

## COURSE GUIDE 2019-20

### DETAILS OF THE COURSE

Name:	Advanced Statistics		
Code:	63102202	Studies:	Grade in Economy
Year:	2019-20	Level:	Grade
Course:	2nd	Type:	Compulsary
Semester:	1st Semester		

### TIMING

ECTS Credits:	6
Total Hours:	150
<b>ONLINE LEARNING:</b>	Teaching support

### LECTURERS

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### CONTEXT

#### Main objective of the course

This subject strengthens the approach of statistics as a tool for obtaining and analyzing business information as well as information about the economic and social environment through the treatment and modelling of databases using statistical inference techniques. This way, the procedures included in this subject provide us with methods to infer properties of a population from a small part of it, called sample. This subject also offers the student the opportunity to learn and practice with the statistical software SPSS, which will be used to perform the statistical studies with databases.

#### Previous knowledge

This subject is a continuation of 1st course subject Statistics. Some knowledge of the subject Maths of 1st course is also needed

#### Prior conditions

None

## COMPETENCIES AND OBJECTIVES

### General

#### *UAL transverse competencies*

- Basic knowledge of the profession
- Problem solving skills

#### *Basic competencies*

- Having and understanding knowledge

### Specific competencies

- **AFB02:** Knowing and applying the basic concepts of Statistical Inference
- **FBC12:** Acquiring skills and master computer tools applied to different areas

## LEARNING OUTCOMES

- UAL1: Knowledge, skills and attitudes which facilitate understanding of new theories, interpretations, methods and techniques within different curricular fields, leading to meet the professional requirements.-UAL3: The ability to identify, analyse and define the main parts of a problem in order to solve it rigorously
- RD1: The student must show knowledge and understanding in a field of knowledge that starts from the ESO level, but is in a higher level, supported by advanced text books, and includes some knowledge from that vanguard of the field.
- AFB02: Knowing and understanding of Statistical Inference methods. Analysing statistically a set of data, interpreting the results and drawing conclusions.
- FBC12: Knowing and operating with ease the computer programs for statistical and mathematical analysis.

## CONTENTS

### Syllabus

- **Unit 1: Independence and Distributions of interest.**

1- Independence. 2- Expectation and variance. 3- Reproductivity. 4- Central limit theorem. 5- Normal associated distributions.

- **Unit 2: Samples and statistics**

1- General setting of Inference and basic concepts. 2- Parametric point estimation. 3- Mean square error. 4- Properties: Unbiasedness, relative efficiency and consistency.

- **Unit 3: Confidence intervals and hypothesis tests estimation**

1- General setting of a confidence interval. 2- General methodology to obtain a confidence interval. 3- General setting of a parametric hypothesis test. 4- General methodology to obtain a hypothesis test. 5- Determination of confidence intervals and hypothesis tests of frequent use.

- **Unit 4: Non-parametric hypothesis tests**

1- General setting of the problem. 2- Normality tests. 3- Independence chi-square test. 4- Randomness test. 5.-Mann-Withney and Wilcoxon tests.

- **Unit 5: Analysis of variance**

1- Introduction. 2-The means test. The ANOVA table. 3- Ad hoc comparisons. Analysis of mean differences. 4- Checking previous assumptions. Analysis of residuals. 5- Alternative methods.

- **Unit 6: Linear regression model**

1- Simple linear regression. 2-Multiple linear regression. 3- Checking previous assumptions.

### Methodology and activities

- Lectures.
- Solving exercises.
- Practical lessons with a statistical software.
- Evaluation sessions.
- Preparations of reports.

### Teaching Innovation Activities

- Case study method.
- Cooperative learning.
- Flipped classroom.
- M-learning

## EVALUATION OF THE COMPETENCIES

### Criteria

The total mark of the subject is 10 points, divided this way:

1) **Three points (30%)**, as a maximum can be obtained in the evaluation of the activities proposed during the semester. **(Evaluation of competencies: UAL1, UAL3, RD1, AFB02 y FBC12).**

2) **Seven points (70%)**, as a maximum can be obtained in the evaluation of one test whose contents correspond to the ones that have been dealt with during the previous practical lessons and theoretical-practical exercises to check if the student has reached the objectives. The clarity in the concept understanding, the correct use of the statistical vocabulary and notation and the statistical reasoning skill will be valued. **(Evaluation of competencies: UAL1, UAL3, RD1, AFB02 y FBC12).**

The marks of continuous assessment (1) obtained during the course, will **be maintained for the extraordinary exam in September** and only can be obtained if the assignments are submitted in time. Students neither can retake this part nor ask for its assessment in September call

## Follow up

- On-line platform sign up and access.
- Handing in activities in class.
- Handing in activities through on-line platform.

## **BIBLIOGRAPHY OF THE COURSE**

### Recommended Reading

- Practical Business Statistics -6th edition (Andrew F. Siegel)
- Business Statistics: For Contemporary Decision Making -8th edition (Ken Black)
- Statistics for business and financial economics (Cheng F. Lee, John C. Lee y Alice C. Lee)
- Statistics for business and economics (David R. Anderson, Dennis J. Sweeney, Thomas A. Williams)

### Existing bibliography in the UAL Library System

You can check the existing bibliography in the University Library in the following link: