

# Postgraduate Certificate

## Reproductive Physiology and Pathophysiology in Females





## Postgraduate Certificate Reproductive Physiology and Pathophysiology in Females

- » 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/reproductive-physiology-pathophysiology-females](http://www.techtute.com/us/veterinary-medicine/postgraduate-certificate/reproductive-physiology-pathophysiology-females)

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# 01

# Introduction

This program will develop an in-depth study of the physiological and pathophysiological activity of reproduction in mammalian females, an essential process to establish the scientific basis for the application of reproductive biotechnologies. The development of any application work in females involves the knowledge of the estrous cycle and the sexual cycle of the species and breed, as well as the control mechanism and the accuracy in the results and diagnoses issued to ensure a correct functioning of the sexual activity of the female.





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*This program is the best option you can find to specialize in Reproductive Physiology and Pathophysiology in Females and make more accurate diagnoses"*

From the earliest data on animal reproduction in Egyptian hieroglyphs, through the ancient veterinarians to the present day, man has always been interested in the study of animal reproduction to increase populations and obtain better yields.

Animal reproduction has evolved exponentially in recent decades and its current development means that technologies implemented a few years ago are now obsolete. Technique, science and human genius combine and bring, as a consequence, results identical to natural reproduction.

The objective of this program focuses on the mastery and control of all physiological, pathological and biotechnological aspects that affect the reproductive organ function of domestic animals. The species studied in this Postgraduate Certificate are: bovids, equids, swine, sheep, goats and canids; a selection made based on the importance and development of assisted reproduction at present.

This Postgraduate Certificate is developed to deepen the current knowledge of the specialization in the different techniques of Reproductive Physiology and Physiopathology in Females.

The group of professors teaching the Postgraduate Certificate is made up of specialists in animal reproduction with a work history of more than 30 years of experience, not only in the field of teaching, but also with practical activity, research and directly in livestock farms and animal reproduction centers. In addition, the teaching team is actively developing the latest techniques in assisted reproduction biotechnologies, making available to the market genetic material of different species of international zotechnical interest.

The specialization will be based on the theoretical and scientific aspects, combining them with the practical and applicative professionalism of each of the subjects in the current work. Continuous training after completing undergraduate studies is sometimes complicated and difficult to combine with work and family activities, so with this Postgraduate Certificate TECH gives the possibility to continue specializing online with a large amount of practical audiovisual support that will allow the student to advance in reproductive techniques in their work environment.

This **Postgraduate Certificate in Reproductive Physiology and Pathophysiology in Females** contains the most complete and up-to-date scientific program on the market.

The features are:

- ♦ Practical cases presented by experts in Reproductive Physiology and Pathophysiology in Females
- ♦ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional development
- ♦ Latest developments in Reproductive Physiology and Pathophysiology in Females
- ♦ Practical exercises where self-assessment can be used to improve learning
- ♦ Special emphasis on innovative methodologies in Reproductive Physiology and Pathophysiology in Females
- ♦ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ♦ Content that is accessible from any fixed or portable device with an Internet connection



*Don't miss the opportunity to study this Postgraduate Certificate in Reproductive Physiology and Pathophysiology in Females with us. It's the perfect opportunity to advance your career"*

