

27108 - Biochemistry

Syllabus Information

Academic year: 2024/25

Subject: 27108 - Biochemistry

Faculty / School: 100 - Facultad de Ciencias

Degree: 446 - Degree in Biotechnology

ECTS: 12.0

Year: 2

Semester: Annual

Subject type: Compulsory

Module:

1. General information

Basic training subject of the Biotechnology Degree. Enzymology and Metabolic Biochemistry seek to know the processes and mechanisms by which living beings are able to obtain and transform energy and substrates to form their own components and carry out the functions that characterize them. Enzymes are key to enable these vital processes under physiological conditions due to their high efficiency and specificity.

2. Learning results

- To understand the concept of enzyme and its general characteristics.
- To know the different kinetic and regulatory aspects of its catalytic activity.
- To understand the mechanisms underlying their catalytic activity.
- To know the basic aspects of the industrial and technological use of enzymes.
- To know and understand the basic principles of bioenergetics and metabolism.
- To know the main metabolic pathways and the organs where they take place.
- To understand in detail the functions of the main metabolic pathways.
- To understand the close interrelationship between the different metabolic pathways.
- To understand and be able to describe in detail some of the mechanisms of metabolic regulation: allosteric and hormonal action and transcription factors.
- To understand the role of transport processes as part of a metabolic transformation and their possible role in its regulation.
- To understand and know some specific examples of metabolic defects that cause diseases.
- To be able to describe the main metabolic events and organs involved in responses to specific metabolic situations such as exercise, acidosis, fasting and pathologies such as diabetes, obesity and cancer.

3. Syllabus

First part: Enzymology (4,5 ECTS, 3,5 Theory and 1 Problems/Seminars)

- Chemical nature of enzymes, functions and properties.
- Enzyme kinetics.
- Enzyme catalytic strategies and regulation of enzyme activity.
- Enzymatic technology.

Second part: Metabolism (7.5 ECTS, 5.5 Theory and 2 Problems/Seminars)

- Introduction to the study of metabolism.
- Carbohydrate metabolism.
- Lipid Metabolism.
- Metabolism of nitrogen compounds.
- Integration of metabolism and metabolic adaptations.

The detailed Program will be available in the corresponding ADD (Anillo Digital Docente) of the subject.

4. Academic activities

Lectures: sessions in which the teacher will explain the syllabus of the subject: 90 hours

Problem Classes: problem solving sessions, questions and practical cases posed by the teacher. 26-30 hours

Seminars: sessions where novel issues not included in the program will be addressed and taught, if possible, by other teachers and researchers: 0-4 hours

The degree of fulfilment of the following objectives will be evaluated through it:

- (a) to know the specific contents of the subject collected in the program,
- b) to interrelate those contents and
- c) to apply this knowledge to solve specific problems/questions in a justified manner.

5. Assessment system

The degree of fulfillment of the course objectives will be assessed, placing special emphasis on the interrelation of the contents and their application to the resolution of specific issues in a justified manner.

Continuous assessment: two independent midterms through a written exam for each of them. Midterm 1: Enzymology and Midterm 2: Metabolism.

FINAL GRADE: *35% of the 1st midterm + 65% of the 2nd midterm, as long as the grade obtained in each of them is equal to or greater than 5 points out of 10. If they cannot be added, the final grade will be the lowest of them.*

The exam may contain various types of questions in different proportions each one or all of them of the same type: development of topics, resolution of questions in a justified manner and test-type questions with single and/or multiple answers.

If the exam contains a section of multiple choice questions and another section of development questions and/or to justify, 5 points out of 10 must be obtained in each section to add them together. If they cannot be added together, the final grade will be the lowest of them.

Once this Continuous Assessment has been passed, the student's grade will be transferred to the Grades certificate of the 1st official call, without prejudice to the fact that the student may apply to increase the grade obtained in the Global proof of this 1st call, which would include all the subject matter. Once the Continuous Assessment has not been passed, the student must take the Global proofs, which will be governed by the same evaluation criteria as above. In the 1st call, the student must take the entire subject matter (Midterm 1 and 2). If only one of the midterm is passed, this grade will be maintained until the 2nd call; the grade in Grades certificate will be a fail.

6. Sustainable Development Goals

- 3 - Good Health & Well-Being
- 4 - Quality Education
- 5 - Gender Equality