

## TEACHING GUIDE OF THE SUBJECT: STATISTICAL INFERENCE

### 1. General data

Subject:	<b>STATISTICAL INFERENCE</b>	CODE:	<b>53315</b>
Typology:	<b>MANDATORY</b>	ECTS credits:	<b>6</b>
Grade:	<b>316 –DEGREE IN ECONOMICS</b>	Academic course:	<b>2016-17</b>
Centre:	<b>(5) SCHOOL OF ECONOMICS AND BUSINESS SCIENCES ALBACETE</b>	Group(s):	<b>10</b>
Course:	<b>2</b>	Duration:	<b>Second term</b>
Main language for teaching:	<b>Spanish</b>	Second language:	<b>English</b>

Professor's name: Esteban Alfaro Cortés ; Group: 10

Office	Department	Phone	email	Tutorials timetable
Melchor de Macanaz 3.14	DHEP	967599200 2175	Esteban.Alfaro@uclm.es	See Web site of the Faculty and Moodle for the subject

Professor's name: Matías Gámez Martínez ; Group: 16 - 17

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### 2. Prerequisites

It is recommended to have coursed the subject on Statistics for Economics

### 3. Justification in the curriculum, relationship with other subjects and the profession

In the economic field, a basic management of the fundamental techniques for the treatment of quantitative information is essential. This need is translated into a knowledge of the main sources of statistical information, the basic rules for its interpretation and Analysis, and a mastery of the most relevant analytical-quantitative instruments. Therefore, the curriculum, within module 4 "Methods Quantitative for the Economy" devotes a section to the matter of Statistics, structured in two subjects: Statistics for Economics and Statistical Inference. The fundamental mission of the subject Inference Statistics is to deduce properties (make inferences) from a population, from a small part of it (sample). The goodness of these deductions is measured in probabilistic terms, that is, all inference is accompanied by its probability of success. Inferential statistics include: sample theory, estimation of parameters, hypothesis testing, experimental design and Bayesian Inference.

### 4. Competencies of the degree that the course contributes to achieve

#### Competences obtained with the subject

E03	Ability to search for economic information and selection of relevant facts.
E06	Applied to the analysis of the problems professional criteria based on the management of technical instruments.
E16	To identify relevant sources of financial information and its content, as well as to acquire skills to derive the important information from the data, otherwise completely unknown to non-professionals.
G01	Own skills for continued, self-directed learning and autonomous, allowing them to develop learning skills needed to undertake studies with a high degree of autonomy.
G03	Develop oral and written communication to develop reports, research projects and business projects, and be able to defend them before any Commission or collective (specialized or not) in more than one language, collecting relevant evidence and interpreting them adequately to reach conclusions.
G04	Ability to use technology of information and communications in the development of the professional activity.

G05	Ability to work as a team, lead, direct, plan and supervise multidisciplinary and multicultural teams, both in a domestic and an international environment.
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## 5. Objectives or expected learning results

### Results from taking the subject

To know the tools and methods for quantitative analysis of markets, sectors and companies, including models for decision-making and economic forecasting models.

Enable students to know the sources of official statistics and their treatment for the analysis of economic reality

Train student to solve problems in a creative and innovative way.

Enable student for autonomous work and learning, as well as for personal initiative.

Train students to search for information, analysis, interpretation, synthesis and transmission.

### Additional results

The student will be able to: a) Access the relevant statistical-economic information. B) Understand and apply the approximation of random variables, as a powerful tool to solve problems formed by the accumulation of infinity of small phenomena random. C) Extract a sample from a population with a level of randomness and representativeness sufficient to ensure the validity of the conclusions drawn. D) Identify the distribution of the phenomenon under study in a population and estimate their parameters (or characteristics) by the best possible procedures. E) Know how to identify a problem with the appropriate hypotheses and handle the corresponding techniques to test them. F) Recognize a problem, analyze it and solve it using the method scientific. G) Use basic software for statistical analysis (Excel and R) h) Solve problems in a creative and innovative way. I) Work and learn autonomously and with personal initiative. J) Collaborate with other students to achieve group work. K) Listen and defend oral and written arguments.