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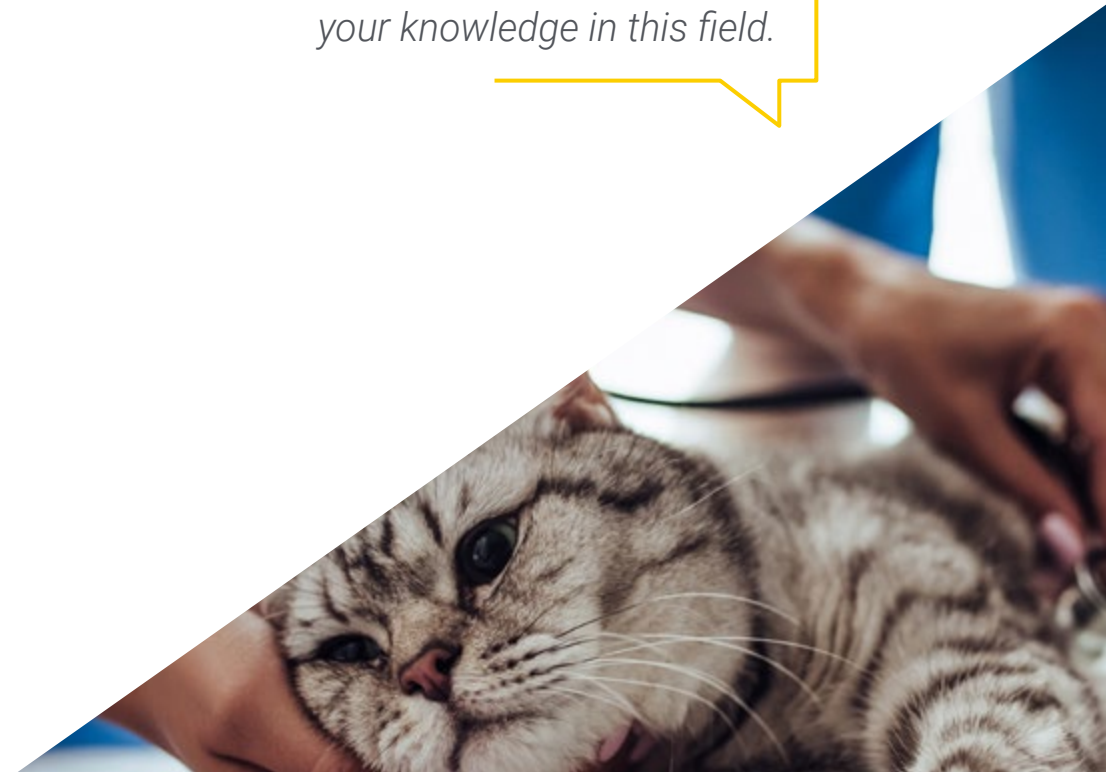
*This Postgraduate Certificate is the best investment you can make when selecting a refresher program to update your knowledge in Reproductive Physiology and Pathophysiology in Females”*

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 knowledge programmed to learn in real situations.

This program is designed around Problem-Based Learning, whereby the professional 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 experts in Reproductive Physiology and Pathophysiology in Females.

*This program 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.*



# 02 Objectives

The Postgraduate Certificate in Reproductive Physiology and Pathophysiology in Females 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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*This is the best option to learn about the latest advances in Reproductive Physiology and Pathophysiology in Females"*



