



## Information about the subject

**Degree:** Bachelor of Science Degree in Veterinary Medicine

**Faculty:** Faculty of Veterinary Medicine and Experimental Sciences

**Code:** 1260307 **Name:** Pharmacotherapy, preventive medicine and veterinary hygiene

**Credits:** 6,00 **ECTS Year:** 5 **Semester:** 1

**Module:** Module of Clinical Sciences and Animal Health

**Subject Matter:** Pharmacology and Therapeutics **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

Knowledge of Biochemistry, Physiology, Pathology, Pharmacology and Toxicology.

## 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 Solving and explaining pharmacokinetic and pharmacodynamic aspects of drugs based on previously acquired physiological knowledge.
- R2 Knowing all the therapeutic groups and their possible applications in the professional context.
- R3 Knowing and identifying possible adverse reactions and pharmacological interactions derived from the administration of drugs.
- R4 Knowing the strategies and measures of prophylaxis and prevention to be applied for the control of infectious and parasitic diseases.
- R5 Applying the theoretical and practical knowledge acquired to problem solving in the therapeutic context.



## 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
CG0	Capacity to speak well in public.			X	
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
CG5	Understanding and applying laws, regulations and administrative provisions in all areas of the veterinary profession and public health, understanding the ethical implications of health in a changing global context.				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
E28	Knowing and applying the clinical study of patients and medical, surgical or hygienic-dietary treatments required, as well as sporadic diseases affecting groups.				X
E35	Knowing and applying the general pharmacological bases and study of different types of drugs.				X
E36	Knowing and applying pharmacotherapy.				X
E42	Knowing and applying the promotion of collective health in animals, including wildlife, in order to maximize the economic performance in a social, ethical and healthy way.				X
E43	Knowing and applying technical measures and regulations for the prevention, control and eradication of animal diseases.				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



T9	Keeping an ethical behaviour in the exercise of given responsibilities toward the profession and society.				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
R1, R2, R3, R4, R5	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).
R4, R5	15,00%	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.
R1, R2, R3, R4, R5	10,00%	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, R5	20,00%	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.
R1, R2, R3, R4, R5	15,00%	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

The average grade of the written evaluation of the acquired knowledge and skills, of the evaluation of the exploitation of the practical sessions and of the evaluation of the group assignments must be equal to or higher than 50% each, in order to be averaged together with the rest of the items. The evaluation of seminars and practical sessions will be carried out by means of an examination on the same day as the written test corresponding to the evaluation of the theoretical contents and/or in the same practical session. Attendance to the practical sessions and seminars will be compulsory. The dates will be communicated to the students with sufficient time in advance. It will not be possible to repeat the practice or seminar outside the established calendar. The presentation and evaluation of the guided projects (autonomous and team work) accounts for 15% of the final grade. The students, divided into groups of approximately 5 people, will present a scientific paper related to the subject. The teacher will value the presentation and the involvement of all the members of the group. 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 50 points out of 100 in the final grade of the course. For those students who, for various justified reasons, do not attend the evaluation of some of the parts on the official date of the calls, the extraordinary evaluation may be carried out by means of an oral or written examination at the discretion of the teacher. Exam review: after the publication of the grades, the student will have the examination review schedules published on the intranet to review their exam, unless specifically indicated otherwise by the faculty, no exams will be shown outside these hours.

## MENTION OF DISTINCTION:

According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

## 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.
- M3 On-site group-work training activity oriented toward problem solving under the supervision of a teacher. 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, to differentiate it from a master class.
- 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.



- 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	44,00	1,76
Seminars (S) M2	R2, R3, R4	4,00	0,16
Problem-solving Practice (PSP) M3	R1, R2, R5	2,00	0,08
In-Classroom Practice (ICP) M4	R1, R2, R3, R4, R5	4,00	0,16
Clinical Practice (CP) M2	R1, R2, R3, R4, R5	2,00	0,08
Tutorial M8	R1, R2, R3, R4, R5	2,00	0,08
Evaluation (Ev) M9	R1, R2, R3, R4, R5	2,00	0,08
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>

## LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group work M10	R1, R2, R3, R4, R5	20,00	0,80
Individual work M11	R1, R2, R3, R4, R5	70,00	2,80
<b>TOTAL</b>		<b>90,00</b>	<b>3,60</b>



## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block

Contents



## PHARMACOTHERAPY

### 1. INTRODUCTION AND GENERAL ASPECTS.

Physical and surgical therapy. Drug therapy. Types of treatments (etiological, symptomatic, etc.). Economic aspects of veterinary therapy.

### 2. PRESCRIPTION, VETERINARY PRESCRIPTION AND USE OF VADE MECUM.

Veterinary prescription. Electronic prescription. Use of pharmacotherapy databases.

### 2. PAIN AND INFLAMMATION THERAPY.

Nonsteroidal anti-inflammatory drugs. Antiarthritics and anti-rheumatoids. Topical anti-inflammatory drugs.

Anti-inflammatory steroids: Glucocorticoids. ACTH.

Mineralcorticoids. Antihistamines.

