Information about the subject

Degree: Bachelor of Science Degree in Veterinary Medicine

Faculty: Faculty of Veterinary Medicine and Experimental Sciences

Code: 1260207 **Name:** Histopathology and General Pathological Anatomy

Credits: 6,00 **ECTS Year:** 2 **Semester:** 1

Module: Module of Clinical Sciences and Animal Health

Subject Matter: Alterations in Structure and Function, and Fundamentals of Diagnosis **Type:**

Compulsory

Department: Animal Production and Public Health

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:

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Module organization

Module of Clinical Sciences and Animal Health

Subject Matter	ECTS	Subject	ECTS	Year/semester
Alterations in Structure and Function, and Fundamentals of Diagnosis	36,00	Clinical diagnostic techniques I (Clinical Propedeutics)	6,00	3/1
		Clinical Diagnostic Techniques II (Imaging Diagnosis)	6,00	3/1
		Histopathology and General Pathological Anatomy	6,00	2/1
		Physiopathology and general integrated Pathology I	6,00	2/1
		Physiopathology and general integrated Pathology II	6,00	2/2
		Special pathological anatomy	6,00	2/2
Pharmacology and Therapeutics	12,00	Pharmacology and Toxicology	6,00	3/1
		Pharmacotherapy, preventive medicine and veterinary hygiene	6,00	5/1
Clinical Sciences and Animal Health	60,00	Clinic and health in equines	6,00	3/2
		Clinic and health in water animals	6,00	5/1
		Clinic and health in wild and exotic animals	6,00	3/2

Clinical Sciences and Animal Health	Clinic and health on the farm I	6,00	4/1
	Clinic and health on the farm II	6,00	4/2
	Epidemiology	6,00	3/1
	Pet Clinic	6,00	3/2
	Reproduction and Obstetrics	6,00	3/1
	Veterinary Surgery I	6,00	3/2
	Veterinary Surgery II	6,00	4/1

Recommended knowledge

To have completed the course Cytology and Animal Histology.

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

R1	The student is able to differentiate organs with a pathology from those that are healthy or with post-mortem alterations.
R2	The student uses specific terminology to name the different lesions.
R3	The student knows the main lesions observed in the most relevant domestic species.
R4	The student is able to link the causal agent and the pathogenesis of a given disease with its consequences.
R5	The student knows the necropsy technique and the sampling procedure for histopathology.
R6	The student is able to recognize lesions both macroscopically and microscopically.
R7	The student is able to write an anatomopathological report.
R8	The student searches bibliographic information from different sources and knows how to analyse it with a critical and constructive spirit.
R9	The student is able to differentiate cells, tissues or organs with a pathology from those that are healthy or with post-mortem alterations.

Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB2	Capacity to apply knowledge to work or occupation in a professional way and have the competences that are proved by preparing and arguing topics and problem-solving in their specific field of study.				x
CB3	Capacity to gather and interpret relevant data usually within their specific field of study and capacity to make judgments that include reflection on relevant social, scientific or ethical issues.			x	
CB4	Capacity to communicate information, ideas, problems and solutions at specialist and non-specialist levels.				x

GENERAL		Weighting			
		1	2	3	4
CG2	Understanding and applying prevention, diagnosis and individual or collective treatment , and control of animal diseases, individually or in groups, with special attention to zoonoses.			x	
CG6	Developing professional practice, acquiring skills related to teamwork, with an efficient use of resources and quality management.				x
CG7	Identifying emerging risks in all areas of the veterinary profession.				x

SPECIFIC		Weighting			
		1	2	3	4
E22	Knowing and applying principles and bases of nosology.	x			
E23	Knowing and applying principles and bases of the description and pathogenesis of general alterations of the structure and function of cells, tissues, organs and systems.				x

E24	Knowing and applying methods and procedures of clinical examination, additional diagnostic techniques and their interpretation.	x			
E25	Knowing and applying imaging diagnostic and radiation biology.	x			
E26	Knowing and applying necropsy.				x
E27	Knowing and applying recognition and diagnosis of different types of injuries and their association with pathological processes.				x
E29	Knowing and applying diagnosis.				x

