



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: -

Type of learning: Classroom-based learning

Languages in which it is taught: Spanish

Lecturer/-s:



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:

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 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
TOTAL		60,00	2,40

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Autonomous work M10	R1, R2, R3, R4, R5, R6, R7	90,00	3,60
TOTAL		90,00	3,60



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> <ol style="list-style-type: none">1.- Introduction to the study of pharmacology. Concept and objectives.2.- General mechanisms of drug action. Drug-receptor interactions.3.- ADME process: Absorption, distribution, metabolism and elimination of drugs.4.- Routes of administration of drugs. Therapeutic guidelines.5.- Toxicity and adverse drug reactions. Drug interactions.
UNIT II. PHARMACOLOGY OF THE AUTONOMOUS NERVOUS SYSTEM	<ol style="list-style-type: none">6.- Generalities of neurotransmission. Types of neurotransmitters.7.- Adrenergic agonist and antagonist drugs.8.- Cholinergic agonists and antagonists.
UNIT III. PHARMACOLOGY OF THE CENTRAL NERVOUS SYSTEM	<ol style="list-style-type: none">9.- Pharmacology of anxiety and insomnia. Anxiolytic, hypnotic and sedative drugs.10.- Antidepressant and antimanic drugs.11.- Antiepileptic and anticonvulsant drugs.12.- Antiparkinsonian and antispastic drugs.13.- General principles of anesthesia. General, local and regional anesthesia.
UNIT IV. PHARMACOLOGY OF THE CARDIOVASCULAR SYSTEM	<ol style="list-style-type: none">14.- Pharmacology of heart failure.15.- Antihypertensive, antianginal and antiarrhythmic drugs. Diuretic drugs.16.- Pharmacology of vascular insufficiency.17.- Lipid-lowering drugs.18.- Pharmacology of hemostasis.



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



Temporary organization of learning:

Block of content	Number of sessions	Hours
UNIT I. GENERAL PHARMACOLOGY	6,00	12,00
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



References

MAIN BIBLIOGRAPHY

- Flórez, J. **FARMACOLOGÍA HUMANA**. 6ªEd. Elsevier-Masson; 2013.
- Katzung, BG., Vanderah, TW. **FARMACOLOGÍA BÁSICA Y CLÍNICA**. Ed. McGraw-Hill; 2021. ISBN: 9786071515810
- Lorenzo, P., Moreno, A., Leza, JC., Lizasoain, I., Moro, MA., Portoles, A. **VELÁZQUEZ. FARMACOLOGÍA BÁSICA Y CLÍNICA**. 19ªEd., Medica Panamericana; Madrid 2018
- Lüllmann, H., Mohr, K., Hein, L. **FARMACOLOGÍA. TEXTO Y ATLAS**. 6ªEd. Medica Panamericana; 2010
- Rang, HP., Dale, MM. **FARMACOLOGÍA**. 8ªEd. Madrid Churchill Livingstone; 2010
- Rang, HP. & Dale's. **PHARMACOLOGY**. 9ªEd. Elsevier, Madrid 2020.
- Rang y dale. **FLASHCARDS DE FARMACOLOGÍA**. 2ª Ed. Elsevier, 2021
- Raffa, R., Rawls, SM., Beyzarov, EP. **NETTER. FARMACOLOGÍA ILUSTRADA**. 1ª Ed. Elsevier; 2008.

COMPLEMENTARY BIBLIOGRAPHY

- Baxter, K., **STOCKLEY. INTERACCIONES FARMACOLÓGICAS** 3ªEd. S.L. Pharma Editores; 2009
- Brayfield, A. **MARTINDALE. THE COMPLETE DRUG REFERENCE** 39TH Ed. Pharmaceutical Press; 2017.
- Brunton, L.L., Hildal-Dandan, R., Knollmann, B. **GOODMAN & GILMAN: LAS BASES FARMACOLÓGICAS DE LA TERAPÉUTICA**. 13ª Ed. McGraw-Hill Interamericana; 2019.
- Domenech, J., Martínez, J., Peraire, C. **TRATADO GENERAL DE BIOFARMACIA Y FARMACOCINÉTICA. VOLUMEN I**. Ed. Síntesis, S.A.; 2013
- Domenech, J., Martínez, J. Peraire, C. **TRATADO GENERAL DE BIOFARMACIA Y FARMACOCINÉTICA. VOLUMEN II**. Ed. Síntesis, S.A.; 2013



Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

☒ Microsoft Teams

☒ Kaltura



Situation 3: Confinement due to a new State of Alarm.

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

☒ Microsoft Teams

☒ Kaltura

Explanation about the practical sessions:



2. System for Assessing the Acquisition of the competences and Assessment System

ONSITE WORK

Regarding the Assessment Tools:

☒ The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

☐ The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System: