

Course Unit	Physics			Field of study	Physics		
Bachelor in	Food Engineering			School	School of Agriculture		
Academic Year	2022/2023	Year of study	1	Level	1-1	ECTS credits 6.0	
Туре	Semestral	Semester	1	Code	9087-641-1103-00-22		
Workload (hours)	162	Contact hours	T - TP T - Lectures; TP - Lectures and	- PL - T	C - S - solving, project or laboratory; TC -	Fieldwork; S - Seminar; E - Placement; C	O - DT - Tutorial; O - Other

Name(s) of lecturer(s)

Amilcar Manuel Lopes António

- Learning outcomes and competences
- At the end of the course unit the learner is expected to be able to: 1. Recognize the importance of some fundamental laws of physics to explain some phenomena. Make the connection between these laws to explain some simple technological applications.
- Recognizing the importance of different systems of units, measurements, accuracy and precision. Distinguish and quantify vector and scalar quantities.
 Determine positions, speeds and accelerations. Calculate forces and moments.
 Understand different properties of some fluids. Calculate densities and pressures. Determine pressure values at different points. Calculate flux values, speed and pressure fluids flow.
- 5. Acquire the basic notions of temperature, heat transfer and heat.
 6. Determine electrostatic force values and electric fields. Quantify electric current and its effects. Determine field values and magnetic force. Quantify induced voltages and current.

Prerequisites

Before the course unit the learner is expected to be able to: Mathematics, Physics or Chemistry at the level of Secondary Education.

Course contents

1. Introduction: measurements; units; vectors 2. Mechanics 3. Fluid Mechanics 4. Thermodynamics 5. Electricity and Magnetism

Course contents (extended version)

1. Introduction

- Measurements; units; vectors 2. FLUIDS

 - Density, Viscosity, Surface Tension, Capillarity. Pressure.
 Fundamental Law of Hydrostatics. Pascal's Principle, Archimedes' Principle.
 Volumetric and Mass Flow. Continuity Equation, Bernoulli's Equation.
- Real Fluids: Poiseuille's Equation; Reynolds Number. 3. THERMODYNAMICS
 - Zeroth Law and Temperature
 - First Law
- First Law
 Second Law and Entropy
 carnot cycle and thermal machines efficiency
 ELECTRICITY AND MAGNETISM
 Electric Charge. Electrical Force. Electric Field. Potential. Potential energy.
 Voltage, Current, Electric Resistance. Simple Electric models: Kirchoff's laws.
 Magnetic field and electric current: Biot-Savart's Law. Magnetic force: Lorentz's equation.

 - Magnetic flux and magnetic induction: Faraday's Law.

Recommended reading

- "Física textos e problemas" (www. esa. ipb. pt/grupofis). A. L. ANTÓNIO
 Haliday D., Resnick R. e Walker; Fundamentos de Física; Volumes 1, 2 e 3. Livros Técnicos e Científicos Editora S. A.
 Alonso M., Finn E. J.; Física; Addison-Wesley
 Haliday D., Resnick R., Walker J.; Fundamentals of Physics, John Wiley

Teaching and learning methods

Presentation of fundamental concepts in the proposed content. Resolution of some numerical problems and conducting some experiments, by the teacher and others in collaboration with the students.

Assessment methods

- Alternative 1 (Regular, Student Worker) (Final, Supplementary, Special)
 Final Written Exam 60%
 Intermediate Written Test 40%

Language of instruction

The stars also used to be the

1. Portuguese

2. Portuguese, with additional English support for foreign students.

Electronic validation					
Amilcar Manuel Lopes António	Felícia Maria Silva Fonseca	Elsa Cristina Dantas Ramalhosa	Maria Sameiro Ferreira Patrício		
05-12-2022	06-12-2022	07-12-2022	19-12-2022		

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