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

Course	**Mechanics and Industrial Informatics**					
Subject	**Applied Physics**					
Academic year	2023/2024	*Curricular year*	1st	*Study period*	1st semester	
Type of subject	Compulsory	*Student workload (H)*	Total: 162	Contact: 75	*ECTS*	6
Professor(s)	Jorge Fonseca e Trindade					
☒ *Area/Group Coordinator* ☐ *Head of Department* *(select)*	Fernando Pires Valente					

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

Acquire structural knowledge of Newtonian mechanics and essential skills for the study and analysis of motion and rest of bodies, their evolution over time under the action of forces, and the subsequent effects on the environment. The student should be able to analyse, from an application perspective, a wide spectrum of concepts from material point mechanics to rigid body mechanics, passing through the mechanics of the material point system.

2. PROGRAMME

Material point mechanics: Kinematics; Newton's Laws applied to translational and rotational motions; Equilibrium of an extended body.

Electricity and magnetism: electric charges and electric fields; Gauss' law; Ohm's law; magnetism and magnetic fields; Biot-Savart law; electromagnetic induction.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The first chapter (mechanics of the particle) borders the foundations and the fundamental principles of classical mechanics, in a comprehensive prospect, particularly related to the movements and their causes.

The second and third chapters, mechanical of the point's system materials and the rigid body, respectively, present as an application of context of knowledge acquired in the previous chapter, in particular about the behaviour of dynamic systems with different configurations.

4. MAIN BIBLIOGRAPHY

Trindade, J. (2014). Mecânica do Ponto Material. Guarda: IPG

Breithaupt, J. (2018). Física. Editora LTC.

Villate, J. (2019). Dinâmica e Sistemas Dinâmicos. Disponível em: https://def.fe.up.pt/dinamica/

OpenStax, (s.d.). University Physics, Volume 1. Disponível em: https://openstax.org/details/books/university-physics-volume-1.

Schiller, C. (s.d.). Motion Mountain – Volume 1: Fall, Flow and Heat. Disponível em: https://www.motionmountain.net/contents.html.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

The teaching methodology will be achieved through the implementation of lectures (predominantly theoretical and theoretical-practical) and interactive/demonstrative cases (in laboratory context). The assessment will consist of theoretical-practical tests (80%) and practical activities (20%).

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

The teaching methodologies proposed are based on three arrays of action, which define the space of modus operand: theory, analysis, and practice. In the first case we bring to light the key concepts, the relationship between them and their conditions of validity. In the second case, we stimulate the application of knowledge and critical analysis in case studies. Finally, through practical demonstrations and laboratory activities, will be offered conditions for the transfer of knowledge to real situations.

7. ATTENDANCE

A minimum attendance of 60% to classes is mandatory.

8. CONTACTS AND OFFICE HOURS

Contacts:

Jorge Fonseca e Trindade: jtrindade@ipg.pt

Fernando Pires Valente: fpvalente@ipg.pt

DATE

18 de setembro de 2023

SIGNATURES

Professor(s), Area/Group Coordinator or Head of Department signatures

Professor

(signature)

Area/Group Coordinator

(signature)

Assinatura na qualidade de (clicar)

(signature)

Assinatura na qualidade de (clicar)

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