



## Information about the subject

**Degree:** Bachelor of Science Degree in Podiatry

**Faculty:** Faculty of Medicine and Health Sciences

**Code:** 471201 **Name:** Pharmacology

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

**Module:** BASIC TRAINING

**Subject Matter:** PHARMACOLOGY **Type:** Basic Formation

**Field of knowledge:** Health Sciences

**Department:** Biomedical Sciences

**Type of learning:** Classroom-based learning

**Languages in which it is taught:** Spanish

**Lecturer/-s:**

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## Module organization

### BASIC TRAINING

Subject Matter	ECTS	Subject	ECTS	Year/semester
ANATOMY	12,00	Anatomy	6,00	1/1
		Anatomy of the Lower Extremity	6,00	1/2
BIOLOGY	12,00	Cellular and Tissular Biology	6,00	1/1
		Microbiology	6,00	1/2
PHARMACOLOGY	6,00	Pharmacology	6,00	2/1
MODERN LANGUAGE	6,00	English	6,00	2/2
STATISTICS	6,00	Biostatistics	6,00	1/1
PSYCHOLOGY	6,00	Psychology	6,00	1/2
PHYSIOLOGY	6,00	Physiology	6,00	1/1
BIOCHEMICALS	6,00	Biophysics and Biochemistry	6,00	1/1
ANTHROPOLOGY	6,00	Anthropology	6,00	1/2

## Recommended knowledge

Pre-requisites: None established



## 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 demonstrates that he or she has the appropriate knowledge of the different pharmacological groups and their possible applications in the professional field by taking a multi-response written test and solving short answer questions.
- R2 The trainee demonstrates the knowledge of recognising possible adverse reactions to drugs by taking a multi-choice written test and answering short questions.
- R3 The student demonstrates that he or she knows the main drug interactions originated by the joint administration of several drugs, as well as those generated by administering them together with food, by means of a multi-response written test and resolution of short answer questions.
- R4 The student discriminates on different therapeutic options the one most suitable to solve a certain health problem raised in written questions or raised in the classroom.
- R5 The student, based on previously acquired physiological knowledge, solves and explains pharmacokinetic and pharmacodynamic aspects of drugs raised in written questions or questions posed in the classroom.
- R6 The student demonstrates that he/she knows and interprets the graphic representations Dose/Response corresponding to the parenteral administration routes (intravenous bolus and intravenous perfusion) and extravasal administration through questions raised about the practical sessions given on this subject.
- R7 The student demonstrates that he or she knows the different pharmaceutical forms available on the market and the different ways of administering medicines through questions raised about the practical sessions given on this subject.



## 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
CB3	Students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant social, scientific or ethical issues.			X	
CB5	Students develop those learning skills necessary to undertake further studies with a high degree of autonomy.			X	

GENERAL		Weighting			
		1	2	3	4
CG2	Students know the structure and function of the human body, especially of the lower limb, semiology, mechanisms, causes and general manifestations of the disease and diagnostic methods of medical and surgical pathological processes, interrelating general pathology with foot pathology.	X			
CG3	Students develop the capacity, ability and skill necessary to diagnose, prescribe, indicate, perform and/or elaborate and evaluate any type of podiatric, orthopedic, chiropractic, podiatric surgery, physical, pharmacological, preventive and/or educational treatment, based on the clinical history.			X	
CG4	Students acquire adequate clinical experience in each of the podiatry contents, carried out in centres accredited for university podiatry training, promoting interrelationship and effective communication with patients, relatives, and members of the multidisciplinary team.			X	

SPECIFIC		Weighting			
		1	2	3	4



CE30	Students know and apply the principles of pharmacokinetics and pharmacodynamics. Action, effects, adverse reactions and pharmacological interactions Description of the different pharmacological groups. Commonly used drugs, indications and contraindications. Drug design and drug development. Prescriptions. Toxicity studies. Routes of administration of drugs. Natural products for therapeutic use, whose safety and efficacy have been demonstrated according to the available scientific evidence.				X
CE33	Students acquire teamwork skills as a unit in which professionals and other personnel related to prevention, diagnostic evaluation and podiatric treatment are structured in a uni or multidisciplinary and interdisciplinary manner	X			

## TRANSVERSAL

## Weighting

	1	2	3	4
CT1 Analytical capabilities			X	
CT3 Oral and written communication in native language			X	
CT4 Knowledge of a foreign language	X			
CT6 Information management capacity			X	
CT7 Problem solving			X	
CT15 Ethical commitment			X	
CT16 Autonomous learning			X	
CT22 Motivation for quality			X	



## Assessment system for the acquisition of competencies and grading system

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5	10,00%	Open questions
R1, R2, R3, R4, R5	70,00%	Tests
R1, R2, R3, R4, R5	5,00%	Written works
R1, R2, R3, R4, R5	5,00%	Class participation
R6, R7	10,00%	Practice exam- technical proficiency testing

### Observations

#### MINIMUM REQUIREMENTS

Attendance to practical classes/seminars is mandatory.

