

## 1. OVERVIEW

<b>Subject Area</b>	Pharmacology
<b>Degree</b>	Bachelor's Degree in Biotechnology
<b>School/Faculty</b>	Biomedical and Health Sciences
<b>Year</b>	3
<b>ECTS</b>	6 ECTS
<b>Type</b>	Compulsory
<b>Language(s)</b>	Spanish
<b>Delivery Mode</b>	On campus
<b>Semester</b>	Second semester
<b>Academic Year</b>	2024/2025
<b>Coordinating professor</b>	Laura Redondo Flórez
<b>Professors</b>	

## 2. INTRODUCTION

Pharmacology is a compulsory subject worth 6 ECTS and is taught in the second term of the third year of the Bachelor's Degree in Biotechnology.

This subject deals with the study of drugs, focusing on aspects related to the mechanisms of action, activity and pharmacological effects, therapeutic indications and clinical uses, interactions, adverse reactions and contraindications. All of this will provide students with a thorough understanding of the different types of medicines.

Students will also acquire knowledge and skills necessary for identifying, evaluating and preventing risks associated with the use of drugs, evaluating information regarding possible adverse reactions. They will also develop learning skills which will help them be more independent, using suitable information and communication technology, to stay at the forefront of the latest developments and knowledge, all the while remaining faithful to professional values and ethical behaviour and attitude in their professional development.

## 3. LEARNING OUTCOMES (RA, by the acronym in Spanish)

### Knowledge (CON, by the acronym in Spanish)

**CON05.** Understand the molecular aspects of pathologies and the mechanisms, as well as the fundamentals of diagnosis and treatment of diseases.

- Understand the origin, action and effects of substances with pharmacological activity.
- Understand the mechanisms of action, indications, interactions and side effects of the main therapeutic groups.

### Skills

**COMP19.** Analyse and examine the properties and mechanisms of action of drugs.

## 4. CONTENTS

- General principles of pharmacology. Terminology. International classification of drugs: ATC. Description of the main therapeutic groups.
- Mechanisms of drug action.
- Investigational drug research.
- Pharmacology of the digestive system.
- Pharmacology of the blood and circulatory system.
- Pharmacology of the cardiovascular system.
- Hormones and genital/urinary pharmacology.
- Anti-infective drugs.
- Pharmacology of the musculoskeletal system.
- Pharmacology of the nervous system.
- Pharmacology of the respiratory system.
- Antineoplastic pharmacology.
- Pharmacology of the sense organs.

### **UNIT 1: General aspects**

- Topic 1: General principles of pharmacology
- Topic 2: Mechanisms of drug action
- Topic 3: Information regarding drugs: ATC Classification
- Topic 4: ADRs and medical interactions
- Topic 5: Clinical trials

### **UNIT 2: Pharmacology of the autonomic nervous system**

- Topic 6.A.: Pharmacology of the ANS: Sympathetic Nervous System
- Topic 6.B.: Pharmacology of the ANS: Parasympathetic Nervous System
- Topic 7: Neuromuscular junction blockers

### **UNIT 3: Central nervous system**

- Topic 8: Antidepressants
- Topic 9: Anxiolytics
- Topic 10: Anti-epileptic drugs
- Topic 11: Anti-Parkinson, anti-migraine and neuroleptic drugs
- Topic 12: Antihistamine drugs

### **UNIT 4: ANALGESICS, ANTI-INFLAMMATORIES AND ANAESTHETICS**

- Topic 13: Corticosteroids
- Topic 14.1: NSAIDs
- Topic 14.2: Opiates
- Topic 15: Local and general anaesthetics

### **UNIT 5: ANTI-INFECTIVE DRUGS**

- Topic 16: General principles of antibiotics
- Topic 17.1: Antibiotics I
- Topic 17.2: Antibiotics II
- Topic 18: Antiviral drugs

### **UNIT 6: PHARMACOLOGY OF THE CARDIOVASCULAR AND ENDOCRINE SYSTEMS**

- Topic 19: Antihypertensives
- Topic 20: Cardiovascular system drugs: Heart failure, antianginal and antiarrhythmics
- Topic 21: Lipid-lowering drugs
- Topic 22: Pharmacology of haemostasis and coagulation
- Topic 23: Pharmacology of diabetes

**UNIT 7: PHARMACOLOGY OF THE RESPIRATORY AND DIGESTIVE SYSTEM**

- Topic 24: Pharmacology of the respiratory system
- Topic 25: Pharmacology of the digestive system

**UNIT 8: OTHER DRUGS**

- Topic 26: Pharmacology of the endocrine system: thyroids and sex hormones
- Topic 27: Antineoplastic drugs
- Topic 28: Pharmacology of the senses

## 5. TEACHING/LEARNING METHODS

The types of teaching/learning methods are as follows:

- Lecture.
- Case study
- Collaborative learning.
- Simulated environments
- Learning based on workshop teaching

## 6. LEARNING ACTIVITIES

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

**On campus:**

Learning activity	Number of hours
Lectures	44
Asynchronous master lectures	12
Case Studies	5
Problem-solving	5
Written reports and essays	5
Tutorials	15
Independent working	50
Workshops and/or lab work	8
On-campus knowledge tests	6
<b>TOTAL</b>	<b>150</b>

## 7. ASSESSMENT

The assessment methods, together with how much they each count towards the final grade for the subject area, are as follows:

**On campus:**

Assessment system	Weighting
On-campus knowledge tests	60%
Reports and written work	20%
Case study/problem scenario	15%
Laboratory practice	5%

On the Virtual Campus, when you open the subject area, you can see all the details of your assessment activities and the deadlines and assessment procedures for each activity.

