Universidad Zaragoza

Academic Year/course: 2023/24

29302 - Biochemistry and molecular biology

Syllabus Information

Academic year: 2023/24
Subject: 29302 - Biochemistry and molecular biology
Faculty / School: 229 - Facultad de Ciencias de la Salud y del Deporte
Degree: 442 - Degree in Odontology
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module:

1. General information

The discipline is part of the basic training module. The general objective of this subject is to instil in the students the basic fundamentals of all the biological molecules that in later subjects will be applied to the study of physiological functions, pathologies and their treatment.

The passing of this subject enables students to follow other subjects, such as General Human Physiology, Oral Microbiology and Pharmacology.

It is recommended to have taken Biology and Chemistry during the Baccalaureate and to keep the work in the subject updated. Attendance to theory classes and seminars is important and attendance to practices is mandatory.

The acquisition of the learning results of the subject provides training and competence to contribute to Sustainable Development Goals (SDGs) of the 2030 Agenda of United Nations (https://www.un.org/sustainabledevelopment/es/:

- 3: Health and wellness
- 4: Quality Education.
- 5: Gender Equality.

2. Learning results

Upon completion of this subject, the student will be able to:

1.- Identify and know the structure of biomolecules, the metabolic reactions of transformation and synthesis of these biomolecules, as well as the mechanisms of regulation, so the student is able to solve problems related to chemical and biochemical principles using biochemical terminology.

2.- Know the mechanisms for obtaining and transforming metabolic energy.

3.- Explain how all the inanimate molecules that make up living organisms influence each other to form, maintain and perpetuate life..

4.- Manage in a biochemical laboratory and perform the most basic biochemical techniques 5.- Handle the most relevant sources of information.

6.- Describe the molecular basis of genetic inheritance.

3. Syllabus

1. Water

2. Amino acids

3. Peptides and Proteins

4. Three-dimensional structure of proteins

5. Enzymes

6.- Vitamins

7. Cofactors

8.- Intermediate metabolism

9. Carbohydrates and sugars biology. Digestion and absorption.

10. Glycolysis, Gluconeogenesis and Pentose Phosphate Pathway

11. Glycogen Metabolism

12. Lipids generalities.

13. Digestion, absorption and transport

14. Fatty acid catabolism

15. Lipid biosynthesis

16.- Amino acid degradation: Nitrogen destination

17.-Amino acid degradation: Destination of carbonaceous skeleton

18. Biosynthesis of Amino Acids, Nucleotides, and Related Molecules

19. Citric Acid Cycle

20. Oxidative phosphorylation

21.Nucleic acids.

22. DNA replication.

23. DNA transcription: the synthesis of RNA.

24. Translation of the genetic message: protein biosynthesis.

25. Mitochondrial genetic system.

26. Regulation of gene expression

4. Academic activities

The subject is structured as follows:

- 45 hours of participatory master classes
    - The information will be collected in the ADD.
- 10 hours of laboratory practice
    - Sessions of 2 hours are conducted in groups of 12 students.
- 5 hours of seminars
    - The seminars will be organized in 2-hour sessions and will include an introduction to the thematic block
- Completion and presentation of a tutored work.
    - They will be carried out in groups of 3-4 students and will be related to the handling of bibliography related to the field of study.
- Delivery of a conceptual map at the end of each thematic block and 5 multiple-choice questions with 5 answers where only one of them is true.

5. Assessment system

CONTINUOUS EVALUATION:

- There will be two midterm tests consisting of 15 multiple-choice questions (with 5 answers and only one valid answer) and two short questions.
    - To pass the multiple-choice test, it is necessary to have 10 correct answers. Having 8 correct answers will grant the student the possibility of compensating the grade.
    - Only those students who pass the first midterm or who have a compensable will be allowed to take the second midterm.
    - These mid-term exams will be worth 60% of the student's final grade Delivery of concept maps and questions (20%)
- Information research work and presentation in class (15%)
- Practices (5%)

Non-attendance to the practices implies passing them by means of a 5-question practice exam.

In order to pass the subject it is necessary to pass the written exam.

FINAL TEST:

- There will be an exam, which will account for 80% of the final grade and will consist of two parts:
    - A 30-question multiple-choice test in which students must obtain 70% to pass and 60% to compensate.
    - A developmental part consisting of five short questions, one of which may be about practices

To pass the written test, each of the parts must be passed separately.

- Information research work and presentation in class (15%)
- Practices (5%)