

# Postgraduate Diploma

## Systemic Veterinary Pharmacology





## Postgraduate Diploma Systemic Veterinary Pharmacology

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

Website: [www.techtitute.com/us/veterinary-medicine/postgraduate-diploma/postgraduate-diploma-systemic-veterinary-pharmacology](http://www.techtitute.com/us/veterinary-medicine/postgraduate-diploma/postgraduate-diploma-systemic-veterinary-pharmacology)

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01

# Introduction

This course comprises the most complete program of the main pharmacological properties of the groups of drugs capable of modifying body functions, which interfere with the autonomic regulation of these functions. For this purpose, the main pharmacological properties, mechanisms of action, pharmacokinetics, and therapeutic and toxic effects of the groups of drugs that act on the central nervous system and other systems of the animal organism are determined in this education.





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*Specialize in Systemic Veterinary Pharmacology through a revolutionary education, known for its teaching and content quality, and its intensive and flexible approach at the same time"*

Given the large number of functions and organs that are controlled by the autonomic nervous system and the relatively small number of different receptors that mediate cholinergic and adrenergic transmission, it is difficult to ensure that drugs that interfere with these neurotransmitter systems achieve the necessary selectivity (absence of side effects) to be able to make broad therapeutic use of them.

However, many of them are valuable tools in pharmacological research that have found some clinical utility by acting in three ways: by modifying the availability of the transmitter in the extracellular space, by acting on the presynaptic element (preganglionic or postganglionic nerve fibers) and by acting at the postsynaptic level (soma of the postganglionic neuron or effector cell).

It establishes the drugs used for the treatment of a wide variety of neurological and psychiatric diseases, analgesics, among other symptoms.

Due to their complexity, the mechanisms by which various drugs act on the Central Nervous System are not always well understood. These drugs with effects on the Central Nervous System act on specific receptors that regulate synaptic transmission.

This Postgraduate Diploma examines the main pharmacological properties (mechanism of action, pharmacokinetics, and therapeutic and toxic effects) of groups of drugs that act on the cardiovascular, respiratory, renal and blood systems.

Classifies the different drugs that act at the vascular level, such as coagulation modifiers and cardiac drugs.

It examines the different drugs that act as respiratory stimulants, bronchodilators, expectorants and antitussives.

It deals with the pharmacology of the digestive system, both at the level of secretion and motility, laxative and antidiarrheal drugs, as well as pharmacology of vomiting.

It offers specialized knowledge on the different drugs that act on the motility of the stomach and its secretions, as well as drugs that act on gastric pH, on the intestinal tract and on rumen-reticulum motility.

This **Postgraduate Diploma in Systemic Veterinary Pharmacology** contains the most complete and up-to-date educational program on the market. The most important features include:

- ♦ Innovative and up-to-date diagnostic techniques in infectious diseases and their application in daily clinical practice, including the use of cytology as a diagnostic tool in these diseases
- ♦ The most frequent and not so frequent pathologies of infectious origin in dogs from a practical and completely up-to-date point of view
- ♦ Infectious Pathologies oriented to the Feline Species, dealing extensively with all those of this species
- ♦ Vision "One Health", in which Zoonoses and their implications for public health will be reviewed
- ♦ Most frequent Infectious Pathologies of Dogs and Cats in the Tropics, with focus on Latin America. At present, there are no more exotic diseases, and they should be included by the clinician in the differential diagnosis when the epidemiology allows to suspect them
- ♦ Prevention and management of all infectious diseases, including clinical, home and community settings



*Get up to date on the use of systemic drugs in the veterinary field for the prevention and treatment of diseases affecting animal health"*

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*A revolutionary program for its ability to reconcile the highest quality of learning with the most complete online Education”*

Its teaching staff includes professionals belonging to the field of Veterinary Medicine, who bring to this training the experience of their work, as well as renowned specialists from reference societies and prestigious universities.

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 throughout the program. For this purpose, the professional will be assisted by an innovative interactive video system created by renowned and experienced psychology experts.

*Advance your skills and keep up to date with all the latest developments in pharmacological approaches in this particular area.*

*Learn efficiently, with a real qualification objective, with this Postgraduate Diploma, unique for its quality and price, in the online teaching market.*



# 02 Objectives

The objective of the Postgraduate Diploma is to provide the student with the required competencies in relation to preclinical or clinical research of drugs used in veterinary medicine, and their application in the therapeutic use of drugs in the systemic area, so that they can better integrate into the professional field.







