

## COURSE SYLLABUS

### 1. COURSE DESCRIPTION

<b>Degree:</b>	
<b>Double Degree:</b>	<b>Derecho y Administración y Dirección de Empresas (English teaching)</b>
<b>Course:</b>	<b>BUSINESS STATISTICS I (Estadística Empresarial I - English teaching)</b>
<b>Module:</b>	<b>Basic Training in Business and Economic Sciences</b>
<b>Department:</b>	<b>Economics, Quantitative Methods and Economic History</b>
<b>Term:</b>	<b>Second term</b>
<b>Total Credits:</b>	<b>6</b>
<b>Year:</b>	<b>2<sup>nd</sup></b>
<b>Type of Course:</b>	<b>Basic</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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### 2. COURSE COORDINATOR

<b>Course coordinator</b>	
<b>Name:</b>	<b>Alfredo García Hernández-Díaz</b>
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<b>Department:</b>	<b>Economics, Quantitative Methods and Economic History</b>
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<b>Name:</b>	<b>María Dolores Caro Vela</b>
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### 3. ACADEMIC CONTEXT

#### 3.1. Course Description and Objectives

This subject intends to initiate students into basic notions about Descriptive Statistics, Probability Calculus and Statistical Inference. The first will include: the development of statistical analysis of real business and economic data, the knowledge of the most popular index numbers (consumer price index, industrial production index, etc.), the introduction to the classic analysis of time series. The latter will include: probability calculus, which intends to obtain a sufficient theoretical basis to develop probabilistic models and inferential methods in the future. Finally, some considerations about main statistical sources of economic data, as its location and searching are studied complementarily. Basic objectives of the subject are to teach students theoretical and practical foundations of statistical analysis and to teach the usage of modern computer techniques (Excel) applied in Statistics. During the subjects constant reference to real business and economic problems will be made, with the objective of assimilating easy and intuitively studied concepts. Another aspect that will be looked at will be the organization and sources of public statistics.

#### 3.2. Contribution to the Training Plan

This module intends to provide the student with the tools for data analysis that let them assess and forecast the behaviour of economic, social and business events. Such learning is completed with suitable IT tools.

#### 3.3. Recommendations or Prerequisites

Basic knowledge of Mathematics I is needed, especially on solving equation systems, optimization and simple-multiple integration.

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### 4. SKILLS

#### 4.1 Degree Skills Developed during this Course

##### Systematic Skills:

- Self-learning
- Creativity
- Ability to adapt to new environments
- 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

##### Instrumental Skills:

- Analysis and synthesis
- Organization and planning
- Usage of Information Technology
- Searching for statistical information
- Defining and solving specific problems about business and economic topics
- Decision Making

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

##### Systematic Skills:

- Self-learning
- Creativity
- Ability to adapt to new environments
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##### Personal Skills:

- Team work
- Ability for personal relations
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##### Instrumental Skills:



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- Analysis and synthesis
- Organization and planning
- Usage of Information Technology
- Searching for statistical information
- Defining and solving specific problems about business and economic topics
- Decision Making

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

- Knowing and applying basic statistical concepts to real business

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### 5. COURSE CONTENT (COURSE TOPICS)

#### Unit 1: ONE-DIMENSIONAL FREQUENCY DISTRIBUTIONS.

1. Statistics: Definition & Objectives. Basic Concepts. Tasks in any statistical research.
2. Frequency Distribution for a characteristic. Graphic Representations
3. Measures of Central & non-Central.
4. Measures of Tendency, Dispersion and Shape.
5. Concentration Measurements: the Gini's Index & the Lorentz's Curve.

#### Unit 2: JOINT FREQUENCY DISTRIBUTIONS. REGRESSION.

1. Joint Frequency Distributions for two characteristics: Correlation and Contingency Tables.
2. Functional and Statistical Dependence.
3. Linear Simple Regression and Correlation. Introduction to Linear Multiple Regression.
4. Non linear fitting.
5. Study of the association of qualitative variables.

