

Academic Year: ( 2020 / 2021 )

Review date: 07-07-2020

Department assigned to the subject: Department of Statistics

Coordinating teacher: MOLINA PERALTA, ISABEL

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Social Sciences and Law

**COMPETENCES AND SKILLS THAT WILL BE ACQUIRED AND LEARNING RESULTS.**

In today's world there is an enormous amount of information available. There are diverse sources and many of them are accessible through the Internet. To analyze this information and draw valid conclusions we need to use specific techniques. The most widely used and successful technique are based on Statistics. In this course we will learn how to obtain information from the data with techniques that you will use both in your studies and in your professional career, because these techniques are commonly used by most companies and organizations.

Today a statistical analysis is inconceivable without computer resources. Therefore the teaching of Statistics will rely heavily on computer laboratories.

After completing this course, you should be able to extract information from the data and draw scientific conclusions, and to express those conclusions in a written report. Also, you can establish relationships between variables using the regression model and to interpret the model properly.

**DESCRIPTION OF CONTENTS: PROGRAMME**

1. Introduction. Studying statistical problems
2. Descriptive statistics
  - 2.1. Types of data: Quantitative and qualitative
  - 2.2. Types of data: cross-sectional and time series
  - 2.3. Graphs: histogram, box plot, piechart, barchart, sequence of a series
  - 2.4. Centrality and dispersion measures.
  - 2.5. Relationship between variables: Correlation and scatterplot
3. Simple regression
  - 3.1. Introduction.
  - 3.2. Hypothesis: linearity, homoscedasticity, independence and normality
  - 3.3. Transformations if the hypothesis are not met: Logarithmic transformation
  - 3.4. Estimation. Confidence intervals for the coefficients, the concept of significance and t test. P- value of the t. Test
  - 3.5. R-squared
  - 3.6. Diagnosis
4. Multiple regression
  - 4.1. Introduction.
  - 4.2. Hypothesis: linearity, homoscedasticity, independence and normality
  - 4.3. Transformations if the hypothesis are not met: Logarithmic transformation
  - 4.4. Estimation. Confidence intervals for the coefficients, the concept of significance and t test. P-value of the t. Test
  - 4.5. Marginal effects
  - 4.6. R-squared
  - 4.7. Diagnosis
5. Multicollinearity in multiple regression
  - 5.1. Introduction
  - 5.2. Multicollinearity Detection
  - 5.3. Treatment
  - 5.4. Strategy for variable selection
  - 5.5. Stepwise model
6. Dichotomous Variables.
  - 6.1. Introduction of qualitative variables in a regression model
  - 6.2. Creating qualitative dichotomous variables
  - 6.3. Estimation and interpretation of results
7. Polytomous variables

- 7.1. Introduction of qualitative variables in a regression model
- 7.2. Creating qualitative polytomous variables
- 7.3. Estimation and interpretation of results
- 8. Accessing databases
  - 8.1. Access and use of INE data
  - 8.2. Access and use of CIS data.
- 9. Project

#### LEARNING ACTIVITIES AND METHODOLOGY

Theory (4ECTS). Lectures with support material available via web.  
Practices (2ECTS). Computer labs. Debates.

#### ASSESSMENT SYSTEM

Homework, partial exams and/or project (40%)  
Final exam (60%)

<b>% end-of-term-examination:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

#### BASIC BIBLIOGRAPHY

- Downie, N.H. y Heath, R.W. (1983). Métodos Estadísticos Aplicados., Editorial Del Castillo..
- Mateo Rivas, M.J. (1985). Estadística en Investigación Social., Editorial Paraninfo..
- Peña, D. (1991). Estadística Modelos y Métodos. Tomo I, Fundamentos., Alianza Universidad Textos..
- Peña, D. y Romo, J. (1997). Introducción a la Estadística para las Ciencias Sociales., McGraw-Hill..
- Sierra Bravo, R. (1992). Técnicas de Investigación Social, Teoría y Ejercicios., Editorial Paraninfo..