

**ECTS - Instituto Superior de Contabilidade e Administração do Porto****DEGREE** Accounting, Marketing, and International Commerce**Designation**

Statistics II

**Annual**  **Semestral**  **Optional**  **Compulsory** **Year** 2nd **Semester** 2nd **Hours/Year****Hours/Week****L** - Lectures**TP** - Theory/Practice 3**Credits****P** - Practice**Objectives of the Discipline**

To offer a balanced presentation of fundamental statistical concepts and methods, along with practical advice on their application to real world problems. All statistical methods developed are illustrated with relevant examples. The prerequisites are a course in differential and integral calculus and another introductory statistical course.

**Programme of the discipline**

1. Continuous probability distributions.
  - 1.1. Uniform distribution.
  - 1.2. Normal distribution.
  - 1.3. Applications of the normal distribution.
  - 1.4. Exponential distribution.
  - 1.5. Chi-square distribution
  - 1.6. t-distribution.
  - 1.7. F-distribution.
  - 1.8. Calculation of probability using Excel.
2. Sampling and Sampling distributions.
  - 2.1. Introduction.
  - 2.2. Random sampling.
  - 2.3. Sampling distributions.
    - 2.3.1. Sampling distributions of means, central limit theorem and applications.
    - 2.3.2. Sample variance distribution.
    - 2.3.3. Sampling distribution for proportions.
  - 2.4. Generating realizations of random variables using Excel.

3. Estimation.
  - 3.1. Introduction and statistical inference.
  - 3.2. Classical methods of estimation.
    - 3.2.1. Estimate, estimator and properties.
    - 3.2.2. Point estimation and interval estimation.
  - 3.3. Estimating the mean and the difference between two means.
  - 3.4. Estimating a proportion and the difference between two proportions.
  - 3.5. Estimating the variance and the ratio of two variances.
  - 3.6. Estimating parameters using Excel.
4. Hypothesis testing.
  - 4.1. Introduction, notation, statistical hypotheses and testing method.
  - 4.2. Hypothesis testing for means (known and unknown variance.)
  - 4.3. Relationship to confidence interval estimation.
  - 4.4. Testing the difference between two means.
  - 4.5. Testing proportions.
  - 4.6. Testing variances.
  - 4.7. Using Excel in tests of hypotheses.

## Methods

The statistical theory is introduced providing examples and an explanation of how Excel can be used in problems solving. Homework exercises are suggested and some are solved in class.

## Assessment

The assessment is based on homeworks, a midterm test, and a final exam.

**Bibliography**

Pedrosa, Antonio Carvalho, and Silvio M. Gama, "Introdução Computacional à Probabilidade e Estatística", Porto Editora (2007).

Levin, Richard, and David S. Rubin, "Statistics for Management", 7th Edition, Prentice-Hall International (1998)..

**Comments**

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