

# Postgraduate Certificate Complementary Diagnostic Procedures in Large Animals





## Postgraduate Certificate Complementary Diagnostic Procedures in Large Animals

- » Modality: online
- » Duration: 12 weeks
- » Certificate: TECH Global University
- » Credits: 12 ECTS
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtute.com/us/veterinary-medicine/postgraduate-certificate/complementary-diagnostic-procedures-large-animals](http://www.techtute.com/us/veterinary-medicine/postgraduate-certificate/complementary-diagnostic-procedures-large-animals)

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# 01

# Introduction

Cardiology in Veterinary Medicine has advanced significantly in recent years. Complex diagnostic and therapeutic techniques available in other species and, of course, in humans, such as cardiac catheterization and minimally invasive surgery, are notoriously complex and require a high level of expertise to perform.

Echocardiography and electrocardiography are the two most commonly used diagnostic techniques in the examination of animals with cardiovascular disorders and are usually essential in the approach to cardiovascular pathology.

This program specializes veterinarians in the Complementary Diagnostic Procedures in Large Animals so that they can obtain the maximum amount of information about the conduction of the cardiac rhythm.





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*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.

The Postgraduate Certificate in Complementary Diagnostic Procedures 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 Complementary Diagnostic Procedures 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 Diagnostic Procedures Complementary 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
- ♦ New developments in Complementary Diagnostic Procedures in Large Animals
- ♦ Practical exercises where self-assessment can be used to improve learning.
- ♦ Special emphasis on innovative methodologies in Complementary Diagnostic Procedures 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



*This Postgraduate Certificate is the best investment you can make when choosing a refresher program to update your existing knowledge of Veterinary Cardiology"*

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

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

*This 100% online program 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 Complementary Diagnostic Procedures in Large Animals.



# 02 Objectives

The Postgraduate Certificate in Complementary Diagnostic Procedures in Large Animals is designed to enhance the performance of veterinary professionals with the latest advances and the most innovative treatments in the sector.







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*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

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- ♦ Develop a suitable working methodology to optimize the use of non-invasive diagnostic tests
- ♦ Analyze the basics of ultrasound to learn the tools useful in the assessment of cardiac function and structure
- ♦ Establish solid concepts in the genesis of the electrocardiogram
- ♦ Develop a diagnostic protocol based on the electrocardiogram.
- ♦ Generate specialized knowledge in advanced cardiac diagnostic and therapeutic techniques
- ♦ Examine the instrumentation required to perform cardiac catheterization and minimally invasive surgery
- ♦ Establish the appropriate methodology for the performance of these advanced procedures, including their anesthetic approach.
- ♦ Strengthen the basis for selecting appropriate cases for cardiac catheterization and minimally invasive surgery
- ♦ Develop cardiopulmonary resuscitation protocols



*An impressive teaching staff, made up of professionals from different areas of expertise, will be your teachers throughout the program: a unique opportunity not to be missed"*





## Specific Objectives

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- ♦ Fundamentals of ultrasound physics and imaging principles
- ♦ Differentiate the types of echocardiography and analyze their utility in different clinical situations
- ♦ Recognize all the ultrasound planes described and propose a standardized protocol for evaluating the heart
- ♦ Gain insight into the genesis of the electrocardiogram in order to analyze its pattern, the existence of artifacts and morphological anomalies
- ♦ Specify the different recording systems and methods used to obtain the electrocardiogram and adapt it to the patient's clinical situation
- ♦ Establish a systematic protocol that simplifies the reading of the electrocardiogram.
- ♦ Identify the main mistakes made when analyzing the electrocardiogram.
- ♦ Analyze the specific risks posed by anesthesia
- ♦ Develop appropriate anesthetic protocols that allow for safe anesthesia
- ♦ Adequately select cases that can undergo cardiac catheterization and minimally invasive surgery, establishing a risk-benefit ratio
- ♦ Develop in-depth knowledge of the instruments used in cardiac catheterization and minimally invasive surgery techniques
- ♦ Differentiate the types of existing pacemakers and defibrillators
- ♦ Integrating electrical cardioversion as a routine treatment option in the equine clinic
- ♦ Examine the complications that arise during cardiac catheterization and minimally invasive surgery procedures and establish protocols for dealing with these complications
- ♦ Establish up-to-date protocols for cardiopulmonary resuscitation in foals and adult horses

# 03

# Course Management

The program's teaching staff includes leading experts in Complementary Diagnostic Procedures in Large Animals who contribute their vast work experience to this academic program. They are world-renowned veterinarians from different countries with proven theoretical and practical professional experience.





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*Our teaching faculty, experts in Complementary Diagnostic Procedures 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

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- 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

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*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

### Dr. Troya Portillo, Lucas

- ♦ Equine Veterinary Surgeon
- ♦ Veterinary Surgeon in private Equine Medicine and Surgery practices
- ♦ Surgeon and Clinical Veterinarian in the Large Animal Department at the Hospital
- ♦ Veterinary Clinician
- ♦ Surgeon in hospitals and horse clinics in Europe
- ♦ Author or co-author of several publications on Equine Surgery
- ♦ Teacher in university and postgraduate studies in various countries
- ♦ Graduate in Veterinary Medicine from the Autonomous University of Barcelona
- ♦ Master of Veterinary Science from the University of Saskatchewan

### Ms. Roquet Carne, Imma

- ♦ 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 University
- ♦ Autonomous of Barcelona
- ♦ Veterinary Researcher with the Institute of Applied Studies
- ♦ Master in Equine Hospital Clinic at the Complutense University of Madrid
- ♦ Graduate in Veterinary Medicine from the Complutense University of Madrid
- ♦ Member of the Spanish Association of Equine Veterinarians





