/ultrasound-diagnosis-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. 20*

06

Certificate

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*p. 28*

# 01

# Introduction

Ultrasound is one of the most-used imaging techniques in veterinary clinic practice. It is a harmless, simple and useful method in the diagnosis of many pathologies, both in internal medicine and surgery.

With this complete update, you will specialize in ultrasound diagnostics under the guidance of industry professionals with extensive experience in the field.







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*A unique opportunity to specialize  
in a high-demand sector and stand  
out professionally from the rest”*

Ultrasound has many advantages over radiology, although in no case is ultrasound a substitute for radiology. With it we can assess the parenchyma, wall thickness and content of many organs, which in other imaging techniques is limited.

This program goes deep into how an ultrasound scanner works, understanding the different principles and artifacts that are produced from the basis of physics, in order to understand what we visualize in an image and how we can obtain it. Furthermore, we will study the different types of probes, their functionality and the ways in which we can use them in an ultrasound. The Doppler technique will allow to understand the study of blood flow, its speed and direction. Finally, we will explain how to use some diagnostic methods with contrast ultrasound.

It will also show how to position the patient so that the image can be better visualized in the different techniques so that the animal feels at ease and the diagnosis can be made in the simplest and most effective way.

A better understanding of the technique will allow us to identify when to perform an ultrasound in order to help the professional in the diagnosis of the patient, its follow-up and, on the other hand, to reduce the need to perform an ultrasound in unnecessary cases.

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 this is an online course, you are not conditioned by fixed schedules, nor do you need to move to another physical 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 Ultrasound Diagnosis in Small Animals** contains the most complete and up-to-date scientific program in the market. Its most notable features are:

- ♦ The latest technology in online teaching software
- ♦ A 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 forums
- ♦ 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



*This specialization of the highest educational quality will allow you to face the daily challenges that may arise in Ultrasound Diagnosis in Small Animal"*

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*You will have access to didactic materials and real cases from experts, which will allow you to apply the latest techniques and knowledge in ultrasound diagnosis”*

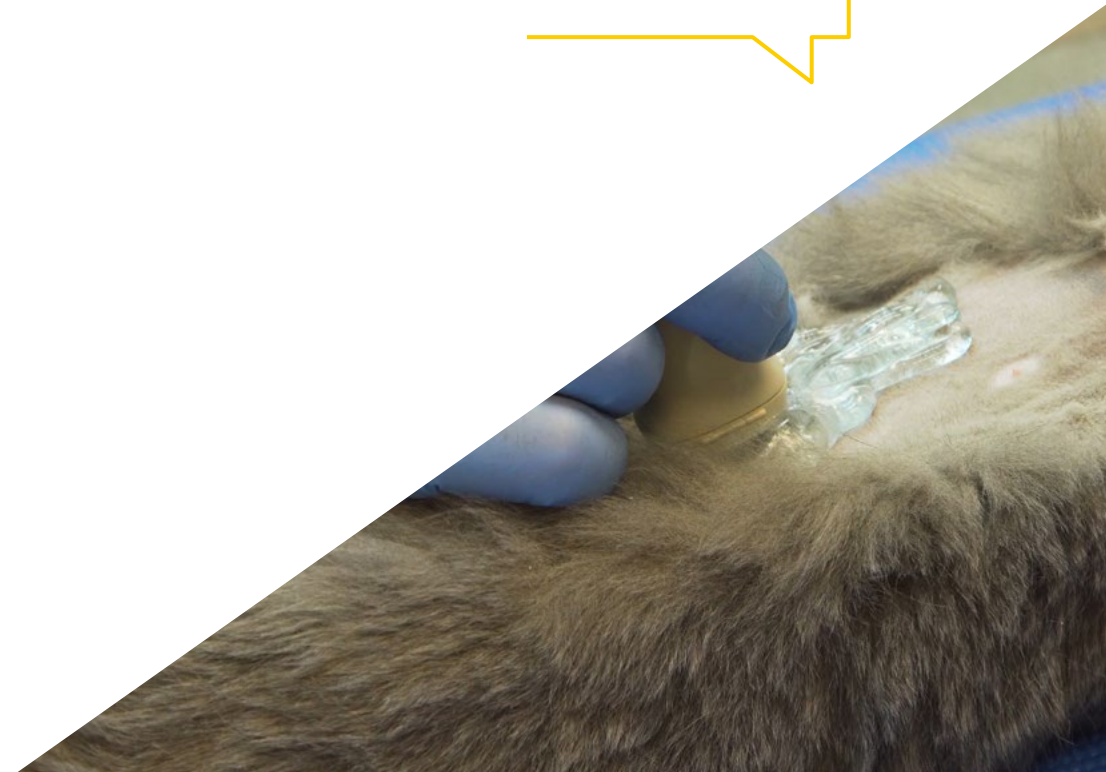
Our teaching staff is made up of professionals from different fields related to this specialty. In this way TECH ensures that it delivers the educational up-to-date objectives that it aims for. A multidisciplinary team of trained and experienced professionals in different environments, who will develop the theoretical knowledge in an efficient way, but above all, they offer the program the practical knowledge derived from their own experience: one of the distinguishing qualities of this specialization.

