

**Statistics**

Code: 101856  
ECTS Credits: 6

Degree	Type	Year	Semester
2502501 Prevention and Integral Safety and Security	FB	1	1

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

**Prerequisites**

This subject does not have any pre-requirement

**Objectives and Contextualisation**

To learn the theoretical basis for the compression of the information elaborated by the competent organisms in the field of security, as well as statistical observatories.

To understand how to elaborate and adjust statistical information to specific environments, both for public and/or private activities, where professionals will develop their function in the future.

To achieve the ability to infer and make forecasts, and to know the relevant variables and their management in scenarios of risk, uncertainty and competition.

Using tools and basic computer programs that contribute to the previous ones.

**Competences**

- Apply specific software tools to solve problems specific to security.
- Be able to communicate efficiently in English, both orally and in writing.
- Carry out scientific thinking and critical reasoning in matters of preventions and security.
- Contribute to decisions on investment in prevention and security.
- Know how to communicate and transmit ideas and result efficiently in a professional and non-expert environment, both orally and in writing.
- Plan and coordinate the resources of the three large subsystems that interact in questions of security: people, technology and infrastructures.
- Use the capacity for analysis and synthesis to solve problems.
- Work and learn autonomously.
- Work in institutional and interprofessional networks.

**Learning Outcomes**

1. Apply the basis of statistics. Economics and finance, in the applicable legal framework and the informatics necessary to undertake prevention and security.
2. Apply tools and develop specific software for solving the problems that are particular to security, the environment, quality and social corporate responsibility.
3. Be able to communicate efficiently in English, both orally and in writing.
4. Carry out scientific thinking and critical reasoning in matters of preventions and security.
5. Design a project applied to integral security and prevention in an organisation.
6. Know how to communicate and transmit ideas and result efficiently in a professional and non-expert environment, both orally and in writing.
7. Use the capacity for analysis and synthesis to solve problems.
8. Work and learn autonomously.
9. Work in institutional and interprofessional networks.

## **Content**

### 1. Introduction

- 1.1. Concept of statistics
- 1.2. Statistical sources
- 1.3. Statistical data applied to risks' prevention
- 1.4. Statistics in the decision making

### 2. Statistical observation

- 2.1. Universe and sample
- 2.2. Variables and attributes
- 2.3. Data and its treatment
- 2.4. Counting methods

### 3. Analysis of one variable

- 3.1. Measures of position
  - 3.1.1. Mode, median, quantiles and averages
- 3.2. Measures of dispersion
  - 3.2.1 Range, expected value, variance and standard deviation
- 3.3. Measures of distribution
  - 3.3.1. Skewness
- 3.4. Grouping and distribution of frequencies
  - 3.4.1. Graphic analysis

### 4. Analysis of two variables

- 4.1. Correlation and regression. Concepts

### 5. Time series. Introduction

- 5.1. Trend and variation types

## 5.2. Moving average

## 6. Combinatorics

### 6.1. Probability. Introduction

#### 6.2.1. Classical or a priori, a posteriori, subjective, axiomatic and conditional

### 6.2. Basic theorems

### 6.3. Probability and risk

### 6.4. Density and frequency functions

## Methodology

The theoretical sessions in the classroom will be completed with practical sessions, which will take up most of the time, and the development and resolution of individual, and / or group work exercises. The practical sessions, divided into two groups, will consist of the development of exercises and group work, in which some of the concepts presented in the theoretical sessions will be applied to practice. Subsequently a summarizing statement will be provided within the class.

The autonomous activities will correspond to both the personal study and the resolution of the exercises and works proposed by the faculty. It will be worth researching documents of topics related to the subject matter of study and personal consolidation work of which has been exposed in class (programmed readings, individual exercises). In addition, you will have to follow up and study different exercises and practical cases.

The proposed activities will evaluate the knowledge and competences acquired by the students, in accordance with the criteria presented in the following section.

Tutorials with the teaching staff will be arranged by email.