### 7.1. Ordinary exam period

To pass the subject area in the ordinary exam period you must obtain a mark of 5.0 or more out of 10.0 in all assessed parts of the subject. Any part you do not pass in the ordinary exam period will need to be recovered in the extraordinary exam period (resits).

Your final grade will be the average of the partial marks in each of the learning activities you have passed.

**The final mark must be equal to or greater than 5.**

The continuous assessment system for the learning activities requires attendance to at least 50% of the classes.

*It is compulsory for students to accredit attendance to at least 50% of classes. This requirement is essential to the assessment process and qualifies students for the right to obtain academic counselling, support and monitoring from the professor. To this end, students must use the technological means made available by the University to accredit their daily attendance to each of their classes. This system will also serve to guarantee an objective record of the active role of the students in the classroom. Failure to accredit attendance to at least 50% of the classes by any of the means proposed by the University will mean that the professor awarding a fail to the student for that subject area in the ordinary exam period in accordance with the grading system outlined in these regulations. All of the above, without prejudice to the other requirements or higher attendance percentages that other faculties may stipulate in their learning guides or internal regulations. Regulations for the assessment of official degree programmes, Art. 1 point 4. ([http://www.uem.es/myfiles/pageposts/reglamento\\_evaluacion\\_titulaciones\\_oficiales\\_grado.pdf](http://www.uem.es/myfiles/pageposts/reglamento_evaluacion_titulaciones_oficiales_grado.pdf)).*

## 7.2. Extraordinary exam period (resits)

To pass the subject area in the extraordinary exam period (resits), the students must obtain a mark equal to or above 5.0 out of 10.0 in all parts of the subject assessment they did not pass during the ordinary exam period.

The student must submit the activities not passed in the ordinary exam period taking into account the corrections or comments made by the teacher. The student must also submit any activities which were not submitted.

The final grade will be the average of the partial marks in each of the activities passed (with a mark equal to or higher than 5 out of 10). The marks for the assessable activities the student passed in the ordinary exam period will be maintained for calculating this grade.

## 8. TIMELINE

The timeline with delivery dates of assessable activities in the subject area is indicated in this section:

Assessable activities	Date
Activity 1: Case study/problem scenario. Medical interactions	Week 3
Activity 2: Laboratory practice test	Week 7
Activity 3: Case study/problem scenario. Clinical case 1	Week 8
Objective knowledge test 1	Mid-term
Activity 4: Reports and written work. Laboratory guide	Week 10
Activity 5: Case study/problem scenario. Clinical case 2	Week 15
Activity 6: Reports and written work. Literature review: sexual hormones and thyroids	Week 15
Oral presentation. Literature review: sexual hormones and thyroids	Week 15
Objective knowledge test 2	Ordinary exam period

The timeline may be subject to modifications for logistical reasons of the activities. Students will be informed of any changes in due time and course.

## 9. BIBLIOGRAPHY

The recommended bibliography is indicated below:

- Flórez, J., Armijo, J.A., Mediavilla, A., Farmacología humana. 2008. Masson S.A.
- Flórez, J., Armijo, J.A., Mediavilla, A., Farmacología humana. 2013. Masson S.A. e-book
- Goodman, L.S., Gilman, A., Las bases farmacológicas de la terapéutica.
- 2009. McGraw-Hill Interamericana.

- Lorenzo, P., Moreno, A., Leza, J.C., Lizasoain, I., Moro, M.A. Velázquez,
- Farmacología Básica y Clínica. 2013. Ed. Medica Panamericana.
- Raffa, R.B., Rawls, S.M., Beyzarov, E.P. Netter Farmacología Ilustrada 2008. Elsevier
- Masson.
- Rang, H.P., Dale, M.M., Ritter, J. M. Farmacología. 7ª edic. 2012. Elsevier Churchill
- Livingstone
- Vademecum Internacional. Ed. UBM Medica, 2011
- Rang&Dale's Pharmacology. 7th Ed. 2012. Elsevier (hard copy and e-book)
- Medimecum, guía de terapia farmacológica. Luis F. Villa. 2019. Springer Healthcare

## 10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

The Educational Guidance and Diversity Unit (ODI in Spanish) offers support throughout your time at university to help you with your academic achievement. Other cornerstones of our educational policy are the inclusion of students with special educational needs, universal access in all our university campuses and equal opportunities.

This ODI unit offers students:

1. Support and monitoring through counselling and personalised student plans for those who need to improve their academic performance.
2. Curricular adaptations to uphold diversity, with assistance for those students who require specific educational support, leading to equal opportunities without significant changes to methodology or evaluation.
3. We offer students a range of extracurricular educational resources to reinforce skills which will enhance their personal and professional development.
4. Career guidance by offering tools and advice to students with doubts regarding their professional careers or those who believe they have chosen the wrong line of study.

Students who need educational support can contact us at:

[orientacioneducativa@universidadeuropea.es](mailto:orientacioneducativa@universidadeuropea.es)

## 11. SATISFACTION SURVEYS

Your opinion matters!

Universidad Europea encourages you to complete our satisfaction surveys to identify strengths and areas for improvement for staff, degree courses and the learning process.

These surveys will be available in the surveys area of your virtual campus or by email.

Your opinion is essential to improve the quality of the degree.

Many thanks for taking part.