This mastery of the subject is complemented by the effectiveness of the methodological design of this Postgraduate Certificate in Ultrasound Diagnosis in Small Animals. Developed by a multidisciplinary team of E-Learning experts, it integrates the latest advances in educational technology. In this way, the student will be able to study with a range of comfortable and versatile multimedia tools that will give him the operability he needs in his training.

The design of this program is based on Problem-Based Learning: an approach that views 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, students will be able to acquire knowledge as if they were facing the case they are learning at that moment. A concept that will allow students to integrate and memorize what they have learnt in a more realistic and permanent way.

*Acquire the bases and tools necessary for the correct ultrasound diagnosis and stand out as a successful professional in a rapidly growing sector.*

*A unique specialization that stands out thanks to the quality of its contents and its excellent teaching staff, made up of professionals with years of experience.*



# 02 Objectives

This intensive program is aimed at facilitating the work of professionals in their daily practice with the use of ultrasounds and ultrasound diagnosis. A unique opportunity to advance in your career and reach professional success.





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*This program is designed to update your knowledge in ultrasound diagnosis, using the latest educational technology to enable you to contribute with quality and safety to decision making in this new field"*



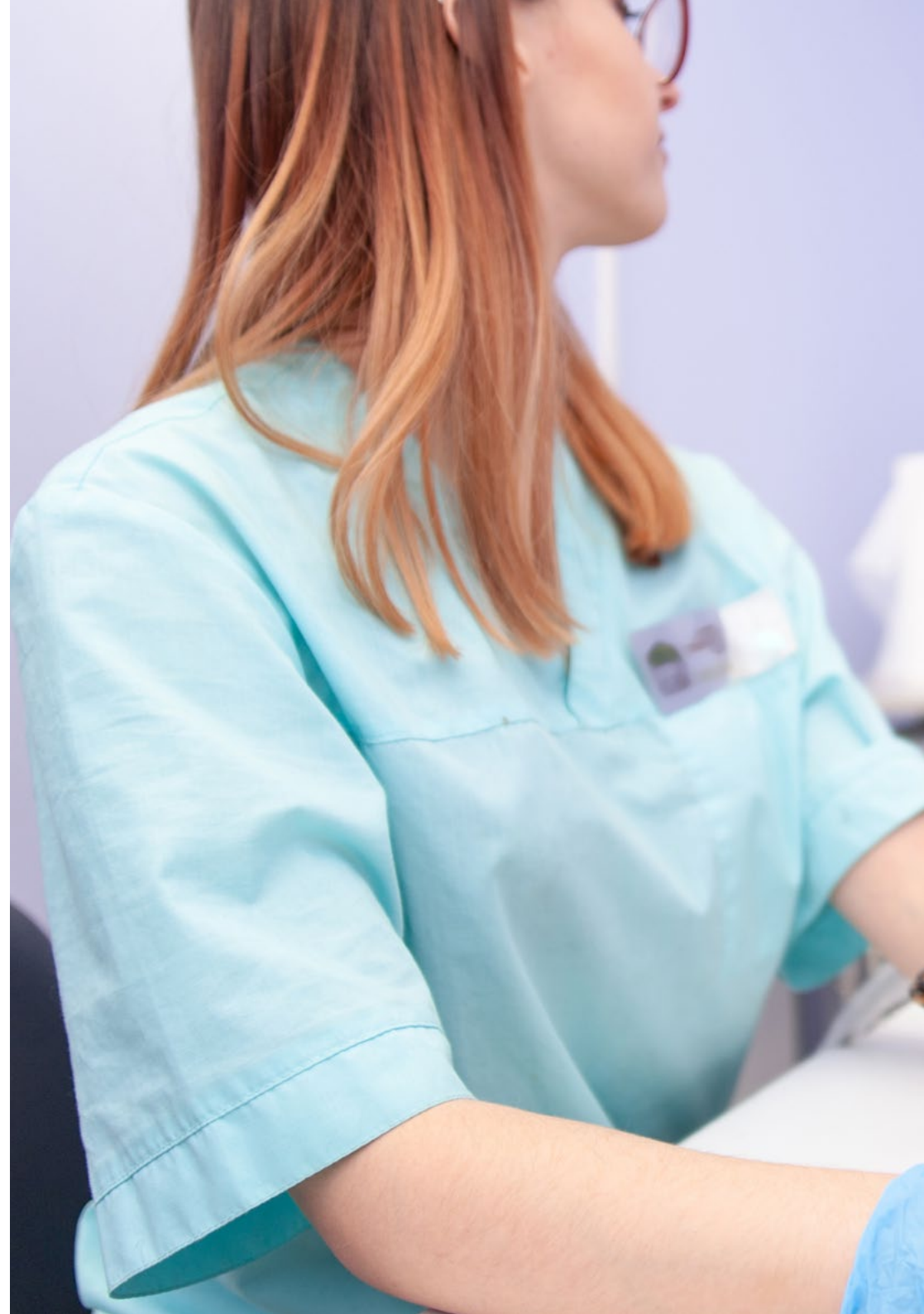
## General Objectives

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- Introduce the physical principles of an ultrasound scanner, as well as its basic operation in order to understand what we visualize in an ultrasound image and how to obtain it
- Study the different types of probe, their classification and purpose
- Determine the different ways in which an ultrasound scanner can be used
- Propose an adequate positioning of the patient for an ultrasound examination



*This program will help you acquire the skills you need to excel in your daily work"*





## Specific Objectives

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- ◆ Establish the fundamentals of ultrasound physics and how a scan is performed with image formation
- ◆ Determine the different ultrasound artifacts so as to avoid misinterpretation
