Statistics II   **2014/2015**

Code: 102385
ECTS Credits: 6

Degree	Type	Year	Semester
2501572 Administració i Direcció d'Empreses	FB	2	1
2501573 Economia	FB	2	1

Contact

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Use of languages

Principal working language: català (cat)

Some groups entirely in English: Yes

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: No

Teachers

Xavier Vilà Carnicero

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Mireia Díaz Sanchís

Maria del Mar Gómez Pujalte

Prerequisites

It is recommended that the student has passed the following subjects: Statistics I, Mathematics I and Mathematics II. This way, the student will have acquired the competences necessary to Statistics II with the best warranty of success.

Objectives and Contextualisation

This subject will enable the students to understand and apply the statistical method to solve problems characteristic of economics and business. Thus, starting from empirical evidence gathered in a given sample the students will be able to arrive to conclusions scientifically valid which will help them in decision making.

This subject must also provide students with the theoretical foundations that will enable them to follow satisfactorily other subjects (Econometrics, Econometric forecast models, Operations Research) of quantitative content as well as tools that will help them with a better understanding of subjects such as Macroeconomics, Game Theory, Marketing Research) in which some statistical concepts (theoretical or practical) can play an important role.

Skills

Administració i Direcció d'Empreses
- Analyse quantitative and qualitative information referring to economic phenomena and variables.
- Apply the basic statistics for improving processes of analysis and systematisation of business information and learn rigorously and scientifically about the company chain of value.
- Capacity for adapting to changing environments.

- Capacity for oral and written communication in Catalan, Spanish and English, which enables synthesis and oral and written presentation of the work carried out.
- Organise the work in terms of good time management, organisation and planning.
- Select and generate the information necessary for each problem, analyse it and take decisions based on that information.
- Take decisions in situations of uncertainty, demonstrating an entrepreneurial and innovative attitude.

    Economia
- Analyse quantitative and qualitative information referring to economic phenomena and variables.
- Apply the basic statistics for improving processes of analysis and systematisation of business information and learn rigorously and scientifically about the company chain of value.
- Capacity for independent learning in the future, gaining more profound knowledge of previous areas or learning new topics.
- Demonstrate initiative and work individually when the situation requires it.
- Organise the work in terms of good time management, organisation and planning.
- Select and generate the information necessary for each problem, analyse it and take decisions based on that information.
- Take decisions in situations of uncertainty, demonstrating an entrepreneurial and innovative attitude.
- Use of the available information technology and adaptation to new technological environments.
- Work well in a team, being able to argue proposals and validate or reject the arguments of others in a reasoned manner.

Learning outcomes

1. A capacity of oral and written communication in Catalan, Spanish and English, which allows them to summarise and present the work conducted both orally and in writing.
2. Analyse and establish both quantitative and qualitative conclusions about the performance of variables with random elements.
3. Analyse variables using the hypothesis contrast on its main characteristics.
4. Capacity to adapt to changing environments.
5. Capacity to continue future learning independently, acquiring further knowledge and exploring new areas of knowledge.
6. Demonstrate initiative and work independently when required.
7. Formalise the causal relationship between economic variables and uncertainty.
8. Make decisions in situations of uncertainty and show an enterprising and innovative spirit.
9. Organise work, in terms of good time management and organisation and planning.
10. Select and generate the information needed for each problem, analyse it and make decisions based on this information.
11. Use available information technology and be able to adapt to new technological settings.
12. Work as part of a team and be able to argue own proposals and validate or refuse the arguments of others in a reasonable manner.

Content

Unit 1 Introduction to Inferential Statistics

1.1 Inferential Statistics: Definition and Inference Methods

1.2 Definition and properties of Simple Random Sampling

1.3 Distribution of the main sample statistics: mean, variance and proportion

1.4 Central Limit Theorem

Unit 2 Estimation

2.1 Objective of statistical estimation

2.2 Definition and characteristics of estimators

2.3 Properties of estimators: bias, efficiency and consistency

2.4 Methods of point estimation: maximum likelihood and method of moments

2.5 Methods of interval estimation

Unit 3 Parametric hypothesis tests

3.1 Concept of parametric test: null hypothesis and alternative hypothesis

3.2 Test statistic and error type

3.3 Tests on the population mean, population variance and population proportion

3.4 Test of differences

3.5 Analysis of Variance

Unit 4 Goodness-of-fit and analysis of the relationship between variables

4.1 Test of goodness-of- fit

4.2 Types of relationships between variables

4.3 Test of independence between qualitative variables

4.4 Analysis of the correlation between quantitative variables: correlation coefficient and hypothesis test

Unit 5 Introduction to the regression model

5.1 Objectives of the model

5.2 Hypothesis of the model specification

5.3 Estimation by Ordinary Least Squares (OLS) and their properties

5.4 Model testing

5.5 Coefficient of the goodness-of- fit and relationship between the correlation and the regression analysis

5.6 Forecast

Methodology

The activities that will allow the students to learn the basic concepts included in this course are:

1. Theory lectures where the instructor will explain the main concepts.

The goal of this activity is to introduce the basic notions and guide the student learning

2. Problem Sets

A problem set which students will have to solve individually will be included in every unit. The goal of this activity is twofold. On one hand students will work with the theoretical concepts explained in the classroom, and on the other hand through this practice they will develop the necessary skills for problem solving.

