Course Unit	Linear Algebra and Statistics			Field of study	Mathematics and statistics		
Bachelor in	Food Engineering			School	School of Agriculture		
Academic Year	2023/2024	Year of study	1	Level	1-1	ECTS credits	6.0
Type	Semestral	Semester	2	Code	9087-641-1201-00-23		

Workload (hours)	162	Contact hours	T	TP	PL	TC	S	E	OT	O
			-	-	-	-	-	-	-	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Luísa Maria Lopes Pires Genésio

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Understand the basis of linear algebr
2. Use some reference tools to apply basic concepts of statistics in concrete situations.
3. Formalize and implement correctly problems involving the result of random experiences.
4. Do a correct sampling. Characterize data. Apply statistic methods. Interpret the results

Prerequisites

Before the course unit the learner is expected to be able to:
Not applicable

Course contents

Basic notions of Algebra: Determinants, Matrices, Systems of Linear Equations; Descriptive statistics; Probability theory; Random variables; Probability Distribution Functions.

Course contents (extended version)

1. Determinants
   - Theorem of Laplace
   - Rule of Sarrus
   - Properties of determinants
   - Reduction to the triangular form.
2. Matrices
   - Basic concepts
   - Operations with matrices
   - Calculation of the inverse matrix
3. Linear Equation Systems
   - Rule of Cramer
   - Method of elimination of Gauss and Gauss-Jordan
4. Descriptive Statistics
   - Introduction
   - Statistics objectives
   - Types of data and measurement uncertainties
   - Population and sample
   - Statistics and cenral tendency measures
   - Dispersion measures
   - Graphical presentation of the frequency table
   - Other statistics
5. Probability Theory
   - Basic notions
   - Probability
   - Frequency distributios
   - Random variables
6. Probability Distribution
   - Introduction
   - Discrete distributions
   - Hypergeometric Distribution
   - Binomial distribution
   - Poisson distribution
   - Continuous distributions
   - Gauss distribtion

Recommended reading

1. Ferreira, M. , & Amaral, I. (2018). Álgebra Linear: Matrizes e determinantes, Vol. I. Edições Sílabo.
2. Guimarães, R. , & J. Cabral , J. (2010). Estatistica. Verlag Dashöfer Portugal.
3. D'Hainaut, L. (1997). Conceitos e Métodos da Estatistica. Vol. I. Fundação Calouste Gulbenkian.

Teaching and learning methods

Expositive, demonstrative and interactive

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final)
   - Intermediate Written Test - 50%
   - Final Written Exam - 50%
2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100%

Language of instruction

Portuguese

Electronic validation

Luísa Maria Lopes Pires Genésio	Carlos Manuel Mesquita Morais	Elsa Cristina Dantas Ramalhosa	Paula Sofia Alves do Cabo
17-01-2024	17-01-2024	18-01-2024	23-01-2024