## 6. Syllabus

### Theme 1 DISTRIBUTIONS DERIVED FROM THE NORMAL AND THE CENTRAL LIMIT THEOREM

Theme 1.1 CONVERGENCE OF SUCCESSIONS OF RANDOM VARIABLES: THEORY OF THE CENTRAL LIMIT

Theme 1.2 DISTRIBUTIONS FROM NORMAL

### Theme 2 DISTRIBUTIONS IN SAMPLING

Theme 2.1 SAMPLING: STATISTICS AND THEIR DISTRIBUTIONS

Theme 2.2 SAMPLING IN NORMAL POPULATIONS

### Theme 3 ESTIMATORS AND THEIR PROPERTIES

Theme 3.1 POINT ESTIMATION: CONCEPT AND PROPERTIES OF ESTIMATORS

Theme 3.2 METHODS OF POINT ESTIMATION

Theme 3.3 CONFIDENCE INTERVALS ESTIMATION

### Theme 4 HYPOTHESES TESTING

Theme 4.1 INTRODUCTION TO HYPOTHESES TESTING

Theme 4.2 PARAMETRIC HYPOTHESES TESTING

Theme 4.3 NON-PARAMETRIC HYPOTHESES TESTING

### Theme 5 ANALYSIS OF THE VARIANCE (ANOVA)

Theme 5.1 INTRODUCTION TO ANOVA

Theme 5.2 ANALYSIS OF THE ONE-WAY ANOVA

## 7. Activities and methodology

Training activity	Methodology	Competencies	ECTS	Hours	Ev	Man	Rec	Description	
Classroom teaching (theory)	Expository method / Master class	E03, E06, E16, G01, G04	1.33	33.25	No	-	-	The teacher will focus on the matter and the fundamental concepts. Time will also be dedicated for examples.	
Classroom teaching (practices)	Combination of methods	E03, E06, E16, G01, G03, G04, G05	0.67	16.75	Yes	No	No	Participation is valued	
Study, preparation of tests [Autonomous]	Autonomous work	E03, E06, E16, G01, G04	2.08	52.00	Yes	No	No	Independent work of student tutored by the teacher.	
Preparation of reports [Autonomous]	Group workshops	E03, E06, E16, G01, G03, G04, G05	0.72	18.00	Yes	No	Yes	At the beginning of the course working groups will be created and they handle a project that will develop along the course. These projects will be supervised by the teacher and may need to be exposed at the end of the course	
Other non-presential activities [AUTONOMOUS]	Self-learning	E16, G01, G03, G04	0.80	20.00	Yes	No	No	Individual practice. The teacher will provide the student some tasks which will have to be solved and delivered at the end of each theme.	
Progress tests [Classroom]	Evaluation tests	E03, E06, E16, G01, G03, G04	0.04	1.00	Yes	No	No	Self evaluation tests	
Final exam (Classroom)	Evaluation tests	E03, E06, E16, G01, G03, G04	0.08	2.00	Yes	Yes	Yes	Test preparation and conduct written questionnaire and exercises to solve	
Other presential activities (Classroom)	Combination of methods		0.28	7.00	No	-	-	Seminars or group tutorials	
<b>Total:</b>			<b>6.00</b>	<b>150.00</b>					
Total credits of classroom work			2.40	Total hours of classroom work:					60.00
Total credits of autonomous work:			3.60	Total hours of autonomous work:					90.00

Ev: Evaluable training activity  
 Man: Mandatory training activity  
 Rec: Recoverable training activity

## 8. Evaluation criteria the quantity and quality of participation in the Forum online, discussing business topics related to the content of the course

Evaluation system	%	Description
Assessment of participation in class	5.00%	The active attitude of the student will be assessed in the classroom.
Group Work	20.00%	At the beginning of the course working groups will be created and they will develop a project along the course. These projects will be supervised by the teacher and may need to be exposed at the end.
Progress tests	10.00%	Written choice test with 10 questions. Each question has three alternative answers, one correct and two incorrect. Each correct answer adds 1 point and each failed subtract 0.5, questions left blank unscored.
Final exam	65.00%	Written test with some practical questions to be solved
<b>Total:</b>		<b>100.00%</b>

### Particularities of the extraordinary call:

You can only recover the qualifications of group work and problem solving (handing it over again according to teacher recommendations) and final test (exam). Qualifications of the other sections will be retained but without possibility of recovery.

## 9. Sequence of work, schedule, milestones and temporary investment

The professors do not consider necessary to plan hour-to-hour each of the themes since the time devoted to a theme will depend on its difficulty and the ability of the student to understand and take advantage of the themes.

## 10. References

Author/s	Title	Editorial	ISBN	Year
Canavos, George C.	Probabilidad y estadística: aplicaciones y métodos	McGraw-Hill	84-481-0038-7	2003
Canavos, G.C. & Miller D.M.	Modern Business Statistics	Duxbury Resource Center	978-0534168360	1994
Casas Sánchez, José M.	Estadística. II, Inferencia estadística	Centro de Estudios Ramón Areces, S.A.	978-84-9961-024-5	2011
Casas Sánchez, José M.	Inferencia estadística : (incluye ejercicios resueltos)	Centro de Estudios Ramón Areces	978-8480042635	2009
Hand, Diamond J.	Statistics: A very short introduction	Oxford U.P.	978-0199233564	2008
Martín-Pliego López, Fco. Javier	Problemas de inferencia estadística	Thompson	84-9732-355-6	2005
Pérez, R.	Análisis de datos económicos	Pirámide	84-368-0728-6(o.c.)	1997

Rohatgi, Vijay K.	An introduction to probability theory and Mathematical Statistic	John Wiley	0-471-73135-8	1976
Rohatgi, Vijay K.	Statistical inference	Dover	0-486-42812-5 (pbk.)	2003
Ruiz-Maya, Luis	Fundamentos de inferencia estadística	AC Thomson Paraninfo	84-9732-354-8	2004
Wasserman, Larry A.	All of Statistics: A concise course in Statistical Inference		978-0387402727	2004
Webster, Allen L.	Estadística aplicada a los negocios y la economía	McGraw-Hill	958-410-072-6	2000