School of Agriculture
Course Unit Syllabus

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

Course Unit: **223507 – Wastewater - Characteristics and Quality Parameters**

Year 1 **Semester 1** **ISCED Code: 712** **ECTS: 3.5**

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

COURSE COORDINATOR: Adelaide Almeida

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	
87.5		**5**	**35**						**47.5**

Prerequisites (if applicable): Not applicable

LEARNING OUTCOMES (knowledge, skills and competence)

To understand the set of problems raised by wastewater, its environmental and public health impact.

To understand the national and UE legislation on wastewater.

To understand the unit operations and used to treat wastewater.

Acquisition and application of knowledge of processes and technologies used in drainage, treatment and control of wastewater.

CONTENTS

Wastewater. Origin and nature. Pollution sources and their effects. Types of wastewater. Physical, chemical and microbiological parameters used to characterize wastewater. National and Community legislation on waste water. Wastewater disposal.

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

It is necessary, as a first step, that students take a first contact with various biological treatment processes and conditions in which they occur, in the order to understand he different possible systems to use in wastewater treatment. Later students have to know pre-size some unit operations used in wastewater treatment plant , so that the effluent can be discharged in a water body or soil, without deteriorating the quality and according to Portuguese legislation. Brief introduction to wastewater drainage systems and pumping stations, to realize some of the situations that may occur and which influence the subsequent treatment in wastewater treatment plant. These knowledge are fundamental to their competencies as environmental Engineers and required to carry out wastewater treatment plants

TEACHING METHODOLOGIES

Lectures and practical outdoor and laboratory, in which students develop and apply the matters exposed in the classroom. Discussion and analysis of case studies.

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

Learning in this unit is primarily based in practice, i.e. students, after a brief theoretical introduction, apply the acquired knowledge in practical exercises in class and in conducting group work outside the classroom. This methodology allows the evaluation of the learning objectives throughout the process, because the exercises and the work requires greater interaction between students and the teacher, allowing a constant evaluation by the teacher of the knowledge acquired by the student, allowing him to make the necessary adjustments to the methodology.

EVALUATION METHODS

Continuous assessment; group reports of investigation; reports of pratical classes and/or final examination.

MAIN BIBLIOGRAPHY

Metcalf , & Eddy, (2004). Waste Water Engineering: Treatment, Disposal and Reuse (3 ed.). MacGraw-Hill., New York.

Peavy, H.; Rowe, D. and Tchobanoglous, G ,(1985). Environmental Engineering (2 ed.). MacGraw-Hill, New York. Degrémont,(1999). Water Treatment Handbook. 2 vols, (6 ed.). Lavoisier

Publishing. Paris.

Twort, A. C., Ratnayaka, D., D. and Brandt, M. J., (2001). Water Supply, Fifth Edition , Arnold, IWA.

Ramalho, R. S., (1977). Introduction to Wastewater Treatment Processes (2 ed.). Academic Press, New York

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