

## COURSE SYLLABUS

### 1. COURSE DESCRIPTION

<b>Degree:</b>	<b>Administración y Dirección de Empresas (English teaching)</b>
<b>Double Degree:</b>	<b>Derecho y Administración y Dirección de Empresas (English teaching)</b>
<b>Course:</b>	<b>BUSINESS STATISTICS II (Estadística Empresarial II - English teaching)</b>
<b>Module:</b>	<b>Extension in Economics and Statistics</b>
<b>Department:</b>	<b>Economics, Quantitative Methods and Economic History</b>
<b>Term:</b>	<b>First term</b>
<b>Total Credits:</b>	<b>6</b>
<b>Year:</b>	<b>2<sup>nd</sup>/3<sup>rd</sup></b>
<b>Type of Course:</b>	<b>Obligatory</b>
<b>Course Language:</b>	<b>English</b>

<b>Teaching model:</b>	<b>C1</b>	
<b>a. General/Background:</b>		<b>50%</b>
<b>b. Theory-into-practice/developmental knowledge-building:</b>		<b>50%</b>
<b>c. Guided Academic Activities:</b>		

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### 3. ACADEMIC CONTEXT

#### 3.1. Description of Objectives

- Introduce the students into the statistical techniques of data analysis.
- Introduce the students into the use of specific statistical software.
- Make the students be aware of the applicability of these statistical techniques to real life business and economic problems.
- Promote team work.
- Make the students acquire autonomous capacity to solve problems inherent to their professional development.
- Promote discerning capacity to choose the most convenient statistical resources in order to interpret correctly real life economic and business situations.
- Train students' capacity of analysis, synthesis, use of specific vocabulary and presentation of results.

#### 3.2. Contributions to the Training Plan

- Provides the tools and forms the basis for the econometric analysis of real life economic and business problems.
- Is the instrumental basis for other more specific subjects with econometric and statistical contents.

#### 3.3. Recommendations or Prerequisites

It is recommendable to have successfully followed Business Statistics I.

## COURSE SYLLABUS

### 4. SKILLS

#### 4.1 Degree Skills Developed during this Course

- Specific Skills:

- Knowledge and application of the basic concepts of Statistical Inference and the interpretation of their results.

- General Skills:

Systemic skills:

- Performance according to the following criteria: social responsibility, principles of equal opportunities between men and women, principles of equal opportunities and universal accessibility of disabled persons, and the values featuring a culture of peace and democratic values.
- Sensitivity to social and environmental issues.
- Self-Learning capacity.
- Ability to adapt to new environments.
- Creativity.
- Leadership.
- Initiative and entrepreneurship.
- Motivation for quality.

Personal skills:

- Team work.
- Ability for personal relations.
- Critical and logic reasoning.
- Ethical compromise in work.
- Working under pressure (resilience).

Instrumental skills:

- Analysis and synthesis.
- Organization and planning.
- Oral and written communication in English.
- Related knowledge of specific softwares.
- Ability to analyse and search for information from diverse statistical sources.
- Capacity to solve specific problems.
- Capacity to make decisions.

#### 4.2. Module Skills Developed during this Course

##### MODULE II: EXTENSION OF ECONOMICS AND STATISTICS

- Specific Skills:

- Knowledge and application of the basic concepts of Statistical Inference and the interpretation of their results.

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### - General Skills:

#### Systemic skills:

- Performance according to the following criteria: social responsibility, principles of equal opportunities between men and women, principles of equal opportunities and universal accessibility of disabled persons, and the values featuring a culture of peace and democratic values.
- Sensitivity to social and environmental issues.
- Self-Learning capacity.
- Ability to adapt to new environments.
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#### Personal skills:

- Team work.
- Ability for personal relations.
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#### Instrumental skills:

- Analysis and synthesis.
- Organization and planning.
- Oral and written communication in English.
- Related knowledge of specific softwares.
- Ability to analyse and search for information from diverse statistical sources.
- Capacity to solve specific problems.
- Capacity to make decisions.

### **4.3. Course-specific Skills**

Knowledge and application of the basic concepts of statistical data analysis in Business Statistics.

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### 5. COURSE CONTENTS (COURSE TOPICS)

Unit 1: Probabilistic Models: the Normal distribution and the Associated Normal distributions.

- a) Probabilistic Models of continuous random variables: the Normal model.
- b) The Pearson's Chi-Square distribution.
- c) The t-Student distribution.
- d) The F-Fisher-Snedecor distribution.

Unit 2: Sampling distributions

- a) Random sample. Population parameters and sample statistics.
- b) Sample distribution of statistics.
- c) Mean and variance of selected statistics.
- d) Distribution of sample statistics of Normal populations.
- e) Distribution of the sample proportion.
- f) Distribution of the difference in proportions.

Unit 3: Point estimation

- a) Introduction to Statistical Inference.
- b) The problem of estimation: point estimation.
- c) Properties of the point estimates.
- d) Calculation of estimates: method of moments and the maximum likelihood method.

Unit 4: Interval estimation

- a) Construction of confidence intervals.
- b) Confidence intervals in Normally distributed populations
- c) Confidence intervals in other non-normally distributed populations.

Unit 5: Hypothesis testing

- a) Concept and types of hypothesis.
- b) Rejection and acceptance regions.
- c) Types of error.
- d) Steps to follow for running a hypothesis test.
- e) Power and power function of the test.
- f) Parametric tests.
- g) Non-parametric tests.

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### 6. METHODOLOGY AND RESOURCES

- Basic Lectures (max.: 60 students): 15 sessions (22.5 hours)  
Presentation of the theoretical basic aspects of the subject through lectures, conferences, presentations of results (if any) and other presential activities suitable for large groups of students.
- Practice Lectures (max.: 3 groups of 20 students): 15 sessions (22.5 hours)  
These classes include the resolution of problems as a complement to the Basic Lectures. It is highly recommendable to attend these sessions having previously worked at home the theoretical concepts developed during the Basic Lectures. Practice lectures should aim to solve doubts and to have presentations of the students on the solution of previous assignments. In addition, they include presential computer practices in computer rooms for getting the student more familiarized with the specific statistical software (SPSS, MS Excel).
- Time devoted to studying per student: 100 hours.
- Assessment: 5 hours.

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### 7. ASSESSMENT

- Continuous evaluation (30%):

Periodical tests will be carried out. They will evaluate the progress of the student. Also, assignments will be delivered to groups and/or individual students. The tests will form a 25% of the final grade and they cannot be retaken. The delivery of the written assignments and their oral presentation will form 5% of the final grade.

- Computer practices (20%):

There will be computer practices using the statistical softwares SPSS and MS Excel (statistical functions). During these sessions, there will be individual or group assignments that will be evaluated. The last session is devoted exclusively to an individual assessment of the knowledge acquired by the students. Its content will be similar to those of the previous sessions.

- Final exam (50%): A written test will be made at the end of the semester. It will consist of theoretical questions, mixed theory and practice questions and the resolution of a set of selected problems. The main purpose is to check whether the students have acquired the necessary skills.

Minimum grades:

Final exam: 1.75 points out of 5.

Computer practice assessment: 1 point out of 2.

- Resit exam (July):

The resit exam will take place in July for those students that have not approved the subject under the assessment described above. Basic Lectures (50%) will be assessed again and a retake of computer practices (20%) will be allowed for those who failed to do so. The final grade will be the mark obtained in the resit exam plus the mark obtained in the continuous assessment (30%), which can not be retaken.

Mobility students:

The students awarded with any of the official student-mobility programs (Sócrates-Erasmus, SICUE-Séneca, Atlanticus...) and enrolled in the module outside their mobility contracts, can retake for the final grade the share related to the continuous assessment by taking a specific additional test. Such students must communicate this in writing to the lecturers of the module before November 30<sup>th</sup>. Students not fulfilling this deadline can only apply with the written support of the academic coordinator of their mobility contract.

## COURSE SYLLABUS

### 8. REFERENCES

#### **Main references:**

ACZEL, AD. SOUNDERPANDIAN, J. Complete Business Statistics. McGraw-Hill Irwin, 7th edition, 2009.

GROEBNER, DF. SHANNON, PW. FRY, PC. SMITH KD. Business Statistics. Pearson-Prentice Hall, 6th edition, 2004.

#### **Other references:**

BOWERMAN, B.L., O'CONNEL, R.T., HAND, M. L. Business statistics in practice McGraw-Hill/Irwin, 2001.

BURTON, G., CARROL, G. WALL, S., Quantitative methods for business and economics, Prentice Hall, 2<sup>nd</sup> Edition, 2002.

DOANE, D., SEWARD, L. Applied Statistics in Business and Economics, McGraw-Hill/Irwin, 2007.

LIND, D.A., MARCHAL, W.G., WATHEN, S.A., Statistical techniques in business and economics, McGraw-Hill/Irwin, 2004.