#### Unit 3: STATISTICS OF THE BUSINESS WORLD: RATES AND INDEX NUMBERS AND TIME SERIES CLASSICAL ANALYSIS

1. Computation of variations, rates and cumulative average rates.
2. Index numbers: simple and aggregate. Properties.
3. Price Indexes. Quantity Indexes. Properties.
4. Base Change: Renovation and enlace of series of index numbers.
5. Value Indexes and deflation.
6. Consumer Price Index (CPI). Base Change 2001.
7. Time Series: concept and definition of components. Trend determination.
8. Official Sources of Economic Surveys: IEA, INE, EUROSTAT and other organisms.

#### Unit 4: RANDOM EXPERIMENTS AND EVENTS. PROBABILITY.

1. Random phenomena and events.
2. Counting Tools: Combinatory.
3. Probability.
4. Conditional Probability. Bayes' Theorem.

#### Unit 5: RANDOM VARIABLES. PROBABILITY MODELS.

1. Probability Distributions of one-dimensional discrete and continuous. Measures of position, dispersion and shape. Change in scale and in origin. Standardization of a random.
2. Two-dimensional Random Variable. Marginal and conditional distributions. Expectation and covariance. Linear Correlation Coefficient. Independence of Random Variables.

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### 6. METHODOLOGY AND RESOURCES

For the application of the European Credit Transfer System (ECTS), it will be adopted an organization of teaching-learning based in two types:

1. General Teaching (group of at most 60 students): Showing the basic concepts of the subject in lectures, conferences, A/V display and other in class activities suitable for large groups. This part accounts for 50% of the sessions.
2. Practical Teaching (groups of at most 20 students): Theoretical-practical sessions. It will constitute a complement for GT sessions where concepts will be further studied and exercises will be solved to reinforce them. Students presentations and assessments will also take place. It includes 3 computer labs to learn the usage of specific software (MS Excel). This part accounts for the 50% of the subject.

Material resources to be used will be:

- Materials produced by lecturers of the course: Theory notes , lists of problems, lists of problems to be solved with the computer, computer labs guides, etc.
- Room for 60 students
- Room for 20 students
- Computer lab for 20 workstations

In all the previously mentioned rooms should be available a blackboard, video projector and screen and a computer with internet connection.

Computer resources to be used will be:

- Software: PowerPoint; MS Excel.

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### 7. ASSESSMENT

The assessment for this subject will be based on a set of activities on a continuous, formative assessment basis. Each activity will have a different weighting on the final mark, set according to complexity, effort needed and time devoted by the student.

All teaching activities (GT and PT) will be assessed in the following way:

General Teaching Assessment (final exam):

The final exam will take place at the end of the term. It will consist of a set of theoretical questions and problems related to subject contents. Students must show the acquisition of worked competences. The weighting of this part of the assessment on the final mark is 50%.

Practical Teaching Assessment (continuous assessment):

There will be periodical tests to evaluate the progress of the student (the continuous assessment scheme) and the weighting of it on the final mark is 30%.

Three evaluated computer practices will take place. This part will account for the 20% of the final mark. The objective is showing the usage of common statistical software packages (MS Excel). One final computer exam will also take place for those students who did not reach the minimum score.

Minimum scores:

General Teaching Assessment: 1,75 points out of 5

Computer Labs Assessment: 1 point out of 2

To pass the subject the student must obtain at least 5 points out of 10, between scores in General Teaching (50%) and Practical Teaching (50%).

Resit exam (July):

The resit exam will take place in June/July. General Teaching (50%) will be assessed again and a retake of computer labs (20%) will be allowed for those who failed to get the minimum score required. According to University regulations, students are allowed to give up the points obtained throughout the course corresponding to the continuous assessment items (3 POINTS), but then they will have to take an additional exam on the day of the exam. These students will have to send an email to the course coordinator at least 10 days before the day of the exam.

