

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Course	Energy and Environment					
Subject	Water Supply and Treatment Systems					
Academic year	2023-2024	Curricular year	3rd	Study period	1st semester	
Type of subject	Compulsory	Student workload (H)	Total: 168	Contact: 75	ECTS	6
Professor(s)	Helena Maria Martins Simão					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department	(select)	José Carlos Costa Almeida				

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

Provide students with the skills to integrate work teams responsible for project execution, operation and exploitation of Water Treatment Plants for human consumption, as well as doing systems analysis of a water supply both in terms of design and evolution of water quality.

2. PROGRAMME

- 1 – Introduction
- 2 – Base elementes
 - 2.1 - Lifetime or project horizon
 - 2.2 – Study population trends
 - 2.3 – Population distribution and density to consider
 - 2.4 – Water necessities
 - 2.5 – Variations of consumption
- 3 – Adduction
 - 3.1 - General rules on the layout in plan and profile
 - 3.2 - Types of pipes and fittings
 - 3.3 - Economic study of water mains
 - 3.4 - Organs of maneuver and security
- 4 – Reservoirs
 - 4.1 - Classification and purpose of reservoirs according to their function in the system
 - 4.2 - Classification according to the position and location
 - 4.3 - Functional and constructive aspects
- 5 – Water Distribution Systems
 - 5.1 - Layout and type of distribution networks
 - 5.2 - Preconditions for network pipes

	SUBJECT DESCRIPTION	MODELO PED.013.03
---	----------------------------	-----------------------------

- 5.3 - Network pipes and regulatory verification
- 6 – Introduction to the Treatment of Potable Water
- 7 – Quality Standards and Treatment Schemes
- 8 – Microstraining
- 9 – Coagulation / Flocculation
- 10 – Sedimentation
- 11 – Removal of Calcium and Magnesium
- 12 – Filtration
- 13 - Disinfection

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

To give students adequate preparation to work in the domain of water treatment systems, in particular with regard to the operation of water treatment systems and their design, the program of the course includes an approach to water quality standards and treatment schemes, and the most relevant processes involved in treating water consumption (microstraining, coagulation/flocculation, sedimentation, removal of calcium and magnesium, filtration and disinfection) are also treated.

With regard to water supply systems, with the goal of giving students skills in the analysis of water supply systems, the subject deals with the fundamental elements for the design of the systems, and several components that integrate supply systems (water mains, reservoirs and distribution networks).

4. MAIN BIBLIOGRAPHY

- [1] - Marques, Alfeu Sá; Sousa, Joaquim Oliveira, “Hidráulica Urbana - Sistemas de Abastecimento de Água e de Drenagem e Águas Residuais (3ª edição)”. Imprensa da Universidade de Coimbra, 2014.
- [2] - “Regulamento Geral dos Sistemas Públicos e Prediais de Distribuição de Água e Drenagem das Águas Residuais”. Decreto Regulamentar n.º 23/95, de 23 de agosto.
- [3] - Degremont – “Water” (6ª edição). Fundação Calouste Gulbenkian, 1998.
- [4] - Quintela, António Carvalho – “Hidráulica”(6ª edição). Fundação Calouste Gulbenkian, 1998.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Oral presentation of fundamental concepts, using audiovisual media.

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Accompaniment in the realization of exercises and practical analysis of the results. Support and guidance on practical work.

Method of Evaluation:

Frequency / Exam (14 values), divided into a theoretical part (40%) and a practical part (60%);

Practical project work with oral defense (6 Values);

Minimum grade of 25% in all the components of evaluation, include presentation of practical work.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The theoretical content of the course will be transmitted to the students through oral presentation supported by audiovisual means. The consolidation and application of these concepts will be achieved by conducting practical exercises and convenient analysis of results. To give students autonomy in applying the knowledge learned, they will develop practical assignments on water supply systems, which will be guided by the teacher.

The teaching methodology presented will equip students with the skills needed to work within the supply systems and water treatment consumption.

7. ATTENDANCE

No attendance requirements have been established, but it is very recommended.

8. CONTACTS AND OFFICE HOURS

hsimao@ipg.pt.

Office: Laboratório de Hidráulica, Recursos Hídricos e Ambiente

Atendence	wednesday	10 am-11.30 am
	thursday	3 pm – 4.30 pm

DATE

1 de outubro de 2023