TRANSVERSAL		Weighting			
		1	2	3	4
T1	Capacity of analysis, synthesis, implementation of knowledge for problem-solving and decision-making.			x	
T2	Understanding and applying the scientific method to professional practice including evidence-based medicine.			x	
T3	Basic knowledge of the veterinary profession: legal, economic, administrative, planning and time management issues and the veterinarians' society together with the importance of monitoring quality, standardization and protocols of veterinary practice.			x	
T4	Mastering fluency in oral and written mother tongue communication, listening and responding effectively using a language appropriate to audience and context.				x
T6	Using information technology to communicate, share, search for, collect, analyze and manage information, especially related to the veterinarian practice.				x
T8	Efficient and effective work, both independently and as a member of a multidisciplinary team or unit, showing respect, appreciation and sensitivity to the work of others.				x
T10	Ability to learn, to research, and to be aware of the need to keep knowledge updated, and attending training programs.			x	

Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R2, R3, R4, R6, R9	40,00%	Written assessment of acquired knowledge and skills. The test may consist of a series of open-ended questions or multiple-choice questions about the theoretical contents of the module and/or practical exercises (problem-solving).
R2, R3, R4, R5, R6, R7, R8, R9	10,00%	Evaluation of the use of the practical lessons in the classroom, of problems or computer science, seminars and tutorials, by means of participation, computer-supported problem solving and the elaboration of the corresponding reports.
R2, R3, R4, R5, R6, R7, R9	15,00%	Evaluation of practical work in a clinic through which the student must demonstrate the competences acquired and the ability to use them to solve the different situations and problems that arise in a clinic; this assessment may involve one of the following methods, or a combination of several of them: a written individual test, the individual or group performance of a clinical experience, the delivery of an individual or group report on the work carried out in the laboratory.
R2, R3, R4, R6, R8, R9	15,00%	Evaluation of group work through a system of continuous assessment throughout the course based on the delivery of assignments the objectives and content of which will be proposed by the teacher.
R2, R3, R4, R6, R8, R9	20,00%	Evaluation of activities in which the student must do some research individually and structure information related to each of the topics through a system of continuous assessment throughout the course based on the delivery of papers, the objectives and contents of which will be proposed by the teacher.

Observations

***Written assessment of acquired skills and knowledge**. All students must obtain a grade equal to or higher than 5 in the test in order to pass the course. In the event of failure to do so, the grade corresponding to the other items will be kept for the following two calls of the following academic year. The written test represents 40% of the final mark. A theoretical knowledge test will be conducted including multiple choice and open-ended questions.
Attendance to practical sessions is compulsory. During the practical sessions the teacher will check attendance and student attitude. The factors considered include attention, participation level, and the degree of interest shown during the practice, which will correspond to 10% of the final grade of the course.
****Assessment of practical sessions in a clinic**. All students must obtain a grade equal to or higher than 5 in the test in order to pass the course. In the event of failure to do so, the grade corresponding to the other items will be kept for the following two calls of the following academic year. The practical assessment will include any aspect related to the practice carried out during the academic year and will consist of an exam, where the student must show the competences acquired in the course. The assessment of the practical activities accounts for 15% of the final grade.
The evaluation of group work accounts for 15% of the final grade. The students, divided into groups of 2 to 5 people, will present an anatomopathological report at the end of each necropsy practice. The teacher will assess the presentation of the report as well as the involvement of all members of the group. Submitting work generated entirely or mainly by AI is prohibited. This act will be considered similar to plagiarism, the use of illicit means, or impersonation, and will be sanctioned according to current academic disciplinary rules. There is no minimum score requirement for this item, and a second submission to raise the grade is not available.
The evaluation of the individual assignment accounts for 20% of the final grade. The student must present a detailed study on the necropsy technique of an animal species studied during the practical sessions of the course.
Global assessment:
This course is not eligible for single evaluation. According to the general evaluation and qualification regulations, the preferred evaluation system will be continuous evaluation.
For the final grade, the results of the different evaluation activities are weighted. In order to pass the course, it will be necessary to obtain, as a minimum, a grade equal to or higher than 5 points out of 10 in the section marked with an asterisk (*,**). If the minimum grade is not obtained in these sections but other evaluation items have been passed, these passed grades will be kept for the two calls of the following year, given that they have passed the required competencies.
Those students who, for a justified reason (see article 10 of the regulations in force https://www.ucv.es/documentos/normativa/documento11.html), cannot attend the evaluation of the course on the official exam date, they must request an application from the Secretary of the Faculty of Veterinary Medicine and Experimental Sciences may undergo the final evaluation of the course by means of an oral or written examination according to the teacher's criteria.
In all the written evaluations that are carried out in the course spelling will be taken into account, so