# 04

# Structure and Content

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





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*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 and 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. Advanced Cardiac Procedures: Interventionism, Minimally Invasive Surgery and Cardiopulmonary Resuscitation in Large Animals: Equidae, Ruminants and Swine**

- 2.1. Anesthesia of Patients Undergoing Cardiac Interventional and Minimally Invasive Surgery
  - 2.1.1. Monitoring
  - 2.1.2. General Anesthesia in Non-Critically Ill Patients
  - 2.1.3. General Anesthesia in Critically Ill Patients
  - 2.1.4. Anesthesia for On-Station Procedures
- 2.2. Endomyocardial Biopsy
  - 2.2.1. Instruments
  - 2.2.2. Technique
  - 2.2.3. Indications for Use
  - 2.2.4. Associated Complications
- 2.3. Pacemaker Implantation
  - 2.3.1. Instruments
  - 2.3.2. Technique
  - 2.3.3. Indications for Use
  - 2.3.4. Associated Complications



- 2.4. Septal Occlusion with Amplatzer Devices for Interventricular Communication
  - 2.4.1. Instruments
  - 2.4.2. Technique
  - 2.4.3. Indications for Use
  - 2.4.4. Associated Complications
- 2.5. Septal Occlusion of Aorto-Cardiac Fistulas with Amplatzer Devices
  - 2.5.1. Instruments
  - 2.5.2. Technique
  - 2.5.3. Indications for Use
  - 2.5.4. Associated Complications
- 2.6. Endovenous Electrical Cardioversion
  - 2.6.1. Instruments
  - 2.6.1. Technique
  - 2.6.2. Indications for Use
  - 2.6.3. Associated Complications
- 2.7. Electrophysiological Mapping
  - 2.7.1. Instruments
  - 2.7.2. Technique
  - 2.7.3. Indications for Use
  - 2.7.4. Associated Complications
- 2.8. Ablation of Supraventricular Arrhythmias
  - 2.8.1. Instruments
  - 2.8.2. Technique
  - 2.8.3. Indications for Use
  - 2.8.4. Associated Complications
- 2.9. Pericardiectomy. by Thoracoscopy
  - 2.9.1. Instruments
  - 2.9.2. Technique
  - 2.9.3. Indications for Use
  - 2.9.4. Associated Complications
- 2.10. Cardiopulmonary Resuscitation
  - 2.10.1. In Foals
  - 2.10.2. In Adults

# 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. Gervas, 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 Complementary Diagnostic Procedures in Large Animals guarantees students, in addition to the most rigorous and up-to-date education, access to a certificate issued by TECH Global University.



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

This program will allow you to obtain your **Postgraduate Certificate in Complementary Diagnostic Procedures in Large Animals** endorsed by **TECH Global University**, the world's largest online university.

**TECH Global University** is an official European University publicly recognized by the Government of Andorra ([official bulletin](#)). Andorra is part of the European Higher Education Area (EHEA) since 2003. The EHEA is an initiative promoted by the European Union that aims to organize the international training framework and harmonize the higher education systems of the member countries of this space. The project promotes common values, the implementation of collaborative tools and strengthening its quality assurance mechanisms to enhance collaboration and mobility among students, researchers and academics.

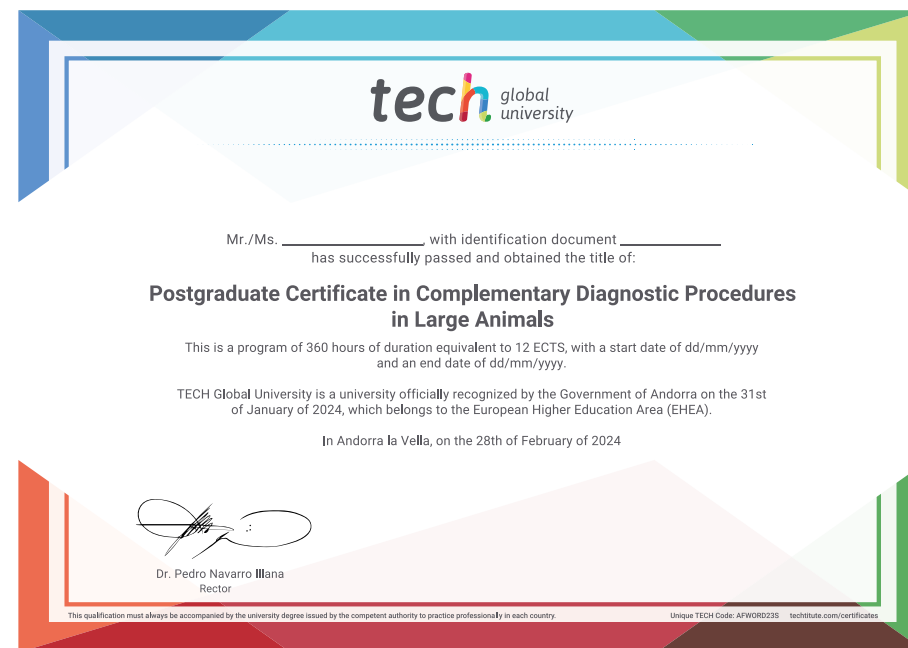
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Complementary Diagnostic Procedures in Large Animals**

Modality: **online**

Duration: **12 weeks**

Accreditation: **12 ECTS**



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



## Postgraduate Certificate Complementary Diagnostic Procedures in Large Animals

- » Modality: online
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- » Certificate: TECH Global University
- » Credits: 12 ECTS
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