

STATISTICS I

Degree(s)	: Management
Type	: Compulsory course unit
Curricular year/semester	: 2nd year - 1st Semester
ECTS / hours per week	: 6 ECTS / 5.0 Hours
Workload per week	: 2 Theoretical x 1.5 Hours + 1 Practical x 2 Hours
Teacher responsible	: Professor Graça Maria Justina Leão Fernandes

OBJECTIVES

- To provide basic knowledge on Probability and on some of its statistical applications;
- To provide the students with the necessary skills to read and work statistical data.
- To solve simple problems with application to economics and management.

PROGRAM

1. Probability
 - 1.1 Introduction
 - 1.2 Space spaces - events
 - 1.3 Measure of probability. Kolmogorov axiomatic.
 - 1.4 Interpretations of the concept of probability
 - 1.5 Combinatorial Methods.
 - 1.6 Conditional Probability. Bayes Theorem
 - 1.7 Independent Events
2. Random variable. Distribution function
 - 2.1 Random variable
 - 2.2 Probability Distributions.
 - 2.3 Classification of random variables
 - 2.4 Functions of a random variable
 - 2.5 Two-dimensional random variables

- 3. Expected values and parameters
 - 3.1 Expected Value of a random variable
 - 3.2 Moments
 - 3.3 Parameters of order
 - 3.4 Moment Generating functions
 - 3.5 Expected value and moments of two dimensional random variables

- 4. Discrete distributions
 - 4.1 The discrete uniform distribution
 - 4.2 The Bernoulli and binomial distribution
 - 4.3 The Poisson Distribution

- 5. Continuous distributions
 - 5.1 The Uniform distribution
 - 5.2 The Normal Distribution
 - 5.3 The Exponential, Gama and Chi-Square Distributions
 - 5.5 Central Limit Theorem

- 6. Sampling distributions
 - 6.1 Probability and statistical inference
 - 6.2 Specification
 - 6.3 Statistics
 - 6.4 The sampling distributions
 - 6.5 The distribution of the sample mean and variance.
 - 6.6 Asymptotic sampling distributions
 - 6.7 Sampling distribution of the proportion in Bernoulli's population.
 - 6.8 Sampling of Bernoulli's population. Case of two proportions
 - 6.9 Normal Population: distribution of mean
 - 6:10 Normal Population: distribution of the variance
 - 6:11 Normal Population: ratio of "Student "
 - 6:12 Normal populations: the difference between two means
 - 6:13 Normal populations: relationship between two variances

BIBLIOGRAPHY

Recommended Bibliography:

- Miller & Miller, John E. Freund's Mathematical Statistics with applications, 8th Edition, Pearson, 2013

Optional Bibliography:

- Hogg, R.V. and Tanis, EA, Probability and Statistical Inference, 6th Edition, Prentice - Hall, 2001
- Newbold, Carlson and Thorne, Statistics for Business and Economics, 8th Edition, Pearson, 2013