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*Acquire the most up to date knowledge of Systemic Veterinary Pharmacology and the skills and attitudes for its practical application in an education created for excellence”*



## General Objectives

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- ♦ Differentiate the autonomic nervous system and its organization
- ♦ Identify the groups of drugs that act on the autonomic nervous system
- ♦ Recognize the mechanisms of action and therapeutic uses of this group of drugs
- ♦ Examine the main pharmacological properties of the groups of drugs acting on the central nervous system
- ♦ Identify the different pharmacological targets involved in CNS transmission
- ♦ Recognize the mechanisms of action, therapeutic and toxic uses of this group of drugs
- ♦ Examine the pharmacological basis of cardiorespiratory system therapy and homeostasis
- ♦ Identify the main therapeutic groups and their indications
- ♦ Determine the mechanisms of action of different drug groups, properties and pharmacokinetics
- ♦ Develop the student's critical and analytical skills through the resolution of clinical cases
- ♦ Determine the pharmacological basis of digestive tract therapy
- ♦ Identify the main therapeutic groups and their indications in veterinary medicine
- ♦ Examine different drug groups' mechanisms of action, properties and pharmacokinetics
- ♦ Develop the student's critical and analytical skills through the resolution of clinical cases





## Specific Objectives

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- ◆ Establish the classification of drugs according to their structure, mechanism of action and pharmacological action acting on the Autonomic Nervous System
- ◆ Distinguish the chemical mediators and receptors that interact in the Autonomic Nervous System
- ◆ Determine the classification of drugs by their mechanism of action and pharmacological action that act on the autonomic nervous system
- ◆ Analyze the drugs that act at the level of cholinergic transmission in the Autonomic Nervous System by their structure, mechanism of action and route of administration
- ◆ Examine drugs acting at the level of adrenergic transmission in the autonomic nervous system by their structure, mechanism of action and route of administration
- ◆ Determine the general effects of neuromuscular blocking agents on the peripheral nervous system by their mechanism of action and pharmacological action
- ◆ Solve problems and interpret results of pharmacological experiments associated with the organ bath technique
- ◆ Acquire the ability to search for and manage information related to the Autonomic Nervous System
- ◆ Establish the classification of drugs according to their structure, mechanism of action and pharmacological action acting on the Central Nervous System
- ◆ Always act with the objective of facilitating good health and quality of life for the animals, avoiding unnecessary suffering through the administration of different drugs

- ♦ Distinguish the chemical mediators and receptors that interact in pain
- ♦ Differentiate the classification of analgesic drugs by their mechanism of action and pharmacological action effecting the Central Nervous System
- ♦ Analyze the drugs that act at the level of anesthesia and sedation in the Central Nervous System by their structure, mechanism of action and route of administration
- ♦ Determine the general effects of stimulant drugs on the Central Nervous System and recognize their mechanism of action and pharmacological action
- ♦ Determine the general effects of depressant drugs on the Central Nervous System and recognize their mechanism of action and pharmacological action
- ♦ Describe the mechanisms of action of drugs used to treat heart failure, hypertension or arrhythmias
- ♦ Examine antianemic drugs and growth factors, as well as mechanisms of action, adverse reactions and pharmacokinetics
- ♦ Determine the main routes of administration of drugs used in the cardiorespiratory system and homeostasis
- ♦ Present the drugs used against cough, mucolytics and expectorants and their mechanisms of action, adverse reactions, pharmacokinetics and side effects
- ♦ Solve problems and clinical cases related to the cardiorespiratory system
- ♦ Associate the correct drug to the main symptoms and pathologies of the cardiorespiratory system
- ♦ Safe and effective use of pharmaceuticals
- ♦ Identify the most common routes of administration of each of the drugs and the forms of presentation of the same in veterinary medicine
- ♦ Examine drugs related to acid secretion: antisecretory, antacids and mucosal protectants, as well as their adverse effects, contraindications and pharmacokinetics
- ♦ Present drugs to improve gastrointestinal motility, their mechanisms of action, drug interactions and adverse reactions
- ♦ Describe the drugs used to treat vomiting
- ♦ Determine the pharmacology of the hepatobiliary and pancreatic systems, their mechanisms of action, interactions and pharmacokinetics
- ♦ Solve problems and clinical cases related to the digestive system
- ♦ Associate the correct drug to the main symptoms and pathologies of the digestive tract



*A path to achieve training and professional growth that will propel you towards a greater level of competitiveness in the employment market"*



03

# Course Management

The teaching team of this Postgraduate Diploma is made up of professionals specialized in the study of Pharmacology, both human and veterinary, with clinical experience in small and large animals. They have extensive and recognized teaching and research experience, with officially recognized six-year research periods, participation in numerous research projects and dissemination of their research both nationally and internationally in high impact journals, books and conferences.





