POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	**SUBJECT DESCRIPTION**	**MODELO** PED.013.03

Course	**Civil Engineering**					
Subject	**Hydraulics II**					
Academic year	2023-2024	*Curricular year*	2nd	*Study period*	2nd semester	
Type of subject	Compulsory	*Student workload (H)*	Total: 140	Contact: 75	*ECTS*	5
Professor	Nuno Álvaro Freire de Melo					
☒ *Area Coordinator* ☐ *Head of Department* *(select)*	José Carlos Costa Almeida					

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

It is intended to give students a good understanding of basic concepts of hydraulics to provide a sound basis for the different applications in the field of hydraulics.

2. PROGRAMME

Flow in Pressure Ducts.

- Pipe-flow systems: different types of problems.
- Pipe networks. Hardy-Cross method

Pumps.

- Introduction and classification
- Centrifugal pumps
- Pumps in series and parallel

Open Channel Flow.

- Introduction. Types of flows.

Permanent flows.

Uniform and non-uniform flow

Specific energy and critical depth

Gradually varied flow

The hydraulic jump.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Through the syllabus and teaching methodology, this curricular unit aims to contribute to the education of the student as an individual and as a future professional, making them aware of the need to know about knowledge, to know how to be and how to behave as well as to know how to do. The course

contents are intended to provide basic training in fluid mechanics and hydraulics, which engineers need for planning, design and management of water systems and water use.

4. MAIN BIBLIOGRAPHY

Teacher Notes (in electronic form and / or paper and / or Blackboard).

Quintela, António Carvalho (1998, 6ª ed) - Hidráulica. Fundação Calouste Gulbenkian, Lisboa.

Lencastre, A. (1996) - Hidráulica Geral. Edição do Autor, Lisboa.

Manzanares, A. A. (1980) - Hidráulica Geral. Técnica – AEIST, Lisboa.

Douglas, J. F., Gasiorek, J. M., Swaffield, J. A. (1985, 2ª ed) – Fluid Mechanics. Longman Scientific & Technical, John Wiley & Sons, Inc. New York.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

To achieve the objectives, the proposed methodology in the course is based on

Monitoring resolution of practical exercises and analysis of results. Support and guidance in carrying out the laboratory work.

The student evaluation is also available for examination (normal time and last assessment). In any evaluation methodologies, for approval, student must obtain a minimum of 10 points (0-20 scale values).

All the tests of assessment have a minimum of 25% in theoretical and practical parts.

Ratings above 16 (range 0-20) will have to be defended in oral examination.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

To achieve the objectives, the proposed methodology in the curricular unit is based on principles of theoretical and practical training.

The methods and teaching techniques, using the affirmative method through technical lectures, demonstration and group interaction, with the teacher's responsibility focused on reinforcing learning and coordination, to contribute to the development of personal training and skills acquisition techniques taught in the domain of fluid mechanics.

7. ATTENDANCE

Students wishing to undergo evaluation by frequency must have attended at least 75% of classes taught. For the performance of Laboratorial works, the presence of student is mandatory.

8. CONTACTS AND OFFICE HOURS

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Office Hours

Thursday: 11:00H às 12:30H

Friday: 10:00H às 12:30H

9. OTHERS

In the classroom (and in all school spaces) safety and operating standards must be respected. In the Laboratory of Hydraulic, Water Resources and Environment, all recommendations associated with the work to be carried out, should also be complied.

DATE

1 de março de 2024

SIGNATURES

Professor

(signature)

Area Coordinator

(signature)