

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	430 - Bachelor's Degree in Electrical Engineering
ECTS	6.0
Course	2
Period	Half-yearly
Subject Type	Basic Education
Module	---

1.Basic info**1.1.Recommendations to take this course****1.2.Activities and key dates for the course****2.Initiation****2.1.Learning outcomes that define the subject****2.2.Introduction****3.Context and competences****3.1.Goals****3.2.Context and meaning of the subject in the degree****3.3.Competences****3.4.Importance of learning outcomes****4.Evaluation****5.Activities and resources****5.1.General methodological presentation**

The methodology proposed for this subject is to promote the continued work in the student focuses on both actual data treatment and the introduction of the fundamental aspects of Statistics. In sessions with the whole group theoretical aspects are based in the form of master class complemented by its application to solving real problems. Treatment with actual data is done in sessions in the computer lab where you learn to manage statistical computer programs.

5.2.Learning activities

The course is divided into four hours of class a week for 15 weeks. Two hours are for exposure of theoretical concepts

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and examples, in the complet group, and the other two hours to develop skills in planning, resolution and interpretation of realistic problems, in the lab class.

A problem is proposed a each student for to resolve. In addition throughout the course application proposed in a real case of the techniques presented . This activity will take place continuously during the course, making periodic reviews .

5.3.Program

Module 1: Exploratory Data Analysis.

1. Exploratory analysis of a variable. descriptive measures and graphical tools
- 2.- Fitting distributions. Calculation of percentiles and probability plots
3. Exploratory analysis of several variables. Linear regression

Module 2: Probability and Random Variables

1. Introduction to the probability. Definition of probability. Bayes theorem. Independence
2. Random variables: Definition of random variable: discrete and continuous. Probability function. Density function. Distribution function. Characteristics of a random variable: mean, variance, skewness and direction. Chebychev inequality
3. Discrete variables: Binomial, Hypergeometric, Geometric, Negative Binomial and Poisson
4. Continuos variables: Uniform, Normal, Exponential, Gamma, Weibull
5. Poisson Process
6. Multivariate probability models

Module 3: Sampling, estimation and hypothesis test.

1. Simple random sample. Statisticians. Distributions Pearson chi-square, Student's t and Snedecor F-Fisher. central limit theorem. Fisher theorem. Calculation of sample sizes
2. Point and interval estimation. Confidence interval estimation. Confidence intervals for means, variances and proportions.
3. Hypothesis test: null and alternative hypotheses. critical region. Type I and II errors. Significance level of contrast and power. Relationship between confidence intervals and hypothesis testing. Hypothesis of means, variances and proportions. Contrasts associated with quality control: graphics \bar{X} , S, contingency tables. Contrast independence.

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Contrast goodness of fit. Analysis of variance of a factor

Module 4: Introduction to Optimization. Optimization problems: decision variables, objective function and constraints. Linear programming problems: graphic resolution

5.4.Planning and scheduling

Master class: 30 h .

Resolution of case studies in computer lab : 30 h .

Making report on a real case with group work : 15 h .

Personal study of theoretical aspects : 30 h.

Troubleshooting: 34 h.

Evaluation Activities : 6 h.

5.5.Bibliography and recommended resources

Bibliography can be found in <http://psfunizar7.unizar.es/br13/eGrados.php?id=220>