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*A unique opportunity to learn from internationally renowned professors, with teaching, clinical and research experience”*

## Management



### **Dr Santander Ballestín, Sonia**

- ♦ Teaching Coordinator, Department of Pharmacology, University of Zaragoza, Spain
- ♦ Lecturer in the university course: "Introduction to Pharmacology: Principles for the Rational Use of Drugs" Basic Program of the University of Zaragoza
- ♦ Evaluation professor in objective structured clinical evaluation of the degree in Medicine
- ♦ Degree in Biology and Biochemistry, specializing in the area of Pharmacology
- ♦ PhD with the European Degree from the University of Zaragoza
- ♦ Master's Degree in Environment and Water Management. Andalusia Business School
- ♦ Title of the doctoral program: Biochemistry and Molecular and Cellular Biology



## Professors

### Ms. Lomba, Laura

- ♦ Professor of Pharmacokinetics and Physicochemistry at San Jorge University
- ♦ Degree in Chemistry from the University of Zaragoza
- ♦ Degree in Pharmacy and PhD from the Universidad San Jorge
- ♦ Predoctoral stay at the Cancer Therapy Institute (Bradford)
- ♦ She has ANECA accreditation in the positions of Assistant Professor Doctor, Hired Professor Doctor and Professor of Private University
- ♦ 1 six-year period recognized 2012-2017 by CNAI
- ♦ She has directed 10 grants for collaboration and initiation to research, 12 graduate theses and a doctoral thesis. She is currently supervising 3 doctoral theses
- ♦ In the teaching field, she has 6 scientific articles, 24 communications in congresses and 6 research projects

### Ms. Luesma Bartolomé, María José

- ♦ Veterinarian. Study Group on Prion Diseases, Vectorial Diseases and Emerging Zoonoses at the University of Zaragoza
- ♦ Study group of the University Research Institute
- ♦ Professor of Film and Anatomy. University degree: Complementary Academic Activities
- ♦ Professor of Anatomy and Histology University degree: Graduate in Optics and Optometry. University of Zaragoza
- ♦ Professor of Final Degree Project University Degree, Bachelor's Degree in Medicine
- ♦ Professor of Morphology. Development Biology University degree: Professional Master's Degree in Initiation to Research in Medicine. University of Zaragoza
- ♦ Doctor of Veterinary Medicine. Official Doctorate Program in Veterinary Sciences. University of Zaragoza
- ♦ Degree in Veterinary Medicine. University of Zaragoza

### Ms. Arribas Blázquez, Marina

- ♦ Degree in Biology. Specialty in Fundamental Biology and Biotechnology by the University of Salamanca
- ♦ Bill and Melinda Gates Foundation: teaching and postdoctoral research employment contract
- ♦ Institute of Biomedical Research: Alberto Sols Labor researcher and teacher
- ♦ Complutense de Madrid University: postdoctoral teaching and research labor contract
- ♦ Complutense de Madrid University: teaching and research employment contract
- ♦ Molecular Biology Center Severo Ochoa: teaching and predoctoral researcher labor contract
- ♦ Complutense de Madrid University: predoctoral teaching and research labor contract
- ♦ Category B qualification in Protection of animals used for experimental and other scientific purposes
- ♦ Master in Neurosciences
- ♦ Doctorate in Neuroscience from the Complutense University of Madrid
- ♦ Postgraduate Certificate in Culture Room Standards for the use of viral and other pathogenic biological agents at Instituto de Investigaciones Biomédicas de Madrid

04

# Structure and Content

This Postgraduate Diploma provides all the necessary knowledge to be able to practice Systemic Pharmacology in Veterinary Medicine in the best possible way. It is important to take into account that the contents allow the student to obtain specialized knowledge of pharmacology, as well as the ability to deal with different solutions for veterinary pathologies. A complete and accessible education path that will make a difference in your career progression.





