

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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<i>Course</i>	Topographic Engineering					
<i>Subject</i>	General Hydraulics					
<i>Academic year</i>	2023-2024	<i>Curricular year</i>	2nd	<i>Study period</i>	1st semester	
<i>Type of subject</i>	Compulsory	<i>Student workload (H)</i>	Total: 182	Contact: 75	<i>ECTS</i>	6.5
<i>Professor(s)</i>	Nuno Álvaro Freire de Melo					
<input checked="" type="checkbox"/> <i>Area/Group Coordinator</i> <input type="checkbox"/> <i>Head of Department</i>	<i>(select)</i>		José Carlos Costa Almeida			

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

It is intended to provide students with skills that allow them to systematize and apply the acquired knowledge to practical generic issues that are the object of further development in Hydraulic Infrastructures and Water Resources.

Students will learn the main properties of fluids, classify fluid movement and develop practical applications related to hydrostatics (hydrostatic pressure balance and analysis of the behavior of flat and curved floodgates) and hydrodynamics (calculation of losses of loading in piping and analysis of pressure piping systems). They will also be able to analyze open channel flow systems.

2. PROGRAMME

Fluid Mechanics Introduction.

Properties of Fluids.

Hydrostatic.

Hydrostatic law of pressures.

Hydrostatic impulsions on surfaces.

Hydrostatic impulsion on immersed and floating bodies.

Hidrocinemática.

Trajectories and current lines.

Flow rate, flow tube, average velocity.

Continuity equation.

Concepts and Principles of Hydrodynamics.

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Bernoulli's equation.

Power line and piezometric.

Piezometric tube and Pitot tube.

Global Study of Fluid Flow.

Bernoulli's Theorem for perfect liquids and applied to real liquids.

Hydraulic power. Pumps and turbines.

Liquid jets in the atmosphere.

Laws of Resistance of Uniform Flows.

Reynolds number. Experience Reynolds.

Laminar flows or Hagen-Poiseuille.

Turbulent flow in pipes commercial.

Flow in Pressure Ducts.

Head losses along pipes.

Localized head losses.

Open Channel Flow.

Types of flow.

Study of permanent flows.

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

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

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[2] - Helena Simão (2006) – Sebenta de Hidráulica II. Edição IPG, Guarda.

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

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

[5] - 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)

Oral presentation of fundamental concepts, using audiovisual media.

Accompaniment in the realization of exercises and practical analysis of the results. Support and guidance in carrying out the practical works.

Method of Evaluation:

Frequency - 2 frequencies (7,0 + 9,0 values)
- 2 laboratory works (1.4 + 1.3 + 1.3 values)

Exam - A written test 16 values
- 3 laboratory works (1.4 + 1.3 + 1.3 values)

Exam of Resource - A written test 20 values

The frequency, exam and resource exam, are composed of a theoretical part and a practical part, for the student have approval in the discipline, is required to obtain a minimum of 25% in each part.

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 area of fluid mechanics.

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7. ATTENDANCE

No attendance requirements have been established.

8. CONTACTS AND OFFICE HOURS

Nuno Álvaro Freire de Melo
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Tel.: 271220120, Ext.: 1270
Office N.º 70

Horário de Atendimento:

Wednesday : 14:30H - 15:30H

Wednesday : 18:30H - 19:30H

Thursday : 09:30H - 10:30H

Friday : 14:00H - 15:00H

DATE

23 de outubro de 2023