School of Agriculture
Course Unit Syllabus

Level of qualification:
Short cycle (TESP)
Study cycle:
Environmental Protection Systems

Course Unit: **223502** – **Physical-Chemical and Biological Parameters in Environmental Systems**

Year 1 **Semester 1** **ISCED Code: 712** **ECTS: 3,0**

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

COURSE COORDINATOR: António 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	
75		**30**							**45**

Prerequisites (if applicable): Not applicable

LEARNING OUTCOMES (knowledge, skills and competence)

The training unit seeks to reflect the technological level of education in which it is located and seeks students to achieve, among others, the following objectives:

a) Acquire and consolidate knowledge on the structure of matter and chemical bonding.

b) Acquire and consolidate knowledge about solutions and ways of expressing concentration.

c) Acquire and consolidate knowledge about reactions and the concept of chemical equilibrium.

d) Acquire and consolidate the knowledge about pH, acidity and alkalinity of compounds.

e) Acquire knowledge about notions of precipitation and water hardness.

f) Acquire knowledge about the main types of organic compounds.

g) Acquire knowledge about the constitution and functions of the main biomolecules at the cellular level.

h) Acquire knowledge about the main types of microorganisms.

CONTENTS

1 - The atom, subatomic particles and periodic table.

2 - Covalent and ionic bonds; molecular and ionic compounds.

3 - Notions of chemical nomenclature.

4 - Solutions, mass concentration, molarity and mass percentage and volume.

5 - Complete and incomplete reactions; equilibrium constants and the principle of Le Chatelier.

6 - Alkalinity and acidity; strong and weak acids and bases; pH.

7 - Chemical precipitation and hardness.

8 - Organic compounds, hydrocarbons, aromatic compounds, functional groups and families of organic compounds.

9 - Biomolecules: Proteins, carbohydrates, lipids and nucleic acids.

10 - Eukaryotes and prokaryotes cellular structures.

11 - Microorganisms: protozoa, unicellular algae, molds, yeasts, bacteria and viruses.

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

a) - 1,2,3.

b) - 4.

c) - 5.

d) - 6.

e) - 7.

f) - 8.

g) - 9.

h) - 10,11.

TEACHING METHODOLOGIES

The training unit will be taught through the exposition of the subjects by the teacher, questioning and resolution of theoretical-practical exercises by the students.

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

This is a training unit aimed at providing students with basic theoretical knowledge that gives support to other more advanced and applied training units, and in view of the limited number of hours of contact envisaged, we opted for the expositive method consolidating the concepts worked by the resolution of theoretical and practical exercises.

EVALUATION METHODS

The evaluation will be done through a theoretical-practical test, in the interim period, covering all the material taught and worth 100% of the final grade. If the student is unable to approve or wants to raise his grade, he can repeat the test at normal and/or appeal time.

MAIN BIBLIOGRAPHY

In addition of the study elements provided at the e-learning page of the Course (Moodle):

Campos, L. S. (1998), Entender a Bioquímica, 5ª Ed., Escola Editora, Lisboa.

Chang, R. (1994), Química Geral, 5ª Edição, McGraw Hill. Lisboa.

FAO, (Editor). Manual of Food Quality Control -Microbiological Analysis. Vol.4.

Ferreira, W.F.C.; Sousa, J.C.F. & Lima, N. (Editores), (2010), Microbiologia. Lidel, Edições técnicas. Lisboa, Porto.

Gifford, C. (1994), Guia Essencial de Química, Editorial Presença, Lisboa.

Nelson, D. L. and Cox, M. M. (2014), Leningher: Principles of Biochemistry, 6th Edition. Worth Publishers. New York.

Simões, J.A.M., Castanho, M.A.R.B., Lampreia, I.M.S., Santos, F.J.V., Castro, C.A.N., Norberto, M.F., Pamplona, M.T., Mira, L., Meireles, M.M. (2000). Guia do Laboratório de Química e Bioquímica, 1ª Edição, Lidel. Lisboa.

Year of implementation: 2016/2017 | Date of approval by the Technical-Scientific Board: