

Course Unit: 93507 - General biochemistry

Year 1 Semester 2 ISCED Code: 512 ECTS: 5

Type of Course Unit: Compulsory **Delivery Mode:** Face-to-face **Language of Instruction:** Portuguese

COURSE COORDINATOR: Patrícia Alexandra Dias Brito Palma

HOURS OF WORK

TOTAL HOURS	Contact Hours								Hours in autonomous work
	Theory	Theory and practice	Practical and laboratory work	Field work	Seminar	Internship	Tutorial guidance	Other	
125	30		30						65

Prerequisites (if applicable): Not applicable.

LEARNING OUTCOMES (knowledge, skills and competence)

Learning the fundamentals and general concepts of structure, organization and functioning of living organisms in molecular terms through three main areas: (i) chemical and structural components of living matter (the relationship with its biological function), (ii) study of metabolism (chemical reactions that occur in organisms); (iii) molecular genetics (study of molecules, storage processes and transfers biological information).

CONTENTS

Theoretical component:

- (i) Cellular functions: prokaryotic and eukaryotic;
- (ii) Biomolecules, properties, structures and function in the living organism: proteins, carbohydrates, lipids and nucleic acids;
- (iii) Principles of Bioenergetics, Metabolism and Biosynthesis: carbohydrates; lipids, amino acids and nucleotides.

Practical component:

- (i) Reaction of amino acids identity and quantitation of protein using micro methods and macro methods; enzyme assays;
- (ii) identification tests of carbohydrates according to its structure and functional groups and processes for quantification by chromatographic reactions;
- (iii) separation and quantitation of lipids by extraction and reflux reactions.

DEMONSTRATION OF THE CONTENTS COHERENCE WITH THE COURSE UNIT'S LEARNING OUTCOMES

As a general objective of the unit the students should acquire expertise on levels of organization of living organisms, in order to interpret / predict its changes depending on the characteristics inherent to the systems themselves and the variability of external factors. These valences are acquired by integrating three theoretical knowledge modules: (i) changes in levels of organization in accordance with the complexity of structures and functions of living organisms in an integrated ecosystem; (ii) the study of biomolecules its organization and structural relationship to the function they perform in the body, (iii) learning about the processes of acquisition and transformation of energy in living organisms, as well as synthesis reactions, processes that are essential for cellular maintenance. The practical component aims to develop practical skills and interpretation in the area of biological functioning acquired through laboratory experience.

TEACHING METHODOLOGIES

The teaching methodology integrates expository lectures in order to convey the general concepts of structural and metabolic

biochemistry, along with examples of application to Food Sciences. Practices in the laboratory which main are to carry out a set of practical identification and quantitation of biomolecules constituents of living organisms, practical research literature on-line about matters addressed in practical classes with the intention of achieving the reports of the work in laboratory.

DEMONSTRATION OF THE COHERENCE BETWEEN THE TEACHING METHODOLOGIES AND THE LEARNING OUTCOMES

The teaching methods include lectures to make use of a strategy of interpretive and interactive exhibition of the concepts in which students are involved and applied analysis of case-study. Applies lessons that use laboratory practice of development processes for the identification and quantitation of biomolecules. These types of lessons are consistent with the objectives of the course which aimed to enable students to understand, describe and relate knowledge about the structure and function of biomolecules, metabolism and its regulation in the living organisms.

EVALUATION METHODS

The Theoretical evaluation is obtained by conducting a written test (70%); the evaluation practice is obtained by integrating reporting of results of the practical classes (30%). The student must be admitted to practice to get the theory test. Note the minimum allowable for each element of assessment is 10 values. The assessment of recovery is through a written test.

MAIN BIBLIOGRAPHY

- Campos, L. S. (1998). Entender a Bioquímica – Escola Editora. Lisboa.
- Nelson, D. L. and Cox, M. M. (2000). Leningher. Principles of Biochemistry. Worth Publishers. New York.
- Rawn, J. D. (1989). Bioquímica. Mc Graw Hill – Interamericana de España.
- Weil, J. H. (1983). Bioquímica Geral. Fundação Calouste Gulbenkian, Lisboa.

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