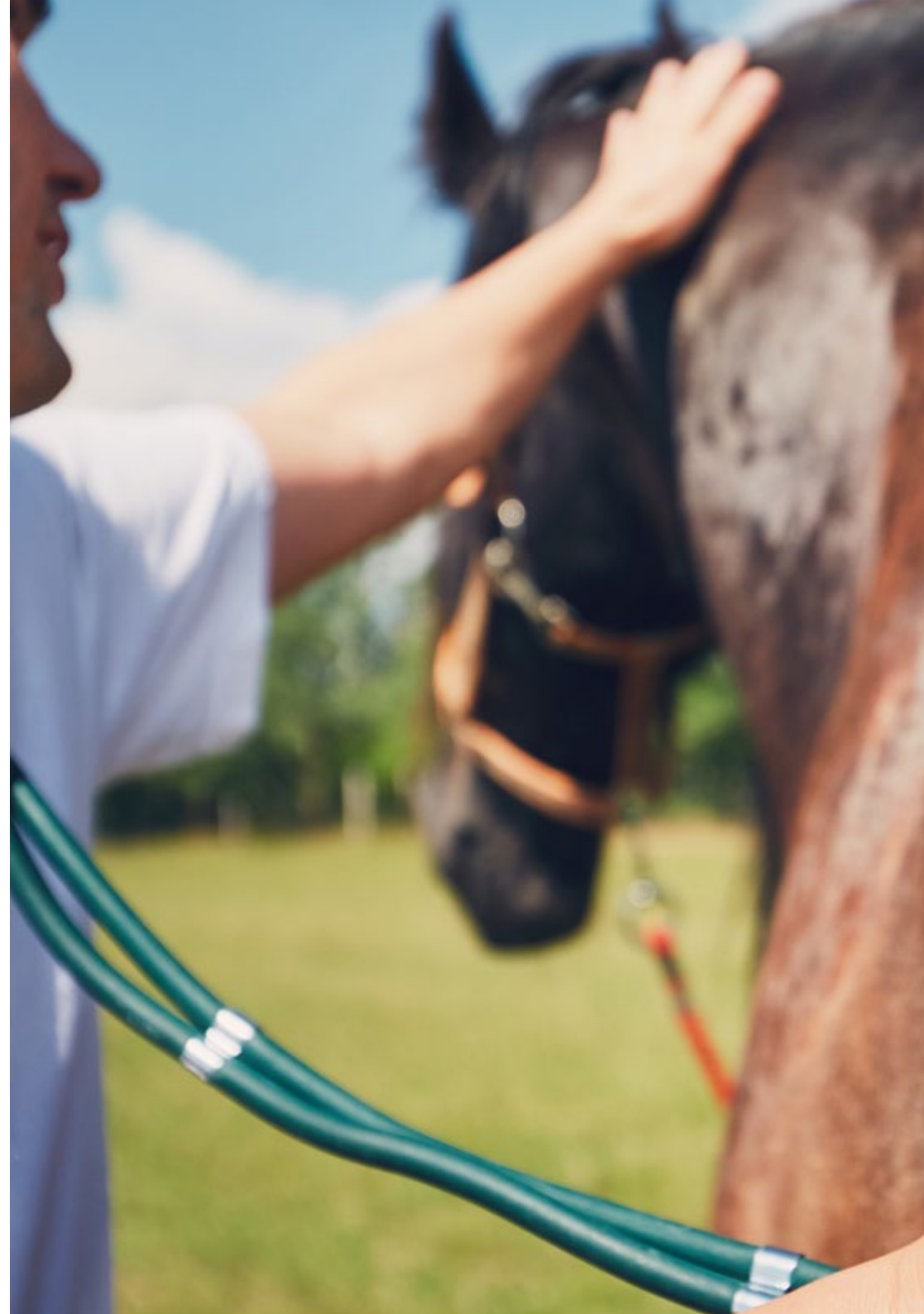
## General Objectives

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- Examine all reproductive methods existing in nature and their evolution
- Develop all the anatomical structures of the reproductive system of different mammals
- Establish the essential knowledge of the interconnection between the CNS and the hypothalamic-pituitary axis
- Analyze the hormonal interconnections of mammal reproduction
- Determine the onset of sexual activity as a method of improving production systems
- Analyze the physiology of reproduction in females
- Establish the specific and concrete differences between the estrous cycle and the sexual cycle in different mammalian females
- Define the pathologies that affect reproduction programs in females



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





## Specific Objectives

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- ♦ Analyze the methods of sexual and asexual reproduction
- ♦ Deepen in the specific anatomical bases of each species
- ♦ Establish the pattern of CNS interconnection and its relationships with reproduction
- ♦ Identify release factors and growth factors related to reproduction
- ♦ Determine all hormones involved in reproduction
- ♦ Develop the neuroendocrine activity of the hypothalamic-pituitary axis
- ♦ Establish sexual behavioral changes at the onset of puberty
- ♦ Demonstrate the onset of sexual activity in females and the functioning of the hypothalamic-pituitary-gonadal axis
- ♦ Develop the scientific mechanisms of follicular surges in the sexual cycle
- ♦ Identify hormonal factors for growth and regulation of oocyte maturation
- ♦ Examine and establish the importance of the corpus luteum as an endocrine organ in female reproduction
- ♦ Substantiate the importance of the uterus and its physiology in the development of gestation
- ♦ Evaluate postpartum reproductive activity of females
- ♦ Compile methods of diagnosis and treatment of reproductive pathologies in females

03

# Course Management

The program's teaching staff includes leading experts in Reproductive Physiology and Pathophysiology in Females who contribute their vast work experience to this educational program. They are world-renowned doctors from different countries with proven theoretical and practical professional experience.