The course will be divided into the following evaluation items:

**1.Theoretical exam** based on the theoretical contents taught during the course and consisting of multiple choice questions (70%) and short answer questions (10%). The grade of this exam will be weighted with **80%** of the total grade of the subject. It will be necessary to obtain a grade equal or higher than 4 in order to count the rest of the marks.

**2.Practical exam** based on the knowledge acquired in the practical classes/seminars given during the course. It will be carried out together with the theoretical exam. The grade of this exam will be weighted with **10%** of the total grade of the subject. It will be necessary to obtain a grade equal or higher than 4 in order to count the rest of the grades.

**3.Notebook work and participation;** it represents **10%** of the total grade for the course. It corresponds to the attendance record of the students if it is considered and to the participation in activities developed in the classroom or through the teaching platform. The final mark for the course will correspond to the sum of the marks obtained in the theory exam, practical exam and the notebook work and participation item. The course will be considered passed when the grade of 5 is exceeded.

The passing grade corresponding to items 2 and 3 will be kept for the second sitting.

The grading criteria applied to students of second and successive enrollments will correspond, both in first and second call, to the sum of the grades obtained in: **Theoretical exam (80%) + Practical exam (20%)**. The course will be considered passed when the grade of 5 is exceeded.



## CRITERIA FOR THE AWARDING OF HONORS:

Explain specific criteria indicated for the subject and faculty to which the degree is attached and in accordance with the general regulations that indicate that only one honorary registration can be given for every 20 students not fraction of 20, with the exception of the case of groups of less than 20 students in total, in which one registration can be given.

## 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 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 Theoretical classes (TC). Training activity preferably oriented to the acquisition of knowledge skills. It is characterised by the fact that students are spoken to. Also called master class or expository class, it refers to the oral exposition made by the teacher, (with the support of a blackboard, computer and cannon for the exposition of texts, graphics, etc.).
- M2 Seminars (S). Training activity preferably oriented to obtain knowledge application and research competences. Knowledge is built through interaction and activity. Consisting of supervised monographic sessions with shared participation (Teachers, students, experts). The size of the group is variable, from a large group to small groups, no less than 6 students for interaction. The evaluation will be made by means of follow-up records by the teacher. Participation and development of problem-solving skills should be taken into account.
- M6 Laboratory Practice (CPL). Training activity of work in groups that is developed in the Laboratory. It includes the sessions where students actively and autonomously develop, supervised by the teacher, laboratory experiments. The size of the group is variable, in a range of 10-20 students.



- M7      Tutorials (T). Set of activities carried out by the teacher with personalised attention to the student or in small groups with the aim of reviewing and discussing the materials and topics presented in the classes, seminars, readings, completion of assignments, etc. The aim is to ensure that education is truly a comprehensive training of the student and is not reduced to a transfer of information. It is, therefore, a personalized relationship of help in which the teacher-tutor attends, facilitates and guides one or more students in the formative process.
- M8      Evaluation (Ev). It is the set of processes that try to evaluate the learning results obtained by the students and expressed in terms of acquired knowledge, capacities, developed skills or abilities 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 Official Calls.
- M10     Estudio del alumno: Preparación individual de lecturas, ensayos, resolución de problemas, seminarios



## IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Theoretical lessons M1	R1, R2, R3, R4, R5	35,00	1,40
Seminar M2	R6	2,50	0,10
Practice lessons M6	R6, R7	16,00	0,64
Office Hours M7	R1, R2, R3, R4, R5, R6, R7	4,50	0,18
Evaluation M8	R1, R2, R3, R4, R5, R6, R7	2,00	0,08
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>

## LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Autonomous work M10	R1, R2, R3, R4, R5, R6, R7	90,00	3,60
<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
UNIT I. GENERAL PHARMACOLOGY	<p>Presentation of the subject.</p> <p>1.- Introduction to the study of pharmacology. Concept and objectives.</p> <p>2.- General mechanisms of drug action. Drug-receptor interactions.</p> <p>3.- ADME process: Absorption, distribution, metabolism and elimination of drugs.</p> <p>4.- Routes of administration of drugs. Therapeutic guidelines.</p> <p>5.- Toxicity and adverse drug reactions. Drug interactions.</p>
UNIT II. PHARMACOLOGY OF THE AUTONOMOUS NERVOUS SYSTEM	<p>6.- Generalities of neurotransmission. Types of neurotransmitters.</p> <p>7.- Adrenergic agonist and antagonist drugs.</p> <p>8.- Cholinergic agonists and antagonists.</p>
UNIT III. PHARMACOLOGY OF THE CENTRAL NERVOUS SYSTEM	<p>9.- Pharmacology of anxiety and insomnia. Anxiolytic, hypnotic and sedative drugs.</p> <p>10.- Antidepressant and antimanic drugs.</p> <p>11.- Antiepileptic and anticonvulsant drugs.</p> <p>12.- Antiparkinsonian and antispastic drugs.</p> <p>13.- General principles of anesthesia. General, local and regional anesthesia.</p>
UNIT IV. PHARMACOLOGY OF THE CARDIOVASCULAR SYSTEM	<p>14.- Pharmacology of heart failure.</p> <p>15.- Antihypertensive, antianginal and antiarrhythmic drugs. Diuretic drugs.</p> <p>16.- Pharmacology of vascular insufficiency.</p> <p>17.- Lipid-lowering drugs.</p> <p>18.- Pharmacology of hemostasis.</p>



### UNIT V. PHARMACOLOGY OF THE RESPIRATORY SYSTEM

19.- Pharmacology of respiratory function.

### UNIT VI. PHARMACOLOGY OF THE DIGESTIVE SYSTEM

20.- Pharmacology of digestive function.

### UNIT VII. HORMONES AND METABOLISM

21.- Pharmacology related to hypothalamic and pituitary hormones.

22.- Pharmacology related to sex hormones.

23.- Pharmacology related to thyroid hormones. Calcium homeostasis.

24.- Pharmacology of carbohydrate metabolism. Insulin and oral hypoglycemic agents. Glucagon

### UNIT VIII. PHARMACOLOGY OF THE NEOPLASIC PROCESSES

25.- Antineoplastic chemotherapy

### UNIT IX. THEORETICAL-PRACTICAL SEMINARS

26. Introduction to pharmacokinetics. Practical simulation.

27. Pharmaceutical forms and routes of administration of drugs.



## Temporary organization of learning:

Block of content	Number of sessions	Hours
UNIT I. GENERAL PHARMACOLOGY	4,00	8,00
UNIT II. PHARMACOLOGY OF THE AUTONOMUS NERVOUS SYSTEM	4,00	8,00
UNIT III. PHARMACOLOGY OF THE CENTRAL NERVOUS SYSTEM	4,00	8,00
UNIT IV. PHARMACOLOGY OF THE CARDIOVASCULAR SYSTEM	8,00	16,00
UNIT V. PHARMACOLOGY OF THE RESPIRATORY SYSTEM	1,00	2,00
UNIT VI. PHARMACOLOGY OF THE DIGESTIVE SYSTEM	2,00	4,00
UNIT VII. HORMONES AND METABOLISM	4,00	8,00
UNIT VIII. PHARMACOLOGY OF THE NEOPLASIC PROCESSES	1,00	2,00
UNIT IX. THEORETICAL-PRACTICAL SEMINARS	2,00	4,00



## References

### MAIN BIBLIOGRAPHY

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2. Katzung, BG., Bertram, G. **FARMACOLOGÍA BÁSICA Y CLÍNICA**. 15ªEd. McGraw-Hill; 2022. ISBN: 9786071515810
3. Lorenzo, P., Moreno, A., Leza, JC., Lizasoain, I., Moro, MA., Portoles, A. **VELÁZQUEZ. FARMACOLOGÍA BÁSICA Y CLÍNICA**. 19ªEd., Medica Panamericana; Madrid 2018.
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6. Rang, HP. & Dale's. **PHARMACOLOGY**. 10ªEd. Elsevier LTD Oxford 2023, ISBN-13: 978-0323873956.
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### COMPLEMENTARY BIBLIOGRAPHY

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2. Buckingham, R.. **MARTINDALE. THE COMPLETE DRUG REFERENCE** 40TH Ed. Pharmaceutical Press; 2020.
3. Brunton, L.L., Hildal-Dandan, R., Knollmann, B. **GOODMAN & GILMAN: LAS BASES FARMACOLÓGICAS DE LA TERAPÉUTICA**. 13ª Ed. McGraw-Hill Interamericana; 2019.
4. Birkett, D.J. **FARMACOCINÉTICA FÁCIL**. 1ªEd. MacGraw-Hill, 2005. ISBN 9788448198046