Universidad Zaragoza

Academic Year/course: 2023/24

27217 - Biochemistry

Syllabus Information

Academic year: 2023/24
Subject: 27217 - Biochemistry
Faculty / School: 100 - Facultad de Ciencias
Degree: 452 - Degree in Chemistry
ECTS: 7.0
Year: 3
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

Biochemistry is a compulsory subject of the fundamental module that aims to provide students with the necessary knowledge to understand the behaviour of biological systems in terms of chemical processes. It is structured in 2 sections: Theory-problem classes (5 credits) and laboratory practices (2 credits).

Its approach and objectives are aligned with the Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda, (https://www.un.org/sustainabledevlopment/es/), specifically SDGs 3, 6, 10 and 12.

2. Learning results

In order to pass this subject, students shall demonstrate they have acquired the following results:

- To know the formulation of the main types of biomolecules
- To identify the properties of biological macromolecules related to their chemical characteristics To formulate and adjust chemical reactions of major importance in biological processes
- To know how to perform kinetic and thermodynamic calculations of biochemical reactions
- To describe the biochemical processes involved in the transmission of genetic information
- To perform enzyme activity measurements
- To identify different types of sugars and quantify lipids
- To collect information on a subject in biochemical databases

3. Syllabus

Theory classes and case studies/problems

1. Chemical composition of living matter
2. Biomolecules
3. Enzymes
4. Enzyme regulation
5. Introduction to metabolism
6. Glycolysis
7. Citric acid cycle
8. Pentose phosphate pathway
9. Gluconeogenesis
10. Glycogen metabolism
11. Oxidative phosphorylation
12. Photosynthesis
13. Fatty acid catabolism
14. Fatty acid biosynthesis
15. Cholesterol biosynthesis
16- Nitrogen metabolism
17- Origin of organic nitrogen
18- Metabolism Integration
19- DNA and RNA metabolism

20- Recombinant DNA technology

Laboratory sessions

- Protein electrophoresis
- Enzymatic activity
- Sugar characterization
- Extraction and quantification of lipids
- DNA isolation

4. Academic activities

The program offers the students help to achieve the expected results and comprises the following activities: **Theory classes** (35 hours) **and case studies/problems** (15 hours)

Explanations of the topics that comprise the program of the subject and practical questions/cases to apply the knowledge explained .

Laboratory practices: 20 hours

Practical work in the laboratory that follows a theoretical introduction to the techniques and biomolecules analysed during the session.

Personal study: 105 hours

Assessment tests. 6 hours

5. Assessment system

The student must demonstrate achievement of the intended learning results through the following assessment activities:

Evaluation of theoretical topics. The tests will consist of questions and exercises to be answered in a justified manner and single-answer multiple-choice questions (**TP** grade) and will be held in both calls. It will be carried out in the first and second calls.

Evaluation of practical laboratory work. 10% laboratory grade (answers to questions of the scripts) and 90% grade of a written test with multiple-choice or short questions that will be carried out in the two calls (Note **L**).

Final grade = 0.2*L + 0.8*TP

To apply this expression, both L and TP must be equal to or greater than 5. However, those students with L equal to or higher than 4 can compensate and pass the subject if the final grade is equal to or higher than 5.

Students who do not attend the laboratory practices will have to pass an additional test of practical knowledge of the topics covered in them, in addition to the exam (written test) of the practices.

The parts L or TP that have been passed (grade higher than or equal to 5) in the first will be saved for the second call.