3. Practice lectures

The aim of this activity is to comment on and solve any possible doubt that students may have had solving the problem assignment. This way they will be able to understand and correct any errors they may have had during this process.

4. Tutoring hours

Students will have some tutor hours in which the subject instructors will help them solve any doubts they may have. The level of use of ICT will be subject to availability and the number of students registered in the groups.

Activities

Title	Hours	ECTS	Learning outcomes
Type: Directed			
Lectures	30	1.2	2, 3, 7, 8, 10, 11
Resolution of exercises	15	0.6	2, 3, 4, 1, 5, 7, 6, 9, 8, 10, 12, 11
Type: Supervised			
Tutoring and monitoring work in progress	7.5	0.3	2, 3, 4, 1, 5, 7, 6, 9, 8, 10, 12, 11
Type: Autonomous			
Individual study	90	3.6	2, 3, 4, 1, 5, 7, 6, 9, 8, 10, 12, 11

Evaluation

Students assessment will be conducted in accordance with the following activities:

1. One written midterm exam

During this written exam, students will not be allowed to consult any kind of help. The maximum time allowed for this exam will be 60 minutes. This exam do not exclude contents from the final exam.

2. A final exam that will include all the course contents

This exam's goal is to assure the students final learning effort to consolidate the contents acquired throughout the course. This double assessment system guarantees the success of the learning process of the majority of students. The maximum time allowed for this exams will be 3 hours. Students will not be allowed to consult any kind of help.

3. Submission of problem sets and papers

Students will occasionally submit (upon the instructor's request) exercises and/or papers done in groups of 2-4 students.

Assessment computation

(a) Students will get for the midterm exam a grade which will represent a 25% of the final course grade.

(b) The final exam, which is compulsory, will represent a 60% of the final course grade.

(c) The exercise list submission and the paper will get a global grade which represents a 15% of the final course grade.

FINAL GRADE = 25% (MIDTERM EXAM) + 15%(TASKS SUBMISSIONS) + 60% (FINAL EXAM)

(d) The subject will be considered passed if the final grade is 5 or higher.

(e) A student will be considered "No show" if he/she has not participated in any of the assessment activities. Therefore, a student who does part of the continuous assessment will not be eligible for a "No show".

(f) All the students must take the exams and do the assigned tasks on the dates announced in the subject calendar. There won't be extra exams on dates other than the official dates announced in the subject calendar.

Assessment Calendar.

The date of the midterm will be announced with anticipation during the semester. The date for the final exam will be included in the School exam calendar.

Grade publication and revision.

By the time of the final exam the day and means of publication of final grades will be announced. Following the University regulations , the procedure, place, date and time of the exam revision will also be announced. .

Post-Assessment.

For those students who have obtained in the assessment a degree equal or higher than 4 and lower than 5, there will be a post-assessment whose form will be announced when the final degrees are published.

This post-assessment will be programmed in the School exam calendar. Students who take the exam and obtain a pass degree, will pass the subject with a degree of 5. Otherwise, the first grade will remain valid.

Honor Code

Notwithstanding other relevant discipline actions, always in accordance with the regulations in place, any dishonest behavior on the side of a student that might lead to an inappropriate alteration of the qualification of an activity will result on that activity being graded with a zero mark.

Thus, copying (or allowing others to copy your work) on any assignment, test, or other evaluation activity will result on that activity receiving a mark of zero.

If such actvity is necessary for passing the course, the student will fail the course. Furthermore, the student will not be allowed to re-take any of the activities where such dishonest behavior is detected. The student will therefore fail the course for the current academic year.

Evaluation activities

Title	Weighting	Hours	ECTS	Learning outcomes
Exercises and essays	15%	2.5	0.1	2, 3, 4, 1, 5, 7, 6, 9, 8, 10, 12, 11
Final exam	60%	3	0.12	2, 3, 4, 1, 5, 7, 6, 9, 8, 10
Midterm exam	25%	2	0.08	2, 3, 4, 1, 5, 7, 6, 9, 8, 10

Bibliography

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Canavos, GC Probabilidad y Estadística. - Canavos, GC Applied probability and statistical methods. McGraw-Hill. McGraw-Hill. 1998 1998

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