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*A complete educational program that will provide you with the comprehensive information necessary to intervene as a specialist in the theoretical and practical aspects of Systemic Veterinary Pharmacology”*

## Module 1. Pharmacology of the Autonomus Nervous System

- 1.1. Peripheral Nervous System
  - 1.1.1. Definition
  - 1.1.2. Classification
  - 1.1.3. Autonomus Nervous System
    - 1.1.3.1. Definition
    - 1.1.3.2. Classification
- 1.2. Cholinergic Neurotransmitter System
  - 1.2.1. Definition
  - 1.2.2. Nicotinic and Muscarinic Receptors
  - 1.2.3. Classification of Drugs:
- 1.3. Pharmacology of Cholinergic Transmission I
  - 1.3.1. Transmission Blocking Drugs in Autonomus Ganglia
  - 1.3.2. Nicotinic Receptor Antagonists with Sympathokolytic Effects
  - 1.3.3. Nicotinic Receptor Antagonists with Parasympatholytic Effects (hexamethonium, mecamylamine)
- 1.4. Pharmacology of Cholinergic Transmission II
  - 1.4.1. Transmission-Blocking Drugs at Neuroeffector Junctions
  - 1.4.2. Muscarinic Receptor Antagonists
  - 1.4.3. Parasympatholytic Effects (Atropine, Scopolamine)
- 1.5. Pharmacology of Cholinergic Transmission
  - 1.5.1. Drugs that Mimic the Effects of Acetylcholine on Neuroeffector Junctions
  - 1.5.2. Muscarinic Receptor Agonists
  - 1.5.3. Parasympathomimetic Effects (acetylcholine, methacholine, betanechol)
- 1.6. Adrenergic Neurotransmitter System
  - 1.6.1. Definition
  - 1.6.2. Adrenergic Receptors
  - 1.6.3. Classification of Drugs
- 1.7. Pharmacology of Adrenergic Transmission
  - 1.7.1. Drugs that Promote Noradrenaline at Neuroeffector Synapses
- 1.8. Pharmacology of Adrenergic Transmission
  - 1.8.1. Transmission-Blocking Drugs at Neuroeffector Junctions





- 1.9. Pharmacology of Adrenergic Transmission
  - 1.9.1. Drugs that Mimic the Effects of Noradrenaline at Neuroeffector Junctions
- 1.10. Pharmacology in the Motor Plate
  - 1.10.1. Ganglionic or Ganglioplegic Blocking Drugs
  - 1.10.2. Non-Depolarizing Neuromuscular Blocking Drugs
  - 1.10.3. Depolarizing Neuromuscular Blocking Drugs

## Module 2. Pharmacology of the Central Nervous System

- 2.1. Pain
  - 2.1.1. Definition
  - 2.1.2. Classification
  - 2.1.3. Pain Neurobiology
    - 2.1.3.1. Transduction
    - 2.1.3.2. Transmission
    - 2.1.3.3. Modulation
    - 2.1.3.4. Perception
  - 2.1.4. Animal Models for the Study of Neuropathic Pain
- 2.2. Nociceptive Pain
  - 2.2.1. Neuropathic Pain
  - 2.2.2. Pathophysiology of Neuropathic Pain
- 2.3. Analgesic Drugs. Nonsteroidal Anti-Inflammatory Drugs
  - 2.3.1. Definition
  - 2.3.2. Pharmacokinetics
  - 2.3.3. Mechanism of Action
  - 2.3.4. Classification
  - 2.3.5. Pharmacological Effects
  - 2.3.6. Side effects:
- 2.4. Analgesic Drugs. Steroidal Anti-Inflammatory Drugs
  - 2.4.1. Definition
  - 2.4.2. Pharmacokinetics
  - 2.4.3. Mechanism of Action. Classification
  - 2.4.4. Pharmacological Effects
  - 2.4.5. Side effects:

- 2.5. Analgesic Drugs. Opioids
  - 2.5.1. Definition
  - 2.5.2. Pharmacokinetics
  - 2.5.3. Mechanism of Action. Opioid Receptors
  - 2.5.4. Classification
  - 2.5.5. Pharmacological Effects
    - 2.5.5.1. Side effects:
- 2.6. Pharmacology of Anesthesia and Sedation
  - 2.6.1. Definition
  - 2.6.2. Mechanism of Action
  - 2.6.3. Classification: General and Local Anesthetics
  - 2.6.4. Pharmacological Properties
- 2.7. Local Anesthetic. Inhalation Anesthetics
  - 2.7.1. Definition
  - 2.7.2. Mechanism of Action
  - 2.7.3. Classification
  - 2.7.4. Pharmacological Properties
- 2.8. Non-Injectable Anesthetics
  - 2.8.1. Neuroleptoanesthesia and Euthanasia. Definition
  - 2.8.3. Mechanism of Action
  - 2.8.3. Classification
  - 2.8.4. Pharmacological Properties
- 2.9. Central Nervous System Stimulant Drugs
  - 2.9.1. Definition
  - 2.9.2. Mechanism of Action
  - 2.9.3. Classification
  - 2.9.4. Pharmacological Properties
  - 2.9.5. Side effects:
  - 2.9.6. Antidepressants
- 2.10. Central Nervous System Depressant Drugs
  - 2.10.1. Definition
  - 2.10.2. Mechanism of Action

