Universidad Zaragoza

Year : 2019/20

29239 - Structural Biochemistry

Syllabus Information

Academic Year: 2019/20
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

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lectures, laboratory sessions and problem-solving sessions aiming for students to assimilate and appropriately use biochemical and molecular concepts on which, ultimately, the understanding of physiological (including nutritional) processes rest.

4.2.Learning tasks

This course is organized as follows:

- Lectures (50 hours).
- Laboratory sessions (17.5 hours).
- Problem-solving sessions (4 hours).

4.3.Syllabus

This course will address the following topics:

Lectures

SECTION I. PHYSICOCHEMICAL BASIS OF BIOLOGICAL PROCESSES.

- Unit 1. Life: A chemical function.

- Unit 2. Chemical bonding and molecular structure.
- Unit 3. Water: structure and physicochemical
- properties.
- Unit 4. Weak interactions in aqueous media.
- Unit 5. Organic compounds.
- Unit 6. Chemical reactions in living organisms.
- Unit 7. Bioenergetics.

SECTION II. COMPOSITION, STRUCTURE AND FUNCTIONS OF MACRONUTRIENTS.

- Unit 8. Amino acids, peptides and proteins.
- Unit 9. Protein structure.
- Unit 10. Protein function and nutritional importance of proteins.
- Unit 11.Carbohydrates: structure, function and nutritional importance.
- Unit 12. Carbohydrates: Fiber.
- Unit 13. Lipids: structure, function and
- nutritional importance.
- Unit 14. Nucleotides and nucleic acids: structure and function.
-

SECTION III. REGULATORY NUTRIENTS.

- Unit 15.- Functions and mechanisms of action of water-soluble vitamins.
- Unit 16. Functions and mechanisms of action of fat soluble vitamins.
- Unit 17. Macrominerals.
- Unit 18. Microminerals.
- Unit 19. Trace elements.

Laboratory sessions

- P1. Introduction to laboratory work. Preparation of solutions.
- P2. Rating solutions.
- P3. Use and operation with a pH meter. Titration curve of an amino acid.
- P4. Electrophoresis of serum proteins.
- P5. Starch hydrolysis and determination of reducing sugars.
- P6. Quantitative determination of cholesterol.
- P7. Extraction and separation of plant pigments.

Problem solving

- PSS1 (2hr)
- PSS2 (2hr)

4.4.Course planning and calendar

This course covers 19 theory units, 7 practice sessions and 2 problem-solving sessions (in small groups). There will be 4 lectures sessions per week (lasting 1 hour) and 4 sessions per week of practices and/or problem-solving seminars. On average students will attend one of these practice sessions every week and a half (consult official timetables).

Further information concerning the timetable, classroom, office hours, assessment dates and other details regarding this course will be provided on the first day of class or please refer to the Faculty of Health and Sport Sciences website and Moodle.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=29239&year=2019