1. OVERVIEW

Subject Area	Foundations of Pharmacology and Therapeutics
Degree	Bachelor's Degree in Veterinary Medicine
School/Faculty	Biomedical and Health Sciences
Year	Second
ECTS	9 ECTS
Type	Compulsory
Language(s)	Spanish
Delivery Mode	On-campus
Semester	First semester

2. INTRODUCTION

Foundations of Pharmacology and Therapeutics is a core subject area worth 9 ECTS, taught in the first semester of the second year of the Bachelor's Degree in Veterinary Medicine. It is part of the broader subject area of Foundations of Diagnostics and Therapeutics (15 ECTS), together with the subject area Introduction to Clinical Veterinary Practice (6 ECTS).

The aim of this subject area is to understand the general principles of pharmacology and learn about the primary drugs used in veterinary medicine. This knowledge is essential for carrying out future work as a veterinary professional. In order to achieve this overall aim, the subject area is divided into four units dealing with the foundations of pharmacology and therapeutics, pharmacokinetics, pharmacodynamics and the primary drug classes used for animals.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by their acronym in Spanish):

- CB1: Demonstrate knowledge and understanding of an area of study, building on the foundation of general secondary school education. At this level, and perhaps with the support of more advanced textbooks, students should be able to demonstrate awareness of the latest developments in their field of study (Knowledge Acquisition).

- CB5: To develop the learning skills needed to undertake further studies with a high degree of autonomy (Autonomous Learning).

General skills (CG, by their acronym in Spanish):

- CG2: Prevent, diagnose and treat animal diseases, particularly zoonoses, both individually and as part of a team.

Cross-curricular skills (CT, by their acronym in Spanish):

- CT2: Independent learning. Employ appropriate strategies needed to search for, analyse, evaluate and manage information from different sources, and to learn and put into practice what has been learnt independently.

- CT3: Teamwork: Collaborate actively with other people, departments and/or organisations to reach common goals, value and incorporate contributions from the rest of the group members and create a good working environment.

Skills Specific to the Degree:

- CE5: Knowledge and application of:
  e) general foundations of pharmacology and the study of different types of drugs.

- CE6: Knowledge and application of:
  h) pharmacotherapy.
  i) identification and study of natural and synthetic toxins
  j) animal and environmental toxicology.

Learning outcomes (RA, by their acronym in Spanish):

- RA1: Identify the basic principles that govern veterinary pharmacology.

- RA2: Sort drugs into their different drug classes, in order to later use them as therapeutic agents.

- RA3: Define the mechanism of action of each drug class.

- RA4: Describe the pharmacokinetic characteristics of the main therapeutic agents in veterinary medicine.

- RA5: Study drug indications and specific characteristics in different animal species.

- RA6: Describe the animal and environmental toxicology of drug use in veterinary practice.

The following table shows how the skills developed in the subject area relate to the intended learning outcomes:

Skills (CE)	Learning outcomes (RA, by their acronym in Spanish)
CE5a	RA5
CE5e	RA1, RA2, RA3, RA4
CE6a	RA5
CE6b	RA5
CE6c	RA5
CE6d	RA5
CE6h	RA2, RA5
CE6i	RA6
CE6j	RA6

4. CONTENT

The general contents of this subject area are as follows:

- General Principles of Pharmacokinetics and Pharmacodynamics.
- Basic Outline of the Primary Drug Classes.
- Dosage Forms and Their Pharmacokinetic Applications.
- Mechanisms of Action.
- Pharmacological Effects.
- Therapeutic Applications.
- Toxic Effects of Administered Therapies.
- Introduction to Applied Toxicology.

In order to deliver this content effectively, the subject area is divided into four units that will be taught by means of lectures ("Topic, T") and practicals (Labs, Workshops "Practical, P").

UNIT I: Introduction.

UNIT II: Pharmacokinetics.

UNIT III: Pharmacodynamics.

UNIT IV: Primary Drug Classes Used in Veterinary Medicine.

5. TEACHING/LEARNING METHODS (MD, by their Spanish acronym)

The types of teaching/learning methods are as follows:

- MD1: Lecture / Web conference.
- MD2: Case studies.
- MD5: Collaborative learning.
- MD6: Learning through workshops/labs.
- MD7: Simulation environments.
- MD8: Work placement: case studies.

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

Learning activity	Number of total hours	Number of hours on campus
AF1: Master lectures	61	61
AF2: Group work (seminars, forums, debates and talks)	7	2
AF3: Case studies and problem-solving	16	8
AF4: Oral presentations	2	2
AF5: Independent working	99	0

AF6: Workshops and/or labs and/or simulation	14	14
AF7: Student work placement	0	0
AF8: Drafting reports or concept maps	20	0
AF10: Tutorials	4	2
AF11: Assessment tests	2	2
TOTAL	**225**	**91**

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the course, are as follows:

SE1: On-campus theory exams: 60%
SE4: Case study/problem: 15%
SE5: Oral presentations: 10%
SE7: Performance observation: 15%

Assessment system	Assessment criteria	Weighting (%)
SE1a. Partial Theory Exam 1 (November)	Answer the questions correctly	30
SE1b. Partial Theory Exam 2 (January)	Answer the questions correctly	30
SE4. Practical Exams: Problem Solving and Case Studies	Demonstrate acquisition of practical skills Solve problems in the correct manner Answer the questions correctly	15
SE5. Oral presentation	Deliver a presentation correctly, demonstrating good public speaking skills and using substantiated scientific data	10
SE7. Performance	Demonstrate acquisition of practical skills Solve problems in the correct manner Answer the questions correctly	15

8. BIBLIOGRAPHY

The works of reference for following up this subject area are:

- Botana, L.M. (2016). Farmacología Veterinaria. Fundamentos y aplicaciones terapéuticas. Editorial Médica Panamericana.
- Brenner, G.M., Stevens C.W. (2019). Farmacología básica. 5th Ed. Elsevier. Barcelona
- Brunton L.L., Chabner, B., Chabner, B.A., Knollman, B. (2018). Goodman & Gilman's. The Pharmacological Basis of Therapeutics. 13th Ed. McGraw-Hill. EE.UU.
- Gupta, R.C. (2018). Basic and clinical principles. 3rd Ed. Veterinary Toxicology. Elsevier. EEUU.
- Ritter, J, Flower, R., Henderson, G., Loke, Y.K., MacEwan, D., Rang, H. (2019). Rang & Dale's Pharmacology. 9th Ed. Elsevier. Barcelona.
- Riviere, J.E. (2011). Comparative Pharmacokinetics: Principles, Techniques and Applications. 2nd Ed. Wiley-Blackwell. EE.UU
- Riviere, J.E., Papich, M.G. (2018). Veterinary Pharmacology and Therapeutics. 10th Ed. Wiley-Blackwell. EE.UU

The recommended bibliography is indicated below:

- https://www.msdvetmanual.com/ o https://www.merckvetmanual.com/
- https://www.aemps.gob.es/