It is recommended to bring the individual computer class (a regular use of spreadsheets will be used to complement the theory)

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Theoretical and practical classes with the participation of students	44	1.76	2, 1, 3, 6, 4, 5, 9, 8, 7
Type: Supervised			
Tutorials with the students	12	0.48	2, 1, 3, 6, 4, 5, 9, 8, 7
Type: Autonomous			
Resolution of practical cases. Realization of works. Personal study	94	3.76	2, 1, 3, 6, 4, 5, 9, 8, 7

## Assessment

### 1- Periodic exercises

Throughout the course, tasks and exercises will be requested in Excel. For the final assessment of the subject, at least 2/3 of the same must be submitted in time. Not only the correct resolution will be assessed, but the

presentation of the proposal to analyze and conclusions drawn. The grade of each task will be between 0 and 10. The exercises not delivered will be scored 0 (zero). The average (arithmetic or weighted) of these duties will have a weight in the final grade of 30%.

Most exercises will be corrected in-class briefly. Each student or group can correct them and forward them, if this would be allowed. These second hand-in will not be graded but will serve to compensate for further insufficient results.

## 2- Course work

You will have to do a long-term assignment that has to be handed-in on a specific date. At the beginning of the course, it will be indicated if the work is individual or team-based. Important, the grading will be from 0 to 7 (explained more in section 4). It will have a specific weight to the final grade of 30%.

The course work is required for the evaluation of the subject and at least 4 out of 10 must be attained to be considered. If this minimum of 4 in this section is not achieved, having submitted an assessable work on the expected dates, a forward period of 15 days will be proposed for the delivery of the corrections proposed by the teacher. In this case the maximum valuation of the work will be 5-Pass.

## 3- Individual theoretical-practical tests

Two or three individual tests will be carried out in the course. They will consist of problems and statistical exercises and theory of the syllabus. The tests, rated from 0 to 10, will be averaged (arithmetic or weighted) and weigh 40% overall in the final mark.

If you do not pass the subject in accordance with the aforementioned criteria (continuous assessment), a recovery test can be done on the arranged date and time, and that will contain the whole content in the program. To participate in the re-take test, there must be proof for evaluation in a set of activities, the weight of which is equivalent to a minimum of 2/3 of the total grade of the subject. However, the qualification that will appear in the student's file is of a maximum of 5-Pass.

If it is necessary to change the date of any of the tests, the petition must be submitted by filling out the document that you will find in the moodle EPSI tutorial space.

["If the student makes any irregularities that may lead to a significant variation in the qualification of an evaluation act, this evaluation act will be classified with a 0, regardless of the disciplinary process that can be instructed. produce different irregularities in the acts of evaluation of the same subject, the final grade of this subject will be 0 ".]

## 4- Continuous evaluation - multiplier

Tracking will be evaluated throughout the course. It is intended to see the evolution during the course, as well as the domain at the end of it. For example, attendance and participation in class will be valued (not mere participation but also quality of contribution) or the active proposition / resolution of questions in forums provided in the virtual space, among others.

In short, the three sections above allow a maximum score of 9.1. Then, a multiplier will be applied between 1.00 and 1.10, on teacher's discretion (eg note 9.1 \* maximum multiplier 1,1 = 10, or note 7.2 \* remarkable multiplier 1,07 = 7.7 ). Not delivering tasks or assignment or cases in which plagiarism is detected may imply a multiplier lower than 1.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Delivery of exercises and work done by students	30%	0	0	2, 1, 3, 6, 4, 5, 9, 8, 7

Report on the practices carried out. Final project	30%	0	0	2, 1, 3, 6, 4, 5, 9, 8, 7
Written or oral tests to assess the knowledge acquired by the student	40%	0	0	2, 1, 3, 6, 4, 5, 9, 8, 7

## Bibliography

Paul g. Hoel. Introducción a la Estadística Matemática

Paul g. Hoel, Raymond J. Jessen.- Estadística Básica para Negocios y Economía

Angel Alcaide, Nelson Alvarez .- Econometría, Modelos Deterministas y Estocásticos.

Sánchez Fdez. J.- Introducción a la Estadística Empresarial

Jorge Galbiati. .- Estadística Asistida por Ordenador

Vladimir Zaiats, M.Luz Calle i Rosa Presas.- Probabilitat i Estadística. Exercicis I

Alfonso Garcia Barbancho y Vicente Lozano .- Estadística Teórica

R.S & D.L. Rubinfeld .- Econometric Models and Economic Forecasts.