UAB
Universitat Autònoma de Barcelona

Statistics I	**2016/2017**

Code: 102115
ECTS Credits: 6

Degree	Type	Year	Semester
2501231 Accounting and Finance	FB	1	2
2501232 Business and Information Technology	FB	1	2

Contact

Name: Maria Dolores Márquez Cebrián

Email: MariaDolores.Marquez@uab.cat

Use of languages

Principal working language: catalan (cat)

Some groups entirely in English: Yes

Some groups entirely in Catalan: Yes

Some groups entirely in Spanish: Yes

Teachers

Anabel Blasco Moreno

Ana Vazquez Fariñas

Nestor Garcia Alvarez

David Moriña Soler

Prerequisites

It is recommended that the student has passed the course of Mathematics I and is taking (or have passed) Mathematics II.

Thus the student has achieved all the skills needed to approach the study of Statistics I with the best guarantees of success.

Objectives and Contextualisation

The aim of this course is that students understand and are able to use the basic probabilistic tools that are necessary to address the study of statistical inference. In this sense, the subject is clearly linked, in terms of its immediate application, to the course Statistics II.

However, the skills in probabilistic tools that the student will acquire in this course are also useful in other subjects, such as microeconomics, macroeconomics, econometrics and, in general, those in which random phenomena play an important role.

Skills

Accounting and Finance
- Analysing, summarising and assessing information.
- Communicating in oral and written form in Catalan, Spanish and English, in order to be able to summarise and present the carried out project in both forms.

- Interpreting and using mathematical tools and statistics in order to identify and solve problems of the economical and business scope with deterministic or/and random components.
- Searching for innovative and imaginative solutions.

Business and Information Technology
- Appropriately drawing up technical reports according to the customer's demands.
- Interpreting and using mathematical and statistic tools in order to identify and solve problems of the economical and business scope with deterministic or/and random components.
- Students must be capable of analysing, summarising, organising, planning and solving problems and making decisions.
- Students must be capable of searching and analysing information of different sources.

Learning outcomes

1. Analysing, summarising and assessing information.
2. Appropriately drawing up technical reports according to the customer's demands.
3. Communicating in oral and written form in Catalan, Spanish and English, in order to be able to summarise and present the carried out project in both forms.
4. Identifying situations characterised by the presence of randomness and analysing them through the basic probabilistic tools.
5. Representing and analysing quantitative and qualitative information referring to economic phenomena and variables.
6. Starting out in the formal study of the analysis of the relationship between variables.
7. Students must be capable of analysing, summarising, organising, planning and solving problems and making decisions.
8. Students must be capable of searching and analysing information of different sources.
9. Students must demonstrate they have an innovative and entrepreneur spirit.

Content

Unit 1 Descriptive Statistics

1.1. Univariate frequency distribution tables.

1.2. Measures of central tendency, measures of dispersion and other characteristic measures.

1.3. Histograms and other graphic representations.

1.4. Multivariate frequency distributions. Conditional and marginal frequencies.

1.5. Covariance and correlation coefficient.

1.6. Mean and variance of linear combinations of variables.

1.7. Mean vector and covariance matrix.

Unit 2 Probability theory

2.1. Random events and sample spaces.

2.2. Probability: Axiomatic definition and interpretations.

2.3. Combinatory.

2.4. Probability computation and its properties.

2.5. Conditional probability and stochastic independence.

2.6. Total probability and Bayes Theorems

Unit 3 Discreterandom variables

3.1. Definition of random variable.

3.2. Probability function and distribution function.

3.3. Numeric characteristics: Expectation and Variance.

3.4. Multidimensional random variables.

3.5. Joint and marginal probability functions.

3.6. Conditional probability function and conditional expectation. The concept of independence.

3.7. Covariance and correlation coefficient. Covariance matrix.

3.8. Classical discrete distributions: Bernoulli, Binomial, Poisson.

Unit 4 Continuous random variables

4.1. Density function and distribution function.

4.2. Numeric characteristics: Expectation and variance.

4.3. Joint and marginal density functions.

4.4. Conditional density function and conditional expectation.

4.5. Classical continuous distributions: Uniform, Exponential, Normal, Uniform and Normal multivariate analysis.

4.6. Normal approximation to the Binomial distribution.

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 teach 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			
Lab sessions	7.5	0.3	4, 6, 5
Lectures	30	1.2	4, 6, 5
Resolution of exercises	15	0.6	4, 6, 5
Type: Supervised			
Tutoring and monitoring work in progress	15	0.6	4, 6, 5
Type: Autonomous			
Individual study	75	3	4, 6, 5

Evaluation

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

1. A written midterm exam

During the written exam, students will not be allowed to consult any kind of help. The maximum time allowed will be 50 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 2 hours. Students will not be allowed to consult any kind of help.

3. Submission of problem sets and papers

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

Assessment computation

(a) Students will get for each of the two midterms 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/or paper will get a global grade which represents a 15% of the final course grade.

(d) If the final exam grade is 3 or higher, the FINAL COURSE GRADE is

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

However, if the final exam grade is lower than 3, the FINAL COURSE GRADE is

FINAL COURSE GRADE =FINAL EXAM GRADE

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

(f) A student will be considered "Not evaluable" if he/she has not participated in any of the assessment activities.

(g) 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 dates of the two midterms 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 activity is necessary for passing thecourse, 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%	3.5	0.14	1, 9, 4, 6, 2, 5, 7, 8, 3
Final exam	60%	3	0.12	4, 6, 5
Midterm exam	25%	1	0.04	4, 6, 5

Bibliography

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

- **Lind, DA et al.** Statistical Techniques in Business and Economics. McGraw-Hill. McGraw-Hill. 2008

- **Newbold P.** Statistics for business and economics. Pearson-Prentice Hall. Pearson-Prentice Hall. 2005

Links:

http://www.seeingstatistics.com