

**COURSE DATA****Data Subject**

Code	34465
Name	General pharmacology of organs and systems
Cycle	Grade
ECTS Credits	4.5
Academic year	2024 - 2025

Study (s)

Degree	Center	Acad. year	Period
1204 - Degree in Medicine	Faculty of Medicine and Odontology	3	First term

Subject-matter

Degree	Subject-matter	Character
1204 - Degree in Medicine	11 - Diagnostic and therapeutic procedures	Obligatory

Coordination

Name	Department
CALATAYUD ROMERO, FRANCISCA SARA	135 - Pharmacology

SUMMARY

Pharmacology is the science in which properties and effects of drugs and their interaction with living beings are studied. It is a branch of medicine focused on its therapeutic, preventive and diagnostic usage for the human being.

The objective of this subject is the development of knowledge, working capacity and communicative skills in the area of analysis of the updated information in all different aspects of pharmacological therapeutics. The incorporation of new information and communication technologies and literature search will contribute to such objectives. Among the formative activities, we can find the following: aspects related to knowledge on forms of drug administration for humans, parameters which are useful to study the temporary evolution of drugs in the organism, studies on mechanisms of action of drugs and pharmacological interactions, as well as the interpretation of the most representative pharmacological effects, and special seminars aimed at studying important pharmacological issues.

**PREVIOUS KNOWLEDGE****Relationship to other subjects of the same degree**

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

In order to course this subject, it is advisable that the student passes the knowledge of human anatomy, biology, biochemistry and physiology.

COMPETENCES (RD 1393/2007) // LEARNING OUTCOMES (RD 822/2021)**1204 - Degree in Medicine**

- Establish the diagnosis, prognosis and treatment, applying principles based on the best information available and on conditions of clinical safety.
- Indicate the most accurate therapy in acute and chronic processes prevailing, as well as for terminally ill patients.
- Acquire proper clinical experience in hospitals, health care centres and other health institutions, under supervision, as well as basic knowledge of clinical management focused on the patient and the correct use of tests, medicines and other resources available in the health care system.
- Know how to use the sources of clinical and biomedical information available, and value them critically in order to obtain, organise, interpret and communicate scientific and sanitary information.
- Know how to use IT in clinical, therapeutic and preventive activities, and those of research.
- Keep and use medical records which contain information about the patient for later analysis, preserving the confidentiality of personal data.
- In the professional practise, take a point of view which is critical, creative, constructive and research-oriented.
- Understand the importance and the limitations of scientific thinking in the study, prevention and management of diseases.
- Be able to formulate hypothesis, gather information and evaluate it critically in order to solve problems by following the scientific method.
- Establish a good interpersonal communication which may allow professionals show empathy and talk to the patients efficiently, as well as to their relatives, the media and other professionals.
- Organizar y planificar adecuadamente la carga de trabajo y el tiempo en las actividades profesionales.
- Capacidad para trabajar en equipo y para relacionarse con otras personas del mismo o distinto ámbito profesional.



- Criticism and self-criticism skills.
- Capacity for communicating with professional circles from other domains.
- Acknowledge diversity and multiculturality.
- Consideration of ethics as a fundamental value in the professional practise.
- Working capacity to function in an international context.
- Knows the main groups of drugs, doses, routes of administration and pharmacokinetics. Interactions and adverse effects.
- Knows pharmacology of various organs and systems.
- Knows how to use medicines properly. Analgesic, antineoplastic, antimicrobial and anti-inflammatory drugs.
- Understands the characteristics of surgical haemorrhage and thromboembolic prophylaxis.
- Compiles medical prescriptions correctly, adapted to the patient's situation and legal requirements.

LEARNING OUTCOMES (RD 1393/2007) // NO CONTENT (RD 822/2021)

- To know the scientific bases in which the pharmacological therapeutics is settled.
- To understand the pharmacokinetic aspects of a drug or pharmacological group, which indicate the influence of the human organism on it.
- To reason the influence of the drugs on the organism.
- To understand the bases of the drugs action over the physiopathology of the del human being.
- To know the interference possibilities with drugs over the functions and mediators of the organism and their possible therapeutic impact.
- To know the effects of the drugs or pharmacological groups on the different organs and systems of the human being.
- To reason what effects of a determined drug will have a hypothetical therapeutic application and which ones will be interpreted as adverse reactions, according to the patient.
- To know the bases of possible interactions among different drugs in the organism with the objective of their prevision in the medical practice.