- ◆ Identify the basic operation system of an ultrasound scanner in order to make the best use of it
- ◆ Establish the different types of probe and their function
- ◆ List the different uses for which an ultrasound scanner can be used
- ◆ Propose a system for preparing patients before an ultrasound examination



03

# Course Management

Professionals from different areas and competencies, with extensive experience in animal ultrasound, will be your tutors throughout this specialization. A complete multidisciplinary team that stands out for its illustrious professional trajectory and teaching experience.







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

## Management



### Ms. Conde Torrente, María Isabel

- Head of the Diagnostic Imaging and Cardiology Service at Alcor Veterinary Hospital. 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). TCESMD. 2019
- Postgraduate degree 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 of 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



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*With this high-level program,  
you will study with the best. A  
unique opportunity to achieve  
professional excellence”*



# 04

## Structure and Content

The contents of this Postgraduate Certificate have been developed by the different specialists of this program with a clear purpose: to ensure that the students acquire each and every one of the necessary skills to become true experts in this field.

A very complete and well-structured program that will lead students to the highest standards of quality and success.







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

## Module 1. Ultrasound Diagnosis

- 1.1. The Ultrasound Scanner
  - 1.1.1. Frequency (F)
  - 1.1.2. Depth
  - 1.1.3. Acoustic Impedance
  - 1.1.4. Physical Phenomena
    - 1.1.4.1. Reflection
    - 1.1.4.2. Refraction:
    - 1.1.4.3. Absorption
    - 1.1.4.4. Dispersion
    - 1.1.4.5. Attenuation
  - 1.1.5. Transduction and Transducer
- 1.2. Operation of an Ultrasound Scanner
  - 1.2.1. Patient Selection and Data Entry
  - 1.2.2. Types of Exam (Presets)
  - 1.2.3. Transducer Position
  - 1.2.4. Freeze, Save, or Pause Image
  - 1.2.5. Cine Loop
  - 1.2.6. Image Mode Selection
  - 1.2.7. Depth
  - 1.2.8. Zoom
  - 1.2.9. Focus
  - 1.2.10. Gain
  - 1.2.11. Frequency (F)
  - 1.2.12. Sector Size
- 1.3. Types of Probe
  - 1.3.1. Sectorial
  - 1.3.2. Lineal
  - 1.3.3. Microconvex
- 1.4. Ultrasound Modes
  - 1.4.1. M-Mode
  - 1.4.2. Two-dimensional Mode
  - 1.4.3. Transesophageal Echocardiogram