that for each spelling mistake (including accents marks) 0.1 points will be subtracted from the final grade up to a maximum of 2 points.
The use of artificial intelligence (AI)-based tools is subject to the discretion of the teacher, who may establish specific limits or conditions depending on the training or assessment activity (see evaluation of the individual assignmen).

MENTION OF DISTINCTION:
In accordance with the regulations governing the assessment and grading of subjects in force at UCV, the distinction of "Matrícula de Honor" (Honours with Distinction) may be awarded to students who have achieved a grade of 9.0 or higher. The number of "Matrículas de Honor" (Honours with Distinction) may not exceed five percent of the students enrolled in the group for the corresponding academic year, unless the number of enrolled students is fewer than 20, in which case a single "Matrícula de Honor" (Honours with 9 Distinction) may be awarded. Exceptionally, these distinctions may be assigned globally across different groups of the same subject. Nevertheless, the total number of distinctions awarded will be the same as if they were assigned by group, but they may be distributed among all students based on a common criterion, regardless of the group to which they belong. The criteria for awarding "Matrícula de Honor" (Honours with Distinction) will be determined according to the guidelines stipulated by the professor responsible for the course, as detailed in the "Observations" section of the evaluation system in the course guide.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M1 On-site training activity aimed primarily at acquiring knowledge acquisition skills. It is characterised by the fact that students are spoken to. Also called master class or exposition, it refers to the oral presentation made by the teacher, (with the support of blackboard, a computer and a projector for the display of texts, graphs, etc.), in front of a group of students. They are expository, explanatory or demonstrative sessions of contents. The size of the group is determined by the limit or physical capacity of the classroom; therefore, it is a single group.

M2 On-site training activity aimed primarily at obtaining knowledge application and research skills. Knowledge is built through interaction and activities. The activity consists of supervised monographic sessions with shared participation (teachers, students, experts). The size of the group is variable, from one large group to various small groups, with a minimum of 6 students to ensure interaction. The evaluation will be based on follow-up records kept by the teacher. Participation and the development of the capacity to problematize should be taken into account.

M4 On-site training activity in groups that takes place in the classroom. It includes working with documents and formulating ideas without handling animals, organs, objects, products, or corpses (e.g., work with articles or documents, clinical case studies, diagnostic analyses, etc.). It would correspond to "Animal-free supervised practical work", type e1, from the European evaluation of EAEVE. The size of the group is variable, in a range of 10 to 20 students.

M5 On-site training activity in groups that takes place in the Computer Lab where the computer is used as support for learning. It includes work with computer models, specific software, Web queries, etc. It would correspond to "Animal-free supervised practical work", type e1, from the European evaluation of EAEVE. The size of the group is variable, in a range of 10 to 20 students.

M6 On-site training activity in groups carried out in the laboratory. It includes the sessions where the students develop laboratory experiments, make dissections or use the microscopes for the study of histological or histopathological samples actively and autonomously, under the supervision of the professor. It also includes work with healthy animals, objects, products, corpses (e.g., animal handling, bacteriological practices, physiology or biochemistry, meat inspection, etc.). It would correspond to the "Supervised practical non-clinical animal work" type e2 of the European evaluation of EAEVE. The size of the group is variable, in a range of 10 to 20 students.

M7 On-site training activity that is defined as the clinical practical work developed in the Veterinary Clinical Hospital or clinical centres ascribed to the University, as well as itinerant clinical practices, mainly with ruminants, equids, pigs, birds and aquatic animals. Also included are necropsies, surgical workshops and training in clinical examination techniques or diagnosis with healthy patients. In these practical sessions the student will always work with animals, which can be healthy (e.g. propaedeutic or obstetrics) or clinical cases (individual or collective), including a protocol or work scheme, being supervised by a teacher and assuming the provision of a service. This type of training corresponds to type e3 of the EAEVE European evaluation called "Clinical Training" (strickly hands-on)". The size of the group will be 5 students or fewer.