DESCRIPTION OF CONTENTS

1. THEORETICAL THEMATIC UNITS



1. Introduction to Pharmacology. Terminology. Basic concepts.
2. Pharmacokinetics. LADME processes. Influence of specific circumstances (illness, age, and gender).
3. Pharmacodynamics. Mechanism of action of drugs. Pharmacological interactions. Adverse reactions. Influence of specific circumstances (illness, age, and gender).
4. Pharmacology of the peripheral nervous system: Cholinergic and adrenergic systems.
5. Pharmacology of the central nervous system: Antidepressants. Anxiolytics and sedatives. Antiepileptics and anticonvulsants. Antipsychotics. Pharmacology of Parkinson's disease and other neurodegenerative disorders.
6. Opioids and anesthetics.
7. Nonsteroidal anti-inflammatory drugs. Glucocorticoids. Antihistaminics.
8. Immunomodulatory drugs.
9. Pharmacology of the cardiovascular and renal systems: Treatment of heart failure. Antihypertensives. Antianginal agents. Antiarrhythmics.
10. Pharmacology of the blood: Hematopoiesis. Coagulation. Lipidemia. Uremia.
11. Pharmacology of the respiratory system.
12. Pharmacology of the digestive system: Antisecretory drugs. Antidiarrheal agents. Laxatives. Prokinetics. Antiemetics.
13. Pharmacology of the endocrine system: Pancreas. Thyroid. Gonads. Hypothalamus-pituitary axis. Hormonal regulation of calcium and phosphorus.
14. Anti-infective pharmacology: Antibacterial agents. Antifungal drugs. Antiparasitic agents. Antiviral drugs. Antiseptics.
15. Antineoplastics.

2. SEMINARS

1. Integrated study of pharmacological possibilities against CNS disorders.
2. Integrated study of the pharmacological possibilities against inflammatory and/or immune disorders.
3. Integrated study of the pharmacological possibilities against disorders of the cardiovascular system.
4. Integrated study of the pharmacological possibilities against metabolic disorders.

3. LABORATORY PRACTICES

1. Analysis of the plasma level curve and the main pharmacokinetic parameters.
2. Design and analysis of dosage patterns.
3. Study of routes of administration / pharmaceutical forms.
4. Study of the drug-receptor interaction. Dose-response curve analysis.
5. Scientific approach to the study of drugs modulating nerve transmission.
6. Scientific approach to the study of anti-inflammatory and/or immunomodulatory drugs.
7. Scientific approach to the study of drugs modulating cardiovascular function.
8. Scientific approach to the study of anti-infective drugs.
9. Analysis and discussion of the pharmacology of other organic systems.

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Laboratory practices	30,00	100
Theory classes	19,00	100
Seminars	7,00	100
Development of group work	10,00	0
Development of individual work	6,25	0
Study and independent work	15,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	15,00	0
Preparation of practical classes and problem	5,00	0
TOTAL	112,25	

TEACHING METHODOLOGY

- **Theoretical Lessons** (15 Thematic Units). The theoretical content will be taught of the different parts of the subject that can be complemented by audiovisual media, adapted for the subject.

- **Seminar Practical Lessons** (4 Thematic Units) about different theoretical aspects related with the use of drugs in the medical practice.

- **Laboratory Practical Lessons** (15 Thematic Units). These units are attending and with reduced groups, taught in the teaching laboratory where, individually, different experimental situations are recreated, which visualize the effects of the different pharmacological groups over different organs and tissues (pharmaco-dynamics). Likewise, different kinetic problems are studied, which appear during the application of the pharmacological treatments (pharmaco-kinetics). Other aspect which is taught in the practical lessons is the study of the action of different pharmacological treatments that are applied to different concrete clinical situations (clinical indication).

The gender perspective, the respect for diversity, and the sustainable development goals (SDGs) will be incorporated into teaching, whenever possible.

EVALUATION

The grade comes from the sum of the scores obtained in the following activities:

Theoretical evaluation: It will be carried out through a final written test composed of 50 multiple choice questions with four possible answers. Each correct answer will add 1 point, each incorrect answer will subtract 0.25 points and blank answers will not score. The maximum grade will be 50 points and a minimum of 25 points will be required to pass the subject.



Practical evaluation: A final written test will be carried out that will include pharmacological problems and / or clinical cases, whose maximum score will be 30 points and a minimum of 15 points will be required to pass the subject. The remaining 20 points will come from continuous evaluation activities proposed in the practical sessions.

Attendance at practical activities is mandatory. The student is considered to meet this requirement if he or she has attended a minimum of 80% of these activities and has adequately justified the impossibility of attending the remaining sessions due to the occurrence of a cause of force majeure. It will be essential to comply with this requirement to pass the subject.

Students are reminded of the importance of carrying out evaluation surveys on all the teaching staff of the degree subjects.

REFERENCES

Basic

- Goodman and Gilman (2022). The Pharmacological Basis of Therapeutics. 14th ed. McGraw-Hill Education/Medical.
- Rang y Dale (2020). Farmacología. 9ª ed. Elsevier.
- Katzung, B.G. (2021). Basic and 15th Clinical Pharmacology ed. McGraw-Hill LANGE
- Rang y Dale (2020). Farmacología. 9ª ed. Elsevier.
- Velázquez. (2017). Farmacología Básica y Clínica 19ª ed. Madrid. Editorial Médica Panamericana.

Additional

- Florez J. (2013). Farmacología Humana, 6ª ed., Elsevier-Masson
- Golan DE. (2017) Principios de farmacología. Bases fisiopatológicas del tratamiento farmacológico. 4ª ed. Lippincott Castellano
- Dipiro JT. Pharmacotherapy. A pathophysiologic approach. 10th ed. McGraw-Hill Education/Medical.
- RECURSOS e-Salut:
ClinicalKey Student Medicina, Odontología y Enfermería
[<https://uv-es.libguides.com/RecursosSalut>]
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