- 2.10.3. Classification
- 2.10.4. Pharmacological Properties
- 2.10.5. Side Effects:
- 2.10.6. Anticonvulsants

### Module 3. Pharmacology of the cardiovascular, renal and respiratory system. Hemostasis

- 3.1. Pharmacology of the Cardiovascular System I
  - 3.1.1. Positive Inotropic and Inodilator Drugs
  - 3.1.2. Sympathomimetic Amines
  - 3.1.3. Glycosides
- 3.2. Pharmacology of the Cardiovascular System II
  - 3.2.1. Diuretic Drugs
- 3.3. Pharmacology of the Cardiovascular System III
  - 3.3.1. Drugs Acting on the Renin-Angiotensin System
  - 3.3.2. Beta-Adrenergic Antagonist Drugs
- 3.4. Pharmacology of the Cardiovascular System IV
  - 3.4.1. Vasodilator Drugs
  - 3.4.2. Calcium Channel Antagonists
- 3.5. Pharmacology of the Cardiovascular System V
  - 3.5.1. Antiarrhythmic Drugs
- 3.6. Pharmacology of the Cardiovascular System VI
  - 3.6.1. Antianginal Drugs
  - 3.6.2. Lipid-Lowering Drugs
- 3.7. Blood Pharmacology I
  - 3.7.1. Anti-Anemia Drugs
    - 3.7.1.1. Iron
    - 3.7.1.2. Folic Acid
    - 3.7.1.3. Vitamin b12
  - 3.7.2. Hematopoietic Growth Factors
    - 3.7.2.1. Erythropoietin
    - 3.7.2.2. Granulocyte Colony Stimulating Factors

- 3.8. Blood Pharmacology II
  - 3.8.1. Antithrombotic Drugs
  - 3.8.2. Anti-Aggregation Drugs
  - 3.8.3. Anticoagulants
  - 3.8.4. Fibrinolytic drugs
- 3.9. Pharmacology of the Respiratory System I
  - 3.9.1. Antitussives
  - 3.9.2. Expectorants
  - 3.9.3. Mucolytics
- 3.10. Pharmacology of the Respiratory System II
  - 3.10.1. Bronchodilators (Methylxanthines, Sympathomimetics, Antimuscarinics)
  - 3.10.2. Anti-inflammatory Drugs used in Asthma
  - 3.10.3. Anti-inflammatory Drugs Used in Chronic Obstructive Pulmonary Disease (Corticosteroids, Mediator Release Inhibitors, Leukotriene Inhibitors)

