

## 28423 - General Pathological Anatomy

### Syllabus Information

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**Academic Year:** 2019/20

**Subject:** 28423 - General Pathological Anatomy

**Faculty / School:** 105 - Facultad de Veterinaria

**Degree:** 451 - Degree in Veterinary Science

**ECTS:** 8.0

**Year:** 3

**Semester:** Annual

**Subject Type:** Compulsory

**Module:** ---

## 1. General information

### 1.1. Aims of the course

The goal of Pathological Anatomy is to study the lesions that occur in the different cells, tissues and organs during the course of the disease.

The course forms part of the Clinical Sciences Module within the specific subjects of the Degree in Veterinary Medicine and is related to the formative process of Cytology and Histology and General Pathology

### 1.2. Context and importance of this course in the degree

The knowledge of the morphological alterations that occur and of the different pathogenic mechanisms that intervene in the diseases, is one of the most relevant blocks of the veterinary pathology. On one hand, it is a question of understanding how different etiological agents act on organic systems inducing changes that can be observed and interpreted. This course will also provide the student with terminology that will complement their training and help them in the correct writing and interpretation of reports. The students are also trained in necropsy, an important diagnostic tool for the veterinarian in his daily activity, which helps to better understand what has been clinically observed in the live animal.

### 1.3. Recommendations to take this course

Basic knowledge of anatomy, biology, chemistry, biochemistry, cellular and molecular biology, cytology and histology.

## 2. Learning goals

### 2.1. Competences

On successful completion of this course, students will be able to:

- Recognize the different types of lesions and their association with pathological processes.
- Understand the pathogenesis of general alterations in the structure and function of cells, tissues, organs and systems.
- Perform animal necropsies and recognize macro and microscopic lesions and take samples for histopathological studies.
- Carry out post-mortem veterinary inspection.
- Search and manage information related to veterinary pathological anatomy

### 2.2. Learning goals

If students complete the course successfully, they should be able to

- Know and use correctly the basic terminology of General Pathological Anatomy, macro and microscopic.
- Identify and describe the most common types of macro and microscopic lesions in cells, tissues and organs.
- Know the pathogenic mechanisms that are activated in the animal organism when different pathogens act, as well as their evolution and consequences.
- Know and know how to perform the necropsy technique on animals, as well as the correct collection and shipment of samples for anatomopathological diagnosis.

- Know the anatomopathological basis of postmortem veterinary inspection.
- Manage correctly the sources of bibliographic information related to the subject.

### 2.3.Importance of learning goals

In Veterinary studies it is necessary to know the morphological alterations provoked in animal organisms by the action of diverse causes both at a microscopic and macroscopic level. The knowledge of this subject is fundamental for the understanding of other disciplines.

## 3.Assessment (1st and 2nd call)

### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

#### Evaluation activities

Students must demonstrate that they have achieved the expected learning outcomes by taking a theoretical-practical examination during the official announcements: June and September. Also, a partial examination will be carried out in the middle of the course.

For the June or September exams, the note of the partial exam will be kept for the students who have passed it. The theoretical-practical examinations shall consist of two parts:

- A theoretical exam that will include multiple-choice questions without penalty, true or false, and short answer questions.
- A practical examination consisting of the identification of macro and microscopic lesions projected onto images.

#### Global assessment test

Pupils who have not attended a minimum of 80% of the face-to-face practical teaching must prove that they have acquired the practical skills corresponding to the teaching not received by means of a specific examination.

#### Valuation criteria and requirement levels

Out of a maximum of 100 points to be obtained, the value of the tests will be as follows:

- Theoretical exam: 60 points
- Practical injury identification test: 40 points.

Both exams (theoretical and practical) must be passed separately.

To pass the subject it will be necessary:

- Have performed the mandatory practices of necropsy, demonstration of macroscopic lesions and histopathology or have performed the specific practical examination
- Pass 50% of the theoretical and practical tests referred.

#### Marking system:

According to the national regulation Law 1025/2003, 5th of September which lays down the European system of credits and marking system for the university degree.

0-4,9: FAIL.

5,0-6,9: PASS

7,0-8,9: GOOD (NT).

9,0-10: EXCELLENT (SB).

As the article 158 of the Statutes of the University of Zaragoza lays down, provisional grades will be displayed at least for 7 days and students will be able to review them on the date, time and place provided for that purpose.