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*Our teaching faculty, experts in Reproductive Physiology and Pathophysiology in Females, will help you achieve success in your profession"*

## Management



### Dr. Gomez Peinado, Antonio

- Coordinator of Obstetrics and Reproduction at Alfonso X El Sabio University, Faculty of Veterinary Medicine
- Degree in Veterinary Medicine
- Doctorate in Alfonso X El Sabio University Faculty of Veterinary Medicine - Professor of Animal Production



### Dr. Gómez Rodríguez, Elisa

- Work development of assisted reproduction techniques at the " Spanish Institute of Animal Genetics and Reproduction" (IEGRA) in Talavera de la Reina, Toledo
- Professor of Veterinary Medicine at the Alfonso X El Sabio University
- Degree in Veterinary Medicine, Complutense University Madrid
- Postgraduate course "Assisted Reproduction in Cattle Taught by IEGRA, UAX and HUMEKO, Talavera de la Reina
- Course on "Bovine Reproductive Ultrasound" Taught by Dr. Giovanni Gnemmi (HUMEKO), Talavera de la Reina



## Professors

### Mr. Pinto González, Agustín

- Veterinarian of the Spanish Institute of Animal Genetics and Reproduction
- Sani Lidia's Veterinarian
- Degree in Veterinary Medicine
- Specialization in Animal Reproduction at IEGRA
- IEGRA's Diploma in Artificial Insemination in Cattle

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*The leading professionals in the field have come together to offer you the most comprehensive knowledge in this field, so that you can develop with total guarantees of success”*

04

# Structure and Content

The structure of the contents has been designed by the best professionals in the field of Reproductive Physiology and Pathophysiology in Females, with extensive experience and recognized prestige in the profession, backed by the volume of cases reviewed, studied and diagnosed, and with extensive knowledge of new technologies applied to veterinary medicine.







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*This Postgraduate Certificate in Reproductive Physiology and Pathophysiology in Females contains the most complete and up-to-date scientific program on the market”*

## Module 1. Introduction to the Reproduction of Domestic Mammals Anatomy and Endocrinology

- 1.1. Review of Reproductive Methods in Nature and Their Evolution to Mammals
  - 1.1.1. Reproduction in Animals, Evolution and Development of Reproductive Changes in Nature
  - 1.1.2. Asexual Reproduction in Animals
  - 1.1.3. Sexual Reproduction Mating and Sexual Behavior
  - 1.1.4. The Different Reproductive Systems and Their Application in Animal and Human Research
- 1.2. Anatomy of the Female Genital Tract
  - 1.2.1. Genital Organs of the Cow
  - 1.2.2. Genital Organs of the Mare
  - 1.2.3. Genital Organs of the Sow
  - 1.2.4. Genital Organs of the Sheep
  - 1.2.5. Genital Organs of the Goat
  - 1.2.6. Genital Organs of the Female Dog
- 1.3. Anatomy of the Male Genital Tract
  - 1.3.1. Genital Organs of the Bull
  - 1.3.2. Genital Organs of the Horse
  - 1.3.3. Genital Organs of the Boar
  - 1.3.4. Genital Organs of the Ram
  - 1.3.5. Genital Organs of the Male Goat
  - 1.3.6. Genital Organs of the Dog
- 1.4. The Central Nervous System (CNS) and Its Relationship to Animal Reproduction
  - 1.4.1. Introduction
  - 1.4.2. Nervous Bases of Sexual Behavior
  - 1.4.3. Regulation of Pituitary Gonadotropin Secretion by the Nervous System
  - 1.4.4. Regulation of the Onset of Sexual Activity by the CNS
  - 1.4.5. Effects of Hormones on CNS Development and Differentiation
- 1.5. The Hypothalamic-Pituitary System
  - 1.5.1. Hypothalamic-Pituitary System Morphology
  - 1.5.2. Metabolic Mechanisms of the Release Factors
  - 1.5.3. Structure and Function of the Pituitary Gland
  - 1.5.4. Hormone-Releasing Hormones: Adenohypophysis and Neurohypophysis
- 1.6. Gonadotropins and Their Regulation
  - 1.6.1. Chemical Structure of Gonadotropins
  - 1.6.2. Physiological Characteristics of Gonadotropins
  - 1.6.3. Biosynthesis, Metabolism and Catabolism of Gonadotropins
  - 1.6.4. Regulation of FSH and LH Secretion
- 1.7. Steroidogenesis and Progesteronemia: Their Enzymes and Genomic Regulation
  - 1.7.1. Steroidogenesis, Biosynthesis, Metabolism and Catabolism
  - 1.7.2. Progesteronemia, Biosynthesis, Metabolism and Catabolism
  - 1.7.3. Androgens, Biosynthesis, Metabolism and Catabolism
  - 1.7.4. Intervention of Genomics and Epigenetics in the Changes of Gonadal Hormone Enzyme Activity
- 1.8. Growth Factors in the Reproduction of Mammals
  - 1.8.1. Growth Factors and Their Implication in Reproduction
  - 1.8.2. Action Mechanism of the Growth Factors
  - 1.8.3. Types of Growth Factors Related to Reproduction
- 1.9. Hormones Involved in Reproduction
  - 1.9.1. Placental Hormones: ECG, HCG, Placental Lactogens
  - 1.9.2. Prostaglandins, Biosynthesis and Metabolic Activities
  - 1.9.3. Neurohypophyseal Hormones
  - 1.9.4. Gonadal Hormones
  - 1.9.5. Synthetic Hormones
- 1.10. Sexual Behavior Onset of Reproductive Activity in Young Animals
  - 1.10.1. Ecology and Animal Reproductive Behavior in Reproduction
  - 1.10.2. Prepubertal Period in Domestic Animals
  - 1.10.3. Puberty
  - 1.10.4. Post-Puberty Period
  - 1.10.5. Specific Methodologies and Treatments for Altering the Onset of Sexual Activity

