

29239 - Structural Biochemistry

Syllabus Information

Academic year: 2024/25

Subject: 29239 - Structural Biochemistry

Faculty / School: 229 - Facultad de Ciencias de la Salud y del Deporte

Degree: 441 - Degree in Human Nutrition and Dietetics

ECTS: 7.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

The subject "Structural Biochemistry" aims to explain the basic physicochemical concepts on which the structural and functional diversity of biomolecules rests, and that students acquire a proper understanding of how all physiological processes, including nutrition, are based on them. Consequently, the student is encouraged to acquire the ability to identify and explain the physicochemical principles that support the structure-function relationship of biomolecules and cellular organization, to relate them to the biological and biochemical processes that support, in turn, the physiological and nutritional ones.

In addition, the acquisition of the subject learning results provide training and competence to contribute to some extent to the achievement of SDGs 3, 4 and 12.

2. Learning results

The student, in order to pass this subject, must demonstrate the following results:

- Demonstrate a basic understanding of the structure and function of the human body at the molecular level (i.e., the properties and function of its biomolecules)
- Demonstrate knowledge of the chemical, biochemical and biological fundamentals of application in human nutrition and dietetics.
- Demonstrate an understanding and use, appropriately and accurately, of relevant biochemical terminology in the health sciences..
- Demonstrate the ability to base the scientific principles that support the intervention of the dietitian nutritionist, subjecting their professional performance to scientific evidence.
- Demonstrate the ability to maintain and update professional competence, with special emphasis on learning, autonomously and continuously, new knowledge, products and techniques in nutrition and food, as well as the motivation for quality.

3. Syllabus

THEORY (50hr)

I. PHYSICOCHEMICAL FUNDAMENTALS OF BIOMOLECULES: 7 Topics. (Life. Atoms, bonds and molecules. Water.

Weak interactions. Organic compounds. Chemical reactions. Bioenergetics)

II. COMPOSITION, STRUCTURE AND FUNCTIONS OF MACRONUTRIENTS: 7 Topics. (Proteins (3T). Carbohydrates Fibre. Lipids. Nucleic acids).

III. REGULATORY NUTRIENTS: 5 Topics. (Vitamins (2T). Minerals (3T)).

LABORATORY PRACTICES (17,5hr on-site)

P1. Laboratory introduction. Dissolutions.

P2. Evaluation of dissolutions.

P3. Titration of an amino acid.

P4. Protein electrophoresis.

- P5. Extraction/separation of plant pigments.
- P6. Detection of reducing sugars.
- P7. Quantitative determination of cholesterol.

PROBLEM SOLVING / 2 SEMINARS (5hr on-site).

4. Academic activities

This subject focuses on the student's assimilation and proper use of the biochemical and molecular concepts that dictate physiological processes (including nutritional). The subject develops activities that include: i) theoretical sessions, ii) practical sessions and iii) problem solving sessions.

The theory provides the essential concepts, the scientific lexicon and a molecular understanding of biological processes that the student must assimilate and learn to use properly.

Practical and problem-solving sessions help the student to use theoretical concepts to solve new situations and to achieve a deeper understanding of previous ones.

5. Assessment system

CONTINUOUS EVALUATION

1) Written exams (75% of the grade): Throughout the semester, written exams with 1 o 2 short questions with different sections will be taken. To pass the subject it is essential to have an average of 5, and one can only be compensated for by having at least a 4. They **will be done without prior notice**.

2) Laboratory practices (15% of the grade): It is essential to perform them in order to pass the subject. The questions and exercises that have been formulated during the session will be solved. Students who do not complete a practice may make it up -by demonstrating their ability to solve the questions and exercises corresponding to such practice in an exam.

3) Seminar problems (10% of the grade): Students will be able to pass this section by attending the seminars in which the use of theoretical concepts in the resolution of practical problems will be developed.

GLOBAL EVALUATION

Students who have not passed continuous evaluation have a global evaluation.

The exams consist of a 30 test questions (30% of the grade) and a section of 7 short questions (70% of the grade). In this second section only correct and relevant answers to the question asked are graded. (75% of the grade)

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6. Sustainable Development Goals

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