M8 A set of on-site training activities carried out by the teacher to provide personalised attention to the student or in small groups with the aim of reviewing and discussing the materials and topics presented in classes, seminars, readings, carrying out projects, etc. The aim is to ensure a truly comprehensive education of the student rather than a mere transfer of information. It is, therefore, a personalized assistance relationship in which the tutor assists, facilitates and guides one or more students in the learning process.

M9 Set of processes that attempt to evaluate the learning outcomes of students expressed in terms of acquired knowledge, capacities, skills or abilities developed and manifested attitudes. It covers a wide range of activities that can be developed for students to demonstrate their training (e.g. written, oral and practical tests, projects or assignments). It also includes the Official Calls.

M10 Autonomous training activity, including activities and coursework, bibliographic searches. The results obtained from unsupervised group and teamwork will be evaluated, with particular attention paid at the time of evaluation to the acquisition of specific knowledge development skills through group work.

M11 Autonomous training activities related to personal study, or the preparation of individual course assignments. The individual preparation of readings, essays, problem solving, papers, reports, etc. will be evaluated through presentations or submissions during theoretical classes, practical classes, seminars and/or tutorials. The evaluation of the submitted papers will consider the structure of the paper, the quality of the documentation, originality, spelling and presentation.

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical lessons (TL) M1	R2, R3, R4, R6, R8, R9	56,00	2,24
Seminars (S) M2	R2, R3, R4, R6, R9	10,00	0,40
Clinical Practice (CP) M7	R2, R3, R4, R5, R6, R7, R8, R9	20,00	0,80
Tutorial M8	R2, R3, R4, R5, R6, R7, R8, R9	2,00	0,08
Evaluation (Ev) M9	R2, R3, R4, R5, R6, R7, R8, R9	2,00	0,08
TOTAL		**90,00**	**3,60**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group work M10		5,00	0,20
Individual work M11	R2, R3, R4, R5, R6, R7, R8, R9	55,00	2,20
TOTAL		**60,00**	**2,40**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
INTRODUCTION TO HISTOPATHOLOGY AND GENERAL ANATOMIC PATHOLOGY.	**INTRODUCTION TO HISTOPATHOLOGY AND GENERAL ANATOMIC PATHOLOGY**. Historical context of Anatomic Pathology. Concepts of Necropsy, Biopsy and Cytology. Concepts of Morphological Diagnosis, Etiological Diagnosis, Name of the disease and Pathogenesis.
SECTION 1.- FOUNDATIONS OF VETERINARY PATHOLOGY	**CHAPTER 1. CASE SUBMISSION PROTOCOL**. Biopsy preservation. Identification of surgical margins. Submission of biopsies and histological processing. Request and sending of necropsy cases. Supplementary tests. **CHAPTER 2. ARTIFACTS AND POSTMORTEM CHANGES**. Concept of postmortem changes. Cadaveric rigidity. Cadaveric hypostasis. Cadaveric coldness. Color changes. Barbiturate crystal deposits. Other postmortem changes. **CHAPTER 3. MACROSCOPIC DESCRIPTION OF LESIONS**. Identification and anatomical localization of lesions. Distribution pattern. Color. Shape. Consistency. Size or volume. Contour and sectioned surface.
SECTION 2.- CELLULAR PATHOLOGY.	**CHAPTER 4. ADAPTIVE CHANGES AND CELL DIFFERENTIATION**. Hypertrophy. Hyperplasia. Atrophy. Metaplasia. Dysplasia. Hypoplasia. Aplasia. Agenesis. **CHAPTER 5. CELL DEATH**. Causes and mechanisms of Cell injury. Hydropic degeneration. Apoptosis. Necrosis. Main types of necrosis. Evolution and sequelae of necrosis. New terms of Cell death. **CHAPTER 6. DEPOSITS AND PATHOLOGICAL CALCIFICATION**. Lipidosis. Glycogenosis. Hemosiderosis. Anthracosis. Amyloidosis. Gout. Jaundice. Dystrophic and metastatic calcification.