**Module 2. Female Reproduction**

- 2.1. Reproductive Physiology in Females
  - 2.1.1. Onset of Sexual Activity in Females
  - 2.1.2. Hypothalamic-Pituitary-Gonadal Axis
  - 2.1.3. Hormone Control Feedback System
  - 2.1.4. Intervention of Photoperiod in Female Reproductive Physiology
- 2.2. Estrous Cycle and Sexual Cycle Follicular Waves
  - 2.2.1. Estrous Cycle and Sexual Cycle in the Cow
  - 2.2.2. Estrous Cycle and Sexual Cycle in the Mare
  - 2.2.3. Estrous Cycle and Sexual Cycle in Sows
  - 2.2.4. Estrous Cycle and Sexual Cycle in the Goat
  - 2.2.5. Estrous Cycle and Sexual Cycle in Sheep
  - 2.2.6. Estrous Cycle and Sexual Cycle in Female Dogs
- 2.3. Oocyte Maturation and Ovulation
  - 2.3.1. Nuclear Maturation of the Oocyte
  - 2.3.2. Cytoplasmic Maturation of the Oocyte
  - 2.3.3. Hormones and Growth Factors in the Regulation of Oocyte Maturation
  - 2.3.4. Phenomenology of Ovulation
  - 2.3.5. Ovulation Disorders
- 2.4. Corpus Luteum Histology and Pathophysiology
  - 2.4.1. Luteal Cells Histology of the Corpus Luteum
  - 2.4.2. Morphological and Functional Evolution of the Corpus Luteum
  - 2.4.3. Luteolysis
  - 2.4.4. Pathophysiology of the Corpus Luteum
- 2.5. The Uterus and Preparation for Pregnancy
  - 2.5.1. The Uterus as an Organ of Gestation Reception
  - 2.5.2. Histological and Physiological Study of the Uterus
  - 2.5.3. Changes Produced in the Uterus from the Beginning of Gestation to Its Termination
  - 2.5.4. Uterine Pathophysiology
- 2.6. Beginning of Postpartum Reproductive Activity
  - 2.6.1. Physiological Conditions Occurring after Childbirth
  - 2.6.2. Recovery of Hypothalamic-Pituitary Activity
  - 2.6.3. Structural Changes of the Gonads in the Postpartum Period
  - 2.6.4. Etiological and Therapeutic Study of Postpartum Anestrus
  - 2.6.5. Fertility-Related Postpartum Incidences
- 2.7. Oocyte Biology and Pathology
  - 2.7.1. Oocyte Morphology
  - 2.7.2. Impact of Nutrition on Oocyte Quality
  - 2.7.3. Alterations in Oocyte Gene Expression
- 2.8. Reproductive Pathologies in Females
  - 2.8.1. Extrinsic Factors Affecting Reproduction in Females
  - 2.8.2. Congenital and Fetal Disorders
  - 2.8.3. Infectious Infertility
  - 2.8.4. Physical and Chromosomal Abnormalities
  - 2.8.5. Hormonal Disorders
- 2.9. Chromosomal Behavior and Achromatic Spindle Formation in Mammalian Oocytes
  - 2.9.1. Introduction
  - 2.9.2. Formation of Achromatic Spindle in Metaphase I and Metaphase II
  - 2.9.3. Chromosome Dynamics and Segregation During Metaphase I and Metaphase II
- 2.10. Follicle and Oocyte Metabolism in Vivo and In Vitro
  - 2.10.1. Relationships between Follicular Cells and the Oocyte
  - 2.10.2. Metabolism of Primordial Follicles and Oocytes
  - 2.10.3. Metabolism of Growing Follicles and Oocytes
  - 2.10.4. Metabolism During the Perioviulatory Period



