

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: spanish (spa)
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

Learn the basic statistical theoretical basis for the analysis and comprehension of information prepared by the competent bodies in the field of security and by statistical observatories.

Master the formulation necessary to prepare and adjust for themselves the statistical information to their own specific environments, both public or private activity, where they develop their function in the future.

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

Use basic tools and computer programs, complementary to the content of the subject.

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.
- Make changes to methods and processes in the area of knowledge in order to provide innovative responses to society's needs and demands.
- Plan and coordinate the resources of the three large subsystems that interact in questions of security: people, technology and infrastructures.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.

- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
- Take account of social, economic and environmental impacts when operating within one's own area of knowledge.
- Use the capacity for analysis and synthesis to solve problems.
- Work and learn autonomously.
- Work in institutional and interprofessional networks.

Learning Outcomes

1. Analyse indicators of sustainability for academic and professional activities in the area including social, economic and environmental considerations.
2. Apply the basis of statistics, economics and finance, in the applicable legal framework and the informatics necessary to undertake prevention and security.
3. Apply tools and develop specific software for solving the problems that are particular to security, the environment, quality and social corporate responsibility.
4. Be able to communicate efficiently in English, both orally and in writing.
5. Carry out scientific thinking and critical reasoning in matters of preventions and security.
6. Design a project applied to integral security and prevention in an organisation.
7. Identify the social, economic and environmental implications of the academic and professional activities in the field of self-knowledge.
8. Know how to communicate and transmit ideas and result efficiently in a professional and non-expert environment, both orally and in writing.
9. Propose new ways to measure success or failure when implementing ground-breaking proposals or ideas.
10. Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
11. Students must be capable of collecting and interpreting relevant data (usually within their area of study) in order to make statements that reflect social, scientific or ethical relevant issues.
12. Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
13. Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
14. Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.
15. Use the capacity for analysis and synthesis to solve problems.
16. Weigh up the risks and benefits of both your own proposals for improvement and those of others.
17. Work and learn autonomously.
18. 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
- 2.5. Frequency tables
- 3. Analysis of one variable
 - 3.1. Position measures
 - 3.1.1. Mode, median, quantiles and averages
 - 3.2. Dispersion measures
 - 3.2.1 Range, expected value, variance and standard deviation
 - 3.3. Distribution measures
 - 3.3.1. Skewness and kurtosis
 - 3.3.2. The histogram
 - 3.4. Grouping and distribution of frequencies
 - 3.4.1. Graphic analysis
- 4. Analysis of two variables
 - 4.2. Contingency tables
 - 4.1. Correlation and linear regression
- 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
 - 6.5. Probability and forecasts
 - 6.6. Probability adjusted to risk environments

Methodology

In-class sessions will be mostly master classes where the concepts of the subject will be introduced. It will be in tandem with practical lessons, split into smaller groups, which will develop exercises and practical examples.

These exercises will be done individually or in groups, at the convenience of the content, and will be based on the theoretical concepts learned. Subsequently, a pooling will be carried out from which the corresponding academic conclusions will be obtained.

Autonomous activities will correspond both to the personal study and to the resolution of the exercises and works proposed by the teacher. It will be valued to investigate documentation of subjects related to the subject object of study and personal works of consolidation on which it has exposed in class (programmed readings, individual exercises). In addition, you will need to follow up and study different exercises and case studies proposed.

The activities proposed during the course will evaluate the knowledge and skills acquired by the students, in accordance with the criteria presented in the next section.

Tutorials with teachers will be arranged by email, upon request.

Sometimes, especially in the practical lessons, students will be encouraged to attend with an individual computer (spreadsheets will be regularly used for the development of exercises)

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Theoretical and practical classes with the participation of students	44	1.76	1, 3, 2, 4, 8, 5, 6, 7, 16, 9, 14, 13, 12, 10, 11, 18, 17, 15
Type: Supervised			
Tutorials with the students	12	0.48	1, 3, 2, 4, 8, 5, 6, 7, 16, 9, 14, 13, 12, 10, 11, 18, 17, 15
Type: Autonomous			
Resolution of practical cases. Realization of works. Personal study	94	3.76	1, 3, 2, 4, 8, 5, 6, 7, 16, 9, 14, 13, 12, 10, 11, 18, 17, 15

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 25%.

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. It will have a specific weight to the final grade of 25%.

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 50% overall in the final mark. Each individual test will require a grade equal or higher than 3.5 (out of 10) to be considered. If this criterion is not met, the student will do the re-take test.

If you do not pass the subject based on the aforementioned criteria (continuous assessment), a re-take 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 transcripts will be as maximum 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 “.]

"In accordance with article 117.2 of the UAB Academic Regulations, the assessment of repeating students may consist of a single synthesis test. Repeating students pursuing this option must contact with the teachers at the beginning of the course "

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Delivery of exercises and work done by students	25%	0	0	1, 3, 2, 4, 8, 5, 6, 7, 16, 9, 14, 13, 12, 10, 11, 18, 17, 15
Report on the practices carried out. Final project	25%	0	0	1, 3, 2, 4, 8, 5, 6, 7, 16, 9, 14, 13, 12, 10, 11, 18, 17, 15
Written or oral tests to assess the knowledge acquired by the student	50%	0	0	1, 3, 2, 4, 8, 5, 6, 7, 16, 9, 14, 13, 12, 10, 11, 18, 17, 15

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.

Software

Microsoft Excel