### 3. CIRCULATORY SYSTEM THERAPY.

Cardiovascular therapy. Contractibility and heart rate: heart failure and dysrhythmias. Blood pressure control: treatment of hypertension and hypotension. Hydric and electrolytic balance therapeutics. Hypovolemic shock. Dehydration.

Anemias. Transfusions. Plasma substitutes and expanders.

Oral and parenteral fluid therapy. Anticoagulant and Antithrombotic Therapy. Haemorrhage therapy.

### 4. RENAL APPARATUS THERAPY

Diuretics. Kidney failure. Nephritis, pyelonephritis and glomerulonephritis. Cystitis. Retention and incontinence. Urolithiasis.

### 5. RESPIRATORY SYSTEM THERAPY.

Allergic and inflammatory disorder therapy. COPD treatment. Pneumonia, oedema and pulmonary emphysema. Antitussives therapy. Respiratory stimulants. Nasal decongestants. Mucolytics.

### 6. DIGESTIVE SYSTEM THERAPY.

Gastritis and ulcer therapy. Vomiting therapy. Therapy of diarrhea syndrome and constipation. Equine colic therapy. Alterations in ruminants: Ruminal acidosis and tympanism (ruminatory, antifermentation and antifoaming); abomasal impaction.

Liver and biliary secretion therapy: hepatoprotectors, choleretics and cholagogues. Acute and chronic liver failure.

Hepatic encephalopathy. Exocrine pancreatic secretion therapy: simple indigestion (digestive stimulants), pancreatitis and chronic pancreatic insufficiency.

Therapy of metabolic diseases of ruminants. Ketosis.



## 7. ENDOCRINE SYSTEM DISEASES THERAPY.

Hyperthyroidism and hypothyroidism (thyroid and antithyroid hormones). Hypophysis Hormones: Somatotropin, Adrenocorticotrophic hormone. Neurohypophysis: Antidiuretic hormone (vasopressin), Oxytocin.

Hormones that act on reproduction. Reproductive system diseases therapy.

## 8. CUTANEOUS-OCULAR AND OTICAL THERAPY.

Dermatological therapy. Cutaneous and astringent protectors. Irritants: rubefacients, caustic. Keratoplastics, keratolytics, antimicrobials, glucocorticoids.

Ocular Therapy. Mydriatics and cycloplegics. Glaucoma treatment. Treatment of dry keratoconjunctivitis. Blepharitis, conjunctivitis, keratitis, corneal wounds and ulcers, iritis.

Otic therapy. Treatment of otitis. Anti-infective drugs, cleansing lotions and sebolytics.

9. NERVOUS SYSTEM THERAPY. Therapeutics in behavioral disorders. Tranquilizers. Epilepsy therapy. Urinary incontinence therapy.

## 10. RATIONAL USE OF DRUGS USED IN THE TREATMENT OF INFECTIOUS AND PARASITIC DISEASES.

## PREVENTIVE MEDICINE AND VETERINARY HYGIENE

1. Preventive medicine: definition and objectives.

Biosafety. Livestock health defence groups (LHDG).

2. Preventive medicine in different species: health plans. Ruminants, equids, pigs, aviculture, apiculture, rabbit breeding and pets.

3. Health police and Veterinary Public Health. Organisms related to Animal Health. Traceability and sanitary safety of animal trade (SITRAN, TRACES, CEXGAN, etc). Epidemiological Surveillance. Veterinary Health Alert Network (SASV). International Health Code.

4. Health status of livestock in Spain. National plans for monitoring, control and eradication of animal diseases.

5. Emerging animal diseases and zoonoses.



## Organization of the practical activities:

	Content	Place	Hours
PR1.	SEMINAR PHARMACOTHERAPY IN EXOTIC ANIMALS	Lecture room	2,00
PR2.	SEMINAR AEMPS	Lecture room	2,00
PR3.	CASE STUDIES PHARMACOTHERAPY	Lecture room	2,00
PR4.	PRACTICE PREVENTIVE MEDICINE IN LIVESTOCK SPECIES	Technical visit	2,00
PR5.	VISIT TO HIPRA LABORATORIES	Technical visit	2,00

## Temporary organization of learning:

Block of content	Number of sessions	Hours
PHARMACOTHERAPY	15,00	30,00
PREVENTIVE MEDICINE AND VETERINARY HYGIENE	15,00	30,00



## References

- JIM E. RIVIERE, MARK G. PAPICH. Veterinary Pharmacology and Therapeutics. 10th Edition. Wiley-Blackwell. 2017.
- ADAMS, H. R. Farmacología y Terapéutica Veterinaria. 2ª ed. Edimar Editores. 2003.
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- RANG, H.P. & DALE, M.M. Farmacología. 6ª ed. Madrid. Churchill Livingstone. 2008.
- SCOTT A. WALDMAN, ANDRE TERZIC. Farmacología y terapéutica. Principios para la práctica. Mexico, Manual moderno, 2010.
- SUMANO. Farmacología veterinaria. Madrid. Mac Graw-Hill Interamericana. 2006
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- VELAZQUEZ, B. Farmacología. 18ª ed. Ed. Médica Panamericana. Madrid. 2009.