*This program will allow you to  
advance in your career comfortably"*

# 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 Reproductive Physiology and Pathophysiology in Females guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Global University.



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

This program will allow you to obtain your **Postgraduate Certificate in Reproductive Physiology and Pathophysiology in Females** 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.

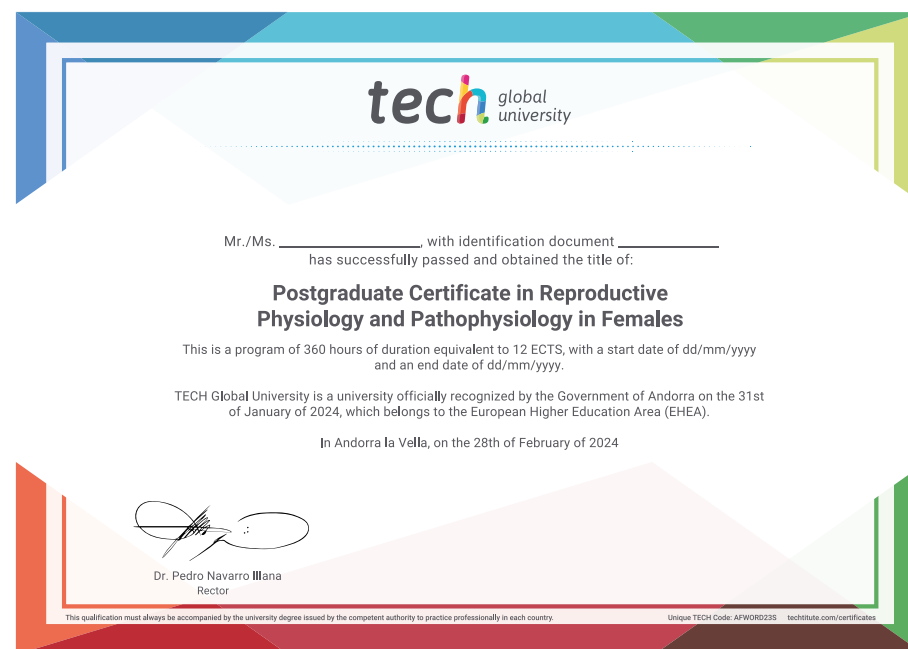
This **TECH Global University** title is a European program of continuing education and professional updating that guarantees the acquisition of competencies in its area of knowledge, providing a high curricular value to the student who completes the program.

Title: **Postgraduate Certificate in Reproductive Physiology and Pathophysiology in Females**

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.



**Postgraduate Certificate**  
Reproductive Physiology and  
Pathophysiology in Females

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

# Postgraduate Certificate

## Reproductive Physiology and Pathophysiology in Females