- 1.5. Doppler Ultrasound
  - 1.5.1. Physical Principles
  - 1.5.2. Indications
  - 1.5.3. Types
    - 1.5.3.1. Spectral Doppler
    - 1.5.3.2. Pulsed Doppler
    - 1.5.3.3. Continuous Doppler
- 1.6. Harmonic and Contrast Ultrasound
  - 1.6.1. Harmonic Ultrasound
  - 1.6.2. Contrast Ultrasound
  - 1.6.3. Utilities
- 1.7. Patient Preparation
  - 1.7.1. Prior Preparation
  - 1.7.2. Positioning
  - 1.7.3. Sedation?
- 1.8. Ultrasounds on the Patient
  - 1.8.1. How Do Ultrasound Waves Behave When Passing Through Tissue?
  - 1.8.2. What Can We See in the Image?
  - 1.8.3. Echogenicity
- 1.9. Image Orientation and Expression
  - 1.9.1. Orientation
  - 1.9.2. Terminology
  - 1.9.3. Examples:
- 1.10. Artefacts
  - 1.10.1. Reverberation
  - 1.10.2. Acoustic Shadow
  - 1.10.3. Lateral Shadow
  - 1.10.4. Posterior Acoustic Enhancement
  - 1.10.5. Margin Effect
  - 1.10.6. Mirror or Specular Image
  - 1.10.7. Scintillation Artefact
  - 1.10.8. Aliasing



*This Postgraduate Certificate in Ultrasound Diagnosis 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 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.







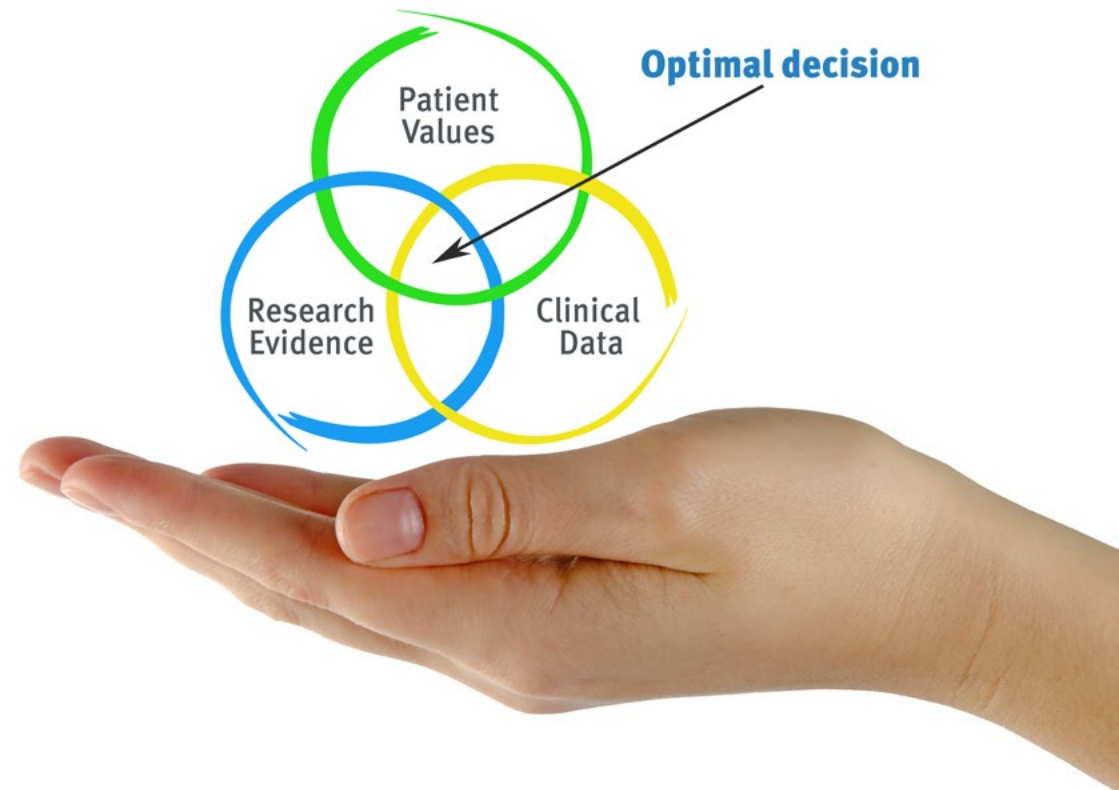
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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## 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 Ultrasound Diagnosis in Small Animals 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 degree  
without travel or laborious paperwork”*

This **Postgraduate Certificate in Ultrasound Diagnosis in Small Animals** contains the most complete and up-to-date scientific program in 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 Ultrasound Diagnosis in Small Animals**

Official N° of hours: **150 h.**



\*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.



future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present quality

online training

development languages

virtual classroom

**tech** technological  
university

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