## Module 4. Pharmacology of the digestive system

- 4.1. Pharmacology of Acid Secretion I
  - 4.1.1. Physiology of Secretion and Main Alterations
  - 4.1.2. Antisecretory Agents
  - 4.1.3. Proton Pump Inhibitors
  - 4.1.4. Histamine H<sub>2</sub>-Receptor Antagonists
- 4.2. Pharmacology of Acid Secretion II. Antacids
  - 4.2.1. Magnesium Compounds
  - 4.2.2. Aluminum Compounds
  - 4.2.3. Calcium Carbonate
  - 4.2.4. Sodium Bicarbonate
- 4.3. Pharmacology of Acid Secretion III. Mucous Membrane Protectors
  - 4.3.1. Sucralfate
  - 4.3.2. Bismuth Salts
  - 4.3.3. Prostaglandin Analogs
- 4.4. Pharmacology of Ruminants
  - 4.4.1. Biochemical Alterations of Drugs in the Rumen
  - 4.4.2. Effects of Drugs on Ruminal Microflora
  - 4.4.3. Drug Distribution in the Rumen-Reticulum
  - 4.4.4. Salivary Secretion of Drugs
  - 4.4.5. Agents Affecting Pre-stomach Functions
  - 4.4.6. Treatment of Meteorism, Tympanism, Ruminal Acidosis and Atonia
- 4.5. Pharmacology of Intestinal Motility I
  - 4.5.1. Physiology of Motility and Main Alterations
  - 4.5.2. Prokinetic Drugs
- 4.6. Pharmacology of Intestinal Motility II
  - 4.6.1. Antidiarrheal Drugs
  - 4.6.2. Prebiotics, Probiotics and Flora
- 4.7. Pharmacology of Intestinal Motility III. Constipation
  - 4.7.1. Bolus-Forming Drugs
  - 4.7.2. Lubricants and Emollients
  - 4.7.3. Osmotic Laxatives
  - 4.7.4. Stimulant Laxatives
  - 4.7.5. Enemas
- 4.8. Pharmacology of Vomiting
  - 4.8.1. Antiemetic and Emetic Drugs
  - 4.8.2.  $\alpha_2$  Dopaminergic Antagonists
  - 4.8.3. Antihistamines
  - 4.8.4. Muscarinic Antagonists
  - 4.8.5. Serotonergic Antagonists
- 4.9. Pharmacology of the Hepatobiliary and Pancreatic System
  - 4.9.1. Choleric and Cholagogue Drugs
- 4.10. Pharmacology of Inflammatory Bowel Disease
  - 4.10.1. Corticoids
  - 4.10.2. Immunosuppressants
  - 4.10.3. Antibiotics
  - 4.10.4. Aminosalicylates

# 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 Diploma in Systemic Veterinary Pharmacology guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Diploma issued by TECH Technological University.





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

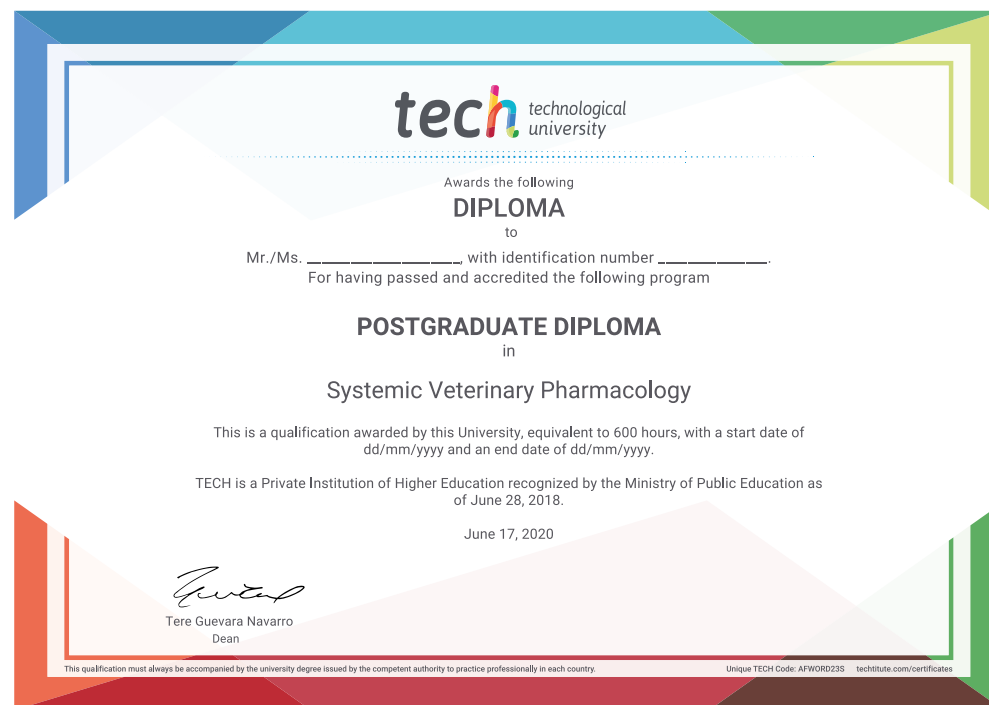
This **Postgraduate Diploma in Systemic Veterinary Pharmacology** contains the most complete and up-to-date scientific program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Diploma** issued by **TECH Technological University** via tracked delivery\*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the **Postgraduate Diploma**, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Diploma in Systemic Veterinary Pharmacology**

Official N° of Hours: **600 h.**



\*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

online training

development languages

virtual classroom

**tech** technological  
university

**Postgraduate Diploma**  
Systemic Veterinary  
Pharmacology

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

# Postgraduate Diploma

## Systemic Veterinary Pharmacology

