

## Course Unit: 15718 – Analytical Biochemistry

Year 2 Semester 3 ISCED Code: 512 ECTS: 5,0

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

COURSE COORDINATOR: António Manuel Gouveia Carloto

### 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)

Students should:

1. Identify the main applications of Biochemistry in the analysis of human biological samples.
2. Know the theoretical bases of methods and technics used in this area.
3. Choose correctly, for each analysis, the most appropriate methodology and technics.
4. Execute, in a rigorous manner, those technics.

### CONTENTS

1. Applications and fundamentals of Analytical Biochemistry.
2. Human biological samples: Sampling, conservation and quality.
3. Cell culture: Isolation, maintenance and manipulation.
4. Biochemical separation methods: Extract obtainment, chromatographic processes, electrophoretic processes, ultra-centrifugations.
5. Enzymatic determination and enzymatic methods: Enzymatic activity and Influential factors, concentration determination, chemical methods, instrumental methods, enzymes determination, substrate determination.

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

1. Applications and fundamentals of Analytical Biochemistry – (out. 1,2 and 3)
2. Human biological samples – (out. 2 and 4)
3. Cell culture – (out. 2 and 4)
4. Biochemical separation methods – (out. 2 and 4)
5. Enzymatic determination and enzymatic methods – (out. 2 and 4)

## TEACHING METHODOLOGIES

After an introductory lecture of each subject, students will come in close contact with the methodologies and technics of interest in a laboratorial environment, through practical assignments oriented by the teacher.

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

Lecturing – (out. 1 - 3)

Laboratorial assignments – (out. 2 and 4)

## EVALUATION METHODS

Theoretical and theoretical-practical assessment will be made through two intermediate written tests or an exam, with a total weight in the final grade of 60%.

Practical assessment will be made through written reports of the laboratorial assignments elaborated by the students and will have a ponderation of 40% to the final grade.

## MAIN BIBLIOGRAPHY

- Gault, V. A., McClenaghan, N. H. (2009). Understanding Bioanalytical Chemistry: Principles and Applications. John Wiley & Sons – 1<sup>o</sup> Ed.
- Holme, D., Peck, H. (1998). Analytical Biochemistry. Prentice Hall-3<sup>o</sup> Ed.
- Manz, A., Dittrich, P. S. (2015). Bioanalytical Chemistry. Imperial College Press-2<sup>o</sup> Ed.
- Mikkelsen, S. R., Cortón, E. (2015). Bioanalytical Chemistry. Wiley-Blackwell-2<sup>o</sup> Ed.
- Sheehan, D. (2009). Physical Biochemistry: Principles and Applications. Wiley-Blackwell- 2<sup>o</sup> Ed.
- Stryer, S., Berg, J. M. (2002). Biochemistry. W.H.Freeman & Co Ltd – 5<sup>o</sup> Ed.

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