Information about the subject

Degree: Bachelor of Science Degree in Business Administration and Management

Faculty: Faculty of Legal, Economic and Social Sciences

Code: 301202 **Name:** Descriptive Statistics

Credits: 6,00 **ECTS Year:** 2 **Semester:** 1

Module: Quantitative Methods

Subject Matter: Statistics **Type:** Basic Formation

Field of knowledge: Ingeniería y Arquitectura

Department: Economics, Business Management, and Marketing

Type of learning: Classroom-based learning / Online

Languages in which it is taught: English, Spanish

Lecturer/-s:

302A	Alberto Sanz Cazorla **(Responsible Lecturer)**	alberto.sanz@ucv.es
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Module organization

Quantitative Methods

Subject Matter	ECTS