

## 28420 - Pharmacology and Drug Therapy

### Información del Plan Docente

Academic Year	2017/18
Faculty / School	105 - Facultad de Veterinaria
Degree	451 - Degree in Veterinary Science
ECTS	9.0
Year	3
Semester	Annual
Subject Type	Compulsory
Module	---

### **1.General information**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

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

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

The course is structured in two general topics: (a) Pharmacy and Pharmacology and (b) Pharmacotherapy, developed according to the following criteria:

a. 90 classroom hours:

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60 hours of lectures.  
16 hours of practical laboratory classes.  
5 hours of seminars.  
7 hours of special therapeutic practices.  
2 hours of supervised work.

b. 135 hours of independent study time:

100 hours of study regarding lectures.  
10 hours spent for the section on laboratory practice  
17 hours spent for the therapeutic supervised practice.  
4 hours devoted to evaluation.

Lectures are taught to be held in the classroom with students divided in two groups.  
Four seminars will be organized (one hour for session) and will be based on clinical cases.

The laboratory work will consist of four sessions: (a) routes of administration and dose calculation, (b) pharmacokinetic and dosage forms, (c) pharmacodynamics I and (d) Pharmacodynamics II. They will be conducted in the laboratory of Pharmacology, in groups programmed by the center, within the first semester of the academic year. Initially, an explanation of the session will be done. Subsequently, students will practice under the supervision of teachers. Students will be provided with noteworks and specific materials for the practice. Laboratory dressing and the use of personal protective measures are required by the University.

Special therapeutic practices will be carried out with the approval of the Ethical Committee for Animal Welfare. They will be held throughout the second quarter and will include tutorials in groups of 6 students and the final submission of a written report. The appropriate clinical clothing (sanitary dress) is required.

### 5.2.Learning tasks

Lectures, 60 hours  
Laboratory practical classes, 16 hours  
Seminars, 5 hours  
Special therapeutic practices, 7 hours.  
Supervised work, 2 hours.

### 5.3.Syllabus

The contents of each of these thematic blocks are presented in the program is detailed below:

Program

Lecture topics:

- 1- Introduction to Pharmacology. The concept of Pharmacology, basic principles and its relation with other disciplines.
- 2- Drug transport and passage across membranes. Transport through channels, active transport, facilitated diffusion,

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absorption, aqueous diffusion of water-soluble drugs.

3- Pharmacokinetics I. Absorption and distribution. Routes of administration. The concept of distribution. Binding to plasma and serum proteins. The blood-brain barrier and the placenta. Factors affecting drug distribution. Volume of distribution.

4- Pharmacokinetics II. Drug metabolism. Pharmacological significance of metabolism. Site of biotransformation. Metabolic pathways: synthetic and non-synthetic. Factors affecting drug metabolism: physiological, pathological and pharmacological factors.

5- Pharmacokinetics III. Drug excretion. General mechanisms of excretion and factors affecting drug excretion. Renal excretion. Liver-biliary excretion. Other excretion routes.

6- Pharmacokinetics IV. Compartmental analysis model. Concepts and variables.

7- Mechanism of drug action. Pharmacodynamics concepts. Drug receptors. Drug-receptor relationship. Concepts: Affinity and intrinsic activity. Dose-response curves. Agonist and Antagonist.

8- Drug interactions. Concepts and modifications. Synergy and antagonism. Pharmacodynamic and pharmacokinetic interactions.

9- Toxicity and drug side effects.

10- Gene therapy.

11- Pharmacy. Type of drugs, dosage forms. Bioavailability and bioequivalence.

### PHARMACOLOGY AND CHEMOTHERAPY OF MICROBIAL DISEASES AND PARASITIC INFECTIONS.

12- Introduction. General concepts. Classification and mechanism of action. Bacterial resistance to antimicrobial agents. Selection of an antimicrobial agent and therapy with combined antimicrobial agents. Toxicity and undesirable side effects. Chemotherapy: safe use of drugs in veterinary.

13- Antiseptics and disinfectants. General concepts. Classification. Pharmacological characteristic of the most commonly used antiseptics: alcohols, phenols, detergents, oxidizing agents, chlorhexidine.

NOTE: In each of the following lectures (14-21), will be included: Chemical structure, classification, mechanism of action, spectrum of activity, resistance, pharmacokinetics, toxicity and side effects, interactions and indications.

14- Sulfonamides and diaminopyridines

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15- Antimicrobial drugs affecting bacterial cell wall. I. Beta-lactams antibiotics: penicillins, cephalosporins, monobactam, carbapenems, beta-lactamase inhibitors. II.