## 4.Methodology, learning tasks, syllabus and resources

### 4.1.Methodological overview

The learning process that is designed for this subject is based on:

1. Lectures: The topics tackled in this course will be presented, explained and discussed in 50 minute lectures where ppt presentations will be used for image support.
2. Practical classes: Students enrolled in General Pathology undertake 4 types of compulsory internship:

1. Necropsies. Students should be able to perform systematic and complete opening of the animal carcass.
2. Demonstration of macroscopic lesions from slaughterhouse. Identify and describe the different types of injuries that can be found in livestock species slaughtered at the abattoir.
3. Histopathology. Microscopic changes that support the macroscopic study and contribute to a better understanding of the meaning of the lesions studied.
4. Seminars.

1. Tutorials: Consultations with a teacher to clarify issues related to the subject.

## 4.2.Learning tasks

The learning process that is designed for this subject is based on:

Lectures, Practical classes and Tutorials (see 5.3. Program)

## 4.3.Syllabus

### THEORY

#### Part I - Introduction.

1. Objectives: Guide of the subject
2. General concepts: General Pathology. Antemortem and postmortem lesions

#### Part II - Adaptation, damage and cell death.

1. Adaptation cell damage and cell death: Cellular adaptation. Causes of damage. Irreversible cell damage. Apoptosis and necrosis.
2. Adaptation cell damage and cell death: Chronic cellular adaptation: Atrophy. Hypertrophy. Hyperplasia. Metaplasia.
3. Pathological Deposits: Disturbances in water exchange and glycogen stores.
4. Pathological Deposits: Lipids.
5. Pathological Deposits: Proteins.
6. Pathological Deposits: Pigments
7. Pathological Deposits: Minerals.

#### Part III - Circulatory disorders.

10 Active and passive hyperaemia. Oedema

1. Haemorrhage: Types. Consequences. Evolution.
2. Thrombosis and disseminated intravascular coagulation (DIC).
3. Embolism. Types and consequences.
4. Anaemia, ischemia and infarction: Concept. Types. Consequences and evolution.
5. Lymphatic circulation disorders
6. General disorders of blood circulation. Shock.

#### Part IV - Inflammation and repair.

1. Inflammation: General concepts. Causes. Terminology and classification
2. Acute inflammation.
3. Chemical mediators of inflammation.
4. Morphological patterns of acute inflammation (I): Serous. Fibrinous.
5. Morphological patterns of acute inflammation (II): Mucous. Purulent. Hemorrhagic.
6. Morphological patterns of acute inflammation (III): Mixed forms of inflammation. Evolution of acute inflammation.
7. Chronic inflammation. Morphological patterns of chronic inflammation.
8. Granulomatous and not granulomatous inflammation.
9. Resolution of inflammation: (I) Regeneration. (II) Repair or cicatrization.

#### Part V - Disturbances development.

1. Aplasia, hypoplasia. Congenital malformations.

#### Part VI - Neoplasms.

1. Definition and general concepts. Characteristics of benign and malignant tumours.
2. Evolution of neoplasms
3. Stromal tumour and immune response.
4. Effects of tumours in the host.
5. Molecular basis of neoplasms.
6. Cancer Aetiology.
7. Epithelial and glandular tumours.
8. Connective tissue tumours.
9. Lymphohematopoietic, endocrine and nervous tumours.

#### **Part VII - Immunopathology.**

1. Immunodeficiency diseases
2. Hypersensitivity diseases
3. Autoimmunity diseases

#### **Part IX - Introduction to systemic pathology.**

1. Systemic pathology of the circulatory system
2. Systemic pathology of the respiratory tract
3. Systemic pathology of the digestive tract
4. Systemic pathology of the urinary system
5. Systemic pathology of the nervous system
6. Musculoskeletal systemic pathology

#### **LABORATORY PRACTICAL CLASSES WITH THE FOLLOWING CONTENTS:**

1. Necropsies

Students will conduct systematic and complete necropsies of mammals and birds. 10 hours per student is scheduled for this practice activity

\* For access to the necropsy room it is essential to wear nitrile or latex gloves, high rubber boots, overalls and goggles. For security reasons access to anyone not suitably equipped it will be prevented.

1. Macroscopic lesions. 4 hours per student is scheduled for carrying out this activity.
2. Histopathology. 8 hours per student is scheduled for carrying out this activity.
3. Seminars. 8 hours per student is scheduled to perform this activity.

#### **4.4.Course planning and calendar**

[http://veterinaria.unizar.es/horarios1.php?COD\\_TITULACION=6](http://veterinaria.unizar.es/horarios1.php?COD_TITULACION=6)

#### **4.5.Bibliography and recommended resources**

<http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=28423>