SECTION 3.- HEMODINAMIC PATHOLOGY.	**CHAPTER 7. EDEMA**. Starling's balance. Increased hydrostatic pressure. Decreased oncotic pressure. Increased vascular permeability. Obstruction of lymphatic drainage. Diagnosis and nomenclature. **CHAPTER 8. HYPEREMIA AND CONGESTION**. Acute local active hyperemia. Acute local passive congestion. Chronic local passive congestion. Chronic generalized passive congestion. **CHAPTER 9. HEMOSTASIS AND BLEEDING**. Basic concepts of Hemostasis. Acute and chronic hemorrhage. Main causes of hemorrhage. Diagnosis and nomenclature. **CHAPTER 10. THROMBOSIS AND DIC**. Virchow's triad. Main causes of thrombosis. Types of thrombi. Evolution and resolution of thrombosis. Disseminated intravascular coagulation (DIC). **CHAPTER 11. EMBOLISM**. Fat embolism. Gas embolism. Bacterial embolism. Parasitic embolism. Neoplastic embolism. Thromboembolism. Other types of embolism. **CHAPTER 12. INFARCT AND SHOCK**. Infarct concept. Types of infarcts. Shock. Types of shock. Phases and clinical evolution of shock.
SECTION 4.- INFLAMMATION AND TISSUE REPAIR	**CHAPTER 13. BASIC CONCEPTS AND NOMENCLATURE**. Functions and components of Inflammation. Clinical evolution of inflammation. Types of inflammation. Diagnosis and nomenclature. **CHAPTER 14. ACUTE INFLAMMATION AND MEDIATORS OF INFLAMMATION**. Vascular changes. Leukocyte recruitment. Phagocytosis and elimination of the causative agent. Finalization of acute inflammation. Inflammation mediators. Morphological patterns of acute inflammation. **CHAPTER 15. CHRONIC INFLAMMATION AND SYSTEMIC EFFECTS**. Causes of chronic inflammation. Components of chronic inflammation. Morphological pattern of chronic inflammation. Systemic effects of inflammation. **CHAPTER 16. TISSUE REPAIR**. Tissue regeneration. Scarring and fibrosis. Tissue repair abnormalities.

SECTION 5.- NEOPLASMS AND TUMOR BIOLOGY.	**CHAPTER 17. BASIC CONCEPTS AND NOMENCLATURE**. Basic concepts of Neoplasms. Microscopic criteria of malignancy. Identification of mitosis. Diagnosis and nomenclature. **CHAPTER 18. TUMOR DEVELOPMENT, METASTASIS AND STAGING**. Proliferation and Cell cycle. Neoplastic development. Tumor metastasis. Clinical staging of Cancer. **CHAPTER 19. MOLECULAR BASES AND CARCINOGENESIS**. Molecular bases of neoplasms. Carcinogenesis. Examples of carcinogenesis in Veterinary Medicine. **CHAPTER 20. SYSTEMIC EFFECTS AND PARANEOPLASTIC SYNDROMES**. Direct and systemic effects of neoplasms. Paraneoplastic syndrome concept. Main paraneoplastic syndromes.

Organization of the practical activities:

	Content	Place	Hours
PR1.	HISTOPATHOLOGY SEMINARS	Laboratory	10,00
PR2.	NECROPSY AND ITS TECHNIQUE. SAMPLING.	Hospital	12,00
PR3.	MACROSCOPIC DEMONSTRATION IN SLAUGHTERHOUSE VISCERA	Hospital	2,00
PR4.	EMERGENCY NECROPSIES	Hospital	4,00

Temporary organization of learning:

Block of content	Number of sessions	Hours
INTRODUCTION TO HISTOPATHOLOGY AND GENERAL ANATOMIC PATHOLOGY.	1,00	2,00
SECTION 1.- FOUNDATIONS OF VETERINARY PATHOLOGY	4,00	8,00
SECTION 2.- CELLULAR PATHOLOGY.	10,00	20,00
SECTION 3.- HEMODINAMIC PATHOLOGY.	10,00	20,00
SECTION 4.- INFLAMMATION AND TISSUE REPAIR	10,00	20,00
SECTION 5.- NEOPLASMS AND TUMOR BIOLOGY.	10,00	20,00

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