

# Teaching guide

## IDENTIFICATION DETAILS

Degree:	Biomedicine		
Scope	Biology and Genetics		
Faculty/School:	Experimental Sciences		
Course:	PHARMACOLOGY I		
Type:	Compulsory	ECTS credits:	6
Year:	3	Code:	2155
Teaching period:	Sixth semester		
Subject:	Pharmacological Bases of Biomedicine Therapy		
Module:	Therapeutic Principles of Biomedicine		
Teaching type:	Classroom-based		
Language:	Spanish		
Total number of student study hours:	150		

## SUBJECT DESCRIPTION

Pharmacology is the science that studies the actions and properties of drugs in organisms, understanding as a drug any chemical substance used in the treatment, prevention or diagnosis of a disease, or to prevent the onset of an unwanted physiological process. This course will address the characteristics of drugs, from their pharmacokinetic properties that condition their form of administration and dosage regimen to their interactions with receptors or target sites, which are key to obtaining the pharmacological response on which their therapeutic indications will be based.

The characteristics of drugs are detailed, grouping them according to the organs or systems on which they act and their therapeutic applications.

## GOAL

Pharmacology is included in the Therapeutic Principles of Biomedicine module. The general objective is to address knowledge of preventive measures and treatments to promote recovery and maintenance of health, essential in a healthcare professional.

The specific aims of the subject are:

Know and understand the mechanisms of action of drugs in the sick organism.

Know the interactions of different drugs, the therapeutic and adverse effects of drugs, therapeutic indications and possible contraindications.

Know and understand the mechanisms of action and effects of drugs and relate them to their therapeutic indications, precautions and adverse effects.

## PRIOR KNOWLEDGE

For optimal use of the subject, students are recommended to have adequate knowledge of the subjects of Physiology, Biochemistry and Microbiology.

## COURSE SYLLABUS

### SECTION I. GENERAL PRINCIPLES OF DRUG ACTION

TOPIC 1. Pharmacology. Definition, classification and general principles

TOPIC 2. Principles of Pharmacokinetics

TOPIC 3. Pharmacodynamics. Mechanism of action of drugs

TOPIC 4. Interactions and adverse reactions

### SECTION II. CENTRAL NERVOUS SYSTEM

TOPIC 5. Chemical neurotransmission in the central nervous system

TOPIC 6. Anxiolytics and hypnotics

TOPIC 7. Antidepressants

TOPIC 8. Antipsychotic drugs

TOPIC 9. Anticonvulsant drugs

TOPIC 10. Pharmacology of neurodegenerative diseases

### SECTION III. AUTONOMIC AND PERIPHERAL NERVOUS SYSTEM

TOPIC 11. Chemical neurotransmission in the autonomic nervous system

TOPIC 12. Pharmacology of adrenergic transmission

TOPIC 13. Pharmacology of cholinergic transmission

TOPIC 14. Pharmacology of the vegetative ganglia and motor plate

### SECTION IV. PAIN AND SWELLING. CELLULAR MEDIATORS

TOPIC 15. Histamine and Serotonin

TOPIC 16. Opioid analgesic drugs

TOPIC 17. Non-steroidal anti-inflammatory drugs

### SECTION V. CIRCULATORY SYSTEM

TOPIC 18. Drugs that regulate vascular volume and tone

TOPIC 19. Drugs that regulate heart function  
 TOPIC 20. Diuretics  
 TOPIC 21. Pharmacology of coagulation  
 TOPIC 22. Lipid-lowering agents  
 SECTION VI. ENDOCRINE PHARMACOLOGY  
 TOPIC 23. Hypothalamus. Pituitary gland. Adrenal cortex  
 THEME 24. Thyroid Hormones and Bone Metabolism  
 TOPIC 25. Hypoglycemic drugs  
 TOPIC 26. Sex hormones.  
 SECTION VII. RESPIRATORY AND DIGESTIVE SYSTEMS  
 TOPIC 27. Pharmacology of the respiratory system  
 TOPIC 28. Pharmacology of the digestive system  
 SECTION VIII. ANTIBIOTICS AND ANTINEOPLASTIC DRUGS  
 ITEM 29. Antibiotics.  
 TOPIC 30. Anti-tuberculosis drugs. Antifungals. Antivirals.  
 TOPIC 31. Antineoplastic agents.

## EDUCATION ACTIVITIES

AF1. Expository classes: They will be based on participatory master classes, supported by teaching resources and trying to promote student interest and involvement by posing brief questions.  
 AF2. Practical classes: Work sessions in small groups supervised by the teacher.  
 AF3. Teamwork based on cooperative learning: This teaching methodology, developed in small groups, will be used to work on the contents of some of the theoretical topics of the subject.  
 AF4. Tutoring: They allow us to resolve any doubts that may have arisen during other teaching activities.  
 The Campus e-Learning platform will be very useful for monitoring and effective communication between students and teachers. On the e-Learning Campus, the student will have information and material to support the classes to promote the study of the subject.  
 \*The teachers of the subject do not authorize the publication by the student of the material provided by the teachers of the subject in the virtual classroom, or by any other means.

