

## 27137 - Pharmacology

### Syllabus Information

**Academic Year:** 2021/22

**Subject:** 27137 - Farmacología

**Faculty / School:** 100 - Facultad de Ciencias

**Degree:** 446 - Degree in Biotechnology

**ECTS:** 6.0

**Year:** 4

**Semester:** First semester

**Subject Type:** Optional

**Module:**

### 1. General information

### 2. Learning goals

### 3. Assessment (1st and 2nd call)

### 4. Methodology, learning tasks, syllabus and resources

#### 4.1. Methodological overview

The methodology followed in this course is oriented towards achievement of the learning objectives. It favors the acquisition of knowledge related to Pharmacology. A wide range of teaching and learning tasks are implemented, such as theory sessions, practice sessions, assignments, and tutorials.

The subject has a basic orientation. The proposed activities are directed to understand and assume the fundamental principles of the Pharmacology. Moreover, the acquisition of conceptual, manual and technique knowledge will help to the students to manage the process of the drugs biotransformation from the point of view both, of molecular and cellular mechanisms, which are essential to the future of the Biotechnology professionals.

The acquired knowledge from the theory sessions will be complemented with the practice sessions where the student will learn about the different methods usually used in Pharmacology and its practical application.

Tutorials will be held to follow the learning process of the students. They can choose between the conventional tutorials and specific tutorials related with the practical-classes as seminars.

Students are expected to participate actively in the class throughout the semester.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class, the course syllabus, as well as other course-specific learning materials.

Further information regarding the course will be provided on the first day of class.

#### 4.2. Learning tasks

The course includes the following learning task:

- **Lectures (1,28 ECTS):** It consists on 32 onsite hours face to face participative sessions lasting 50 minutes each one. The professor will present theoretical contents which will be available at the Moodle website. In the lectures a presentation and explanation of the subject contents will be held in order to prepare the students for achieving the competences and learning outcomes as required.
- **Practice sessions (0,80 ECTS):** It consists on 20 onsite hours; the practice sessions will take place during two weeks and will be divided into two modules. Students are divided into smaller groups.

- Autonomous work (3,64 ECTS) : 91 hours.
- Tutorial sessions (0,28 ECTS): 7 hours onsite hours.

The teaching and evaluation activities will be carried out in face-to-face mode, unless, due to the health situation, the provisions issued by the competent authorities and by the University of Zaragoza require them to be carried out telematically

### 4.3. Syllabus

The course will address the following topics:

#### Section 1. General Principles of Pharmacology

- Topic 1. Pharmacology concepts: Active pharmaceutical ingredient, drug. Drug life cycle research.
- Topic 2. Pharmacokinetics: Drug passage across the membrane. Routes of administration. Drug absorption. Drug distribution. Drug metabolism and excretion.
- Topic 3. Pharmacodynamics: Mechanism of drug actions. Pharmacological actions. Drug receptor concept and types. Dose-response curves. Pharmacological interactions.
- Topic 4. Side effects
- Topic 5. Pharmacogenetics and Pharmacogenomics
- Topic 6. Omic Sciences
- Topic 7. Food-drug interactions. Nutrigenomics
- Topic 8. Toxicology: Intoxication with drugs
- Topic 9. Drug development
- Topic 10. Clinical Trials and Pharmacoepidemiology
- Topic 11. Socioeconomic aspects of the drugs

#### Section 2. Pharmacology of Systems

- Topic 1. Pharmacology of Autonomic Nervous System
- Topic 2. Pharmacology of Central Nervous System
- Topic 3. Pharmacology and the Immune System
- Topic 4. Chemotherapeutic Agents
- Topic 5. Pharmacology of Blood Disorders
- Topic 6. Pharmacology of Endocrine System: Thyroid hormones. Antidiabetic drugs. Cortical steroids. Lipid-lowering drugs. Pharmacology of the calcium and phosphorus. Sex hormones
- Topic 7. Drugs of abuse
- Topic 8. Pharmacology of doping

#### Practice sessions of Pharmacology

- 1st Module
  - Simulation on drug administration at Cardiovascular level
  - Workshop: Routes of drug administration and pharmaceutical forms
- 2nd Module
  - Practical on-site activities: visiting to pharmaceutical company
  - Pharmacology Congress on University Teaching

### 4.4. Course planning and calendar

Schedules of lectures and practice will coincide with the officially established and will be available at: <https://ciencias.unizar.es/grado-en-biotecnologia>.

The places, calendar and groups for training and practical sessions will be established in coordination with the rest of subjects at the beginning of course. The Coordinator will produce the groups of students for these activities at beginning of course to avoid overlaps with other subjects

For students enrolled in the subject, places, times and dates of lectures and practical sessions will be public via Bulletin Board advertisements of the grade on the platform Moodle at the University of Zaragoza, <https://moodle2.unizar.es/add/>, and in the moodle page for the course. These routes will be also used to communicate enrolled students their distribution by groups of practical sessions, which will be organized by the coordination of degree. Provisional dates will be available on the website of the Faculty of Sciences in the corresponding section of the Degree in Biotechnology: <https://ciencias.unizar.es/grado-en-biotecnologia>.

In this web there will be also available the dates of exams.

### 4.5. Bibliography and recommended resources

<http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=27137>

