26813 - Statistical Methods for Optics and Optometry

Información del Plan Docente

Academic Year	2016/17
Academic center	100 - Facultad de Ciencias
Degree	297 - Degree in Optics and Optometry
ECTS	6.0
Course	2
Period	Second semester
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

Professors will provide sufficient material of interest in order that the student can find real (or close to real) applications of statistics.

Ongoing work will be motivated.

Lecture sessions with the whole group in which the main concepts will be presented, together with some problems in which these concepts will be applied.

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Into the previous lecture sessions the main difficulties arising to the students in the resolution of the problems and questions proposed will be discussed, trying to detect the main errors in the resolutions, as well as which questions have been solved satisfactorily.

Practical classes with few students, developed in computer labs, to analyze data coming from real problems, as well as simulation studies, in order that the student can understand the basic properties explained (without proof) in the lecture sessions.

Tutorial sessions to discuss issues concerning difficulties in the learning process, to correct ways of working, to monitorize the practical work assigned to the student, etc...

5.2.Learning activities

Two hours per week of lectures with the whole group. The students will be provided previously with lecture notes with the main concepts and simple illustrative examples.

Two hours per week of practical sessions in computer lab. The students will be provided previously with scripts for these sessions as well as with the simulation experiments to be developed in class.

Problem solving sessions. Previous lists of problems will be delivered to the student.

Individual coaching, personal study and work, work in groups, etc...,

5.3.Program

The thematic parts of the subject are the following:

Part 1. (5 weeks) Introduction to Statistics. Types of studies, of data, of posible variables. Descriptive numerical and graphical analysis of a statistical variable. Bivariate analysis: Independence-association, correlation, regression.

Part 2. (4 weeks) . Games of chance. Probability and basic rules. Conditional probability and independece. Probabilistic model. Random variables and vectors. Characterization of their probability distribution. Law of large numbers and Central Limit Theorem. Discrete and continuous models more relevant.

Part 3. (6 weeks) Population and sample. Random sample. Statistical model for a data set. Point and interval estimation of parameters. Hypothesis testing. Comparisons of two groups: t tests and Rank tests. Inference with categorical data. Computation of sampling size

5.4.Planning and scheduling

The Schedule of lectures and practical sessions will be previously announced in the web page of the faculty, as well as the web page of the course.

A mid-term exam will be done. The exam date will be previously announced through the web page of the course.

5.5.Bibliography and recomended resources

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BB	Devore, Jay L.. Probabilidad y estadística para ingeniería y ciencias / Jay L. Devore . 6ª ed. México [etc.] : International Thomson Editores, cop. 2005
BB	Horra Navarro, Julian de la. Estadística aplicada / Julián de la Horra Navarro . - 3ª ed. Madrid : Diaz de Santos, 2003
BB	Libro blanco de la visión en España [2009] / Visión y Vida, FEDAO Madrid : Visión y Vida, 2009
BB	Moore, David S.. Estadística aplicada básica / David S. Moore . - 2ª ed. Barcelona : Antoni Bosch, D.L. 2005
BB	Peña Sánchez de Rivera, Daniel. Fundamentos de estadística / Daniel Peña . - 1ª ed., 1ª reimp. Madrid : Alianza, 2005