## DISTRIBUTION OF WORK TIME

TEACHER-LED TRAINING ACTIVITIES	INDIVIDUAL WORK
60 Horas	90 Horas

## LEARNING RESULTS

Understand the principles of molecular pharmacology, the interactions of drugs with their receptors or target sites, which are key to obtaining pharmacological effects, and to know the methods of study in the laboratory, in order to

be able to apply them to the research of new drugs at the preclinical level.

Know the principles of general pharmacology and relate the physico-chemical characteristics of drugs to their pharmacokinetic and pharmacodynamic properties.

Understand and identify the methodology used in the design and evaluation of drugs in preclinical and clinical trials.

Understand the different therapeutic strategies established for the treatment of diseases, with the combination of drugs and other non-pharmacological measures.

Know the pharmacological actions of drugs and relate them to therapeutic effects and adverse reactions, identifying relevant pharmacogenomic and pharmacoproteomic aspects to achieve greater effectiveness and safety of pharmacological treatments.

## **SPECIFIC LEARNING RESULTS**

Define the terminology of interest in Pharmacology.

Identify and distinguish the mechanisms, actions and effects of drugs, which justify both their therapeutic applications and their adverse reactions.

Describe the chemical composition of drugs and the way in which they act on the different systems and apparatus of the human body and its diseases.

Understand and identify the techniques used in the design and evaluation of pre-clinical and clinical trials

Identify the different physical and chemical properties of drugs and relate them to their pharmacokinetic properties.

## **LEARNING APPRAISAL SYSTEM**

### **REGULAR EVALUATION SYSTEM**

ISE1. Evaluation of the theoretical content of the subject through oral or written tests with development, short answer or test-type questions (70%).

IF 2. Carrying out and solving exercises and practical cases (15%).

IF 3. Evaluation of seminar work and teamwork based on cooperative learning (Problem Based Learning, ABPs) (15%).

It is an essential requirement to be able to pass the subject: To have attended and completed the internships and the ABPs and to obtain at least 50% of the maximum grade in each part of the course (SE1, SE2 and SE3). The same evaluation system is maintained in the extraordinary call, keeping the score of the theory exam or the practices/ABPS if they have been passed.

### **ALTERNATIVE EVALUATION SYSTEM**

This system is intended for repeat students who do not take advantage of the ordinary evaluation system because they cannot attend classes on a regular basis. Students in second or subsequent enrollment must contact the

teacher to request to take advantage of this system. In this case, consideration will be given to:

- Evaluation of the theoretical content of the subject through oral or written tests with development, short answer or test-type questions (70%) (same face-to-face test as in the ordinary evaluation system).
- Carrying out and solving exercises and practical cases (15%). The approved grade from last year is preserved.
- Evaluation of teamwork based on cooperative learning (Problem Based Learning, ABPs) (15%). The approved grade from last year is preserved.

\* Plagiarism, as well as the use of illegitimate means in evaluation tests, will be sanctioned in accordance with the university's Evaluation Regulations and Coexistence Regulations.

## ETHICAL AND RESPONSIBLE USE OF ARTIFICIAL INTELLIGENCE

1.- The use of any Artificial Intelligence (AI) system or service shall be determined by the lecturer, and may only be used in the manner and under the conditions indicated by them. In all cases, its use must comply with the following principles:

- a) The use of AI systems or services must be accompanied by critical reflection on the part of the student regarding their impact and/or limitations in the development of the assigned task or project.
- b) The selection of AI systems or services must be justified, explaining their advantages over other tools or methods of obtaining information. The chosen model and the version of AI used must be described in as much detail as possible.
- c) The student must appropriately cite the use of AI systems or services, specifying the parts of the work where they were used and describing the creative process followed. The use of citation formats and usage examples may be consulted on the Library website([https://www.ufv.es/gestion-de-la-informacion\\_biblioteca/](https://www.ufv.es/gestion-de-la-informacion_biblioteca/)).
- d) The results obtained through AI systems or services must always be verified. As the author, the student is responsible for their work and for the legitimacy of the sources used.

2.- In all cases, the use of AI systems or services must always respect the principles of responsible and ethical use upheld by the university, as outlined in the [Guide for the Responsible Use of Artificial Intelligence in Studies at UFV](#). Additionally, the lecturer may request other types of individual commitments from the student when deemed necessary.

3.- Without prejudice to the above, in cases of doubt regarding the ethical and responsible use of any AI system or service, the lecturer may require an oral presentation of any assignment or partial submission. This oral evaluation shall take precedence over any other form of assessment outlined in the Teaching Guide. In this oral defense, the student must demonstrate knowledge of the subject, justify their decisions, and explain the development of their work.

## BIBLIOGRAPHY AND OTHER RESOURCES

### Basic

Jesus, Flórez Beledo. Human Pharmacology [Electronic Resource]/6th ed. Barcelona:Elsevier, 2013.

director, Jesús Flórez; associate directors, Juan Antonio Armijo, Árica Mediavilla. Human Pharmacology/5th ed. Barcelona: Elsevier, 2008.

H. P. Rang... [et al.]. Rang and Dale: Pharmacology/7th ed. Barcelona: Elsevier, 2012.

H. P. Rang... [et al.]. Rang and Dale [Electronic Resource]: Pharmacology/8th ed. Madrid:Elsevier, 2016.

G. Brenner, Craig W. Stevens. Basic Pharmacology [Electronic Resource]/5th ed. Barcelona: Elsevier, 2019.