16- Antimicrobial drugs that affect the bacterial protein synthesis. I. Aminoglycosides. II Tetracyclines. III. Phenicols. IV. Macrolides, V. Lincosamides.

17- Antimicrobial drugs that inhibit the nucleic acid synthesis. I. Quinolones. II. Nitrofurans. III. Nitroimidazoles., IV Rifamycins.

18- Other antibacterial drugs. Polymyxins, Novobiocin.

19- Antifungal drugs. I. Topical use. II. Systemic use.

20- Anthelmintic drugs. I. Drugs against nematodes. II. Drugs against cestodes. III. Drugs against trematodes.

21- Anticoccidial drugs

### PHARMACOLOGY OF THE NERVOUS SYSTEM

22- Autonomic Nervous System. Neurotransmission. Drugs acting on the autonomic nervous system.

23- Adrenergic Pharmacology: sympathomimetic and sympatholytic drugs.

24- Cholinergic Pharmacology.

25- Autacoids: Histamine, antihistamines. Other autacoids.

26- Central Nervous System stimulant drugs: analeptics.

27- Non-narcotic analgesic drugs.

28- Narcotic analgesic drugs.

29- Local anesthetic drugs.

30- Neuroleptic drugs.

31- Inhaled anesthetic drugs.

32 - General anesthetic drugs: barbiturates, dissociative drugs, steroids drugs and other drugs with application in general anesthesia.

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### PHARMACOLOGY OF ORGANS AND SYSTEMS

33 - Cardiac pharmacology.

34 - Vasodilator and vasoconstrictor drugs.

35- Hemostatic and anticoagulant drugs.

36- Fluid Therapy.

37- Diuretic drugs.

38- Airway pharmacology: antitussive, mucolytic and bronchodilator drugs.

39- Gastric pharmacology.

40- Intestinal pharmacology: laxative and purgative drugs. Protectors. Adsorbents, Astringents. Drugs modulating intestinal activity.

### Hormone pharmacology

41 - Drugs acting on the reproductive system: steroid and protein hormones. Gonadotropins. Uterine muscle relaxant and oxytocics drugs.

42- Hormones affecting metabolism: Thyroid, Parathyroid, insulin and pancreatic hormones.

43- Corticosteroids therapy.

### PRACTICAL PROGRAM

#### A. Laboratory

10 students per group (groups organized by the center):

1. Routes of administration and dose calculation.

2. Pharmacokinetics and dosage forms.

4. Pharmacodynamics. In vitro methods I.

5. Pharmacodynamics. In vitro methods II.

B. Special therapeutic practices.

Laboratory hours, personalized tutoring and supervised work.

#### C. Seminars

1. Hormone Therapy.

2. Cardiovascular Therapy.

3. Fluid Therapy.

4. Pain, sedation and tranquilization.

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### 5.4.Course planning and calendar

Calendar of meetings attendance and presentation of works: The dates and key points of the course are described in detail, along with the other subjects in the third course in the Degree of Veterinary Medicine at the website of the Faculty of Veterinary Medicine (<http://veterinaria.unizar.es/gradoveterinaria/>). This information will be updated at the beginning of the academic year.

### 5.5.Bibliography and recommended resources

[BB: Bibliografía básica / BC: Bibliografía complementaria]

- [BB] Antimicrobial therapy in veterinary medicine / edited by Steeve Giguère, John F. Prescott, Patricia M. Dowling . 5th ed. Ames, Iowa : Wiley Blackwell, 2013
- [BB] Farmacología / H. P. Rang ... [et al.]. 8ª ed. Ámsterdam ; Barcelona ; Madrid [etc.] : Elsevier, cop. 2016
- [BB] Hsu, Walter H.. Handbook of veterinary pharmacology / Walter H. Hsu . Ames, Iowa : Wiley-Blackwell, 2008
- [BB] Lorenzo Velázquez, Benigno. Farmacología básica y clínica / Velázquez ; [colaboradores], P. Lorenzo ... [et al.]. 18ª ed., 2ª. reimp. Madrid [etc.] : Editorial Médica Panamericana, 2010
- [BB] Veterinary pharmacology and therapeutics / edited by Jim E. Riviere, Mark G. Papich, H. Richard Adams . 9th ed. Iowa : Iowa State University Press : Wiley-Blackwell, 2009
- [BC] Farmacología veterinaria : fundamentos y aplicaciones terapéuticas / coordinador, Luis Miguel Botana López . Madrid : Editorial Médica Panamericana, D. L. 2015

Listado de URL

- Servicio de Información Veterinaria Internacional [[http://www.ivis.org/content\\_es.asp](http://www.ivis.org/content_es.asp)]