Mobility students:

The students attending any official student-mobility program (Sócrates-Erasmus, SICUE-Séneca, Atlanticus...) and that are enrolled in the module outside their mobility contracts, can retake, for the final mark, the share related to the continuous assessment by a taking a specific additional exam. Such students must communicate this by writing



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to the lecturers of the module before April 30<sup>th</sup>. Students not fulfilling this deadline can only apply with the support of the academic coordinator of their mobility contract.

### 8. REFERENCES

#### GENERAL:

- GROEBNER, DF. SHANNON, PW. FRY, PC. SMITH KD. Business Statistics. Pearson-PrenticeHall, 6th edition, 2004.
- ACZEL, AD. SOUNDERPANDIAN, J. Complete Bussiness Statistics. McGraww-Hill Irwin, 7th edition, 2009
- CASAS SÁNCHEZ, J.M.; SANTOS PEÑAS, J.: Introducción a la Estadística para Economía y Administración y Dirección de Empresas. Ed. Centro de Estudios Ramón Areces, S.A., 2002.
- CASAS SÁNCHEZ, J.M. y COLS.: Problemas de estadística : descriptiva, probabilidad e inferencia. Ed. Pirámide, 1998.

#### SPECÍFIC:

- Statistics For Business And Economics: Student Solutions Manual, 2006
- Statistics for Managers Using Excel and Student CD Package, Prentice Hall, 2008
- Statistics for Business and Economics and Student CD, Prentice Hall, 2006
- Statistics for Business & Economics, Prentice Hall, 2008
- Business Statistics by Example, Prentice Hall, 1996
- Basic Business Statistics, Prentice Hall, 2009
- ActivStats, Addison-Wesley
- ActivStats for Business Statistics, Addison-Wesley, 2010
- Business Statistics, Addison-Wesley, 2010
- Flash Review: Introduction to Statistics, Addison-Wesley, 2002
- How to Lie With Statistics, W. W. Norton & Company, 1993
- The Complete Idiot's Guide to Statistics, Alpha, 2007
- The Cambridge Dictionary of Statistics, Cambridge University press,
- Applied Statistics in Business and Economics with CDRom, , 2007
- Basic Statistics Using Excel and MegaStat w Student CD, , 2008
- Statistical Techniques in Business and Economics, McGraw-Hill Irwin, 2008
- Statistical Techniques in Business and Economics with Student CD, McGraw-Hill Irwin, 2008
- Introduction to Statistics for Executives, McGraw-Hill Irwin,
- Statistical Techniques in Business and Economics with Student CD-Rom, McGraw-Hill Irwin, 2005
- Business and Financial Statistics using Minitab 12 and Microsoft Excel 97, World Scientific Publishing Co, 2000
- Against all odds: Inside Statistics (DVD), W.H. Freeman and Company, 2006
- Introduction to the Practice of Statistics (textbook), W.H. Freeman and Company, 2006
- Introduction to the Practice of Statistics (study guide), W.H. Freeman and Company,



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1992

Statistical Reasoning for Everyday Life, Addison Wesley, 2008

The Cartoon Guide to Statistics, Collins Reference, 1993

Statistics in a Nutshell: A Desktop Quick Reference, O'Reilly Media, Inc., , 2008

Statistical sources:

1. Instituto de Estadística de Andalucía: [www.juntadeandalucia.es/institutodeestadistica](http://www.juntadeandalucia.es/institutodeestadistica)
2. Instituto Nacional de Estadística: [www.ine.es](http://www.ine.es)
3. Oficina Estadística de la Unión Europea: [www.europa.es.int/comm/eurostat](http://www.europa.es.int/comm/eurostat)

Databases:

1. ABI/Informa Global Ed.
2. Business Source Premier.
3. Econ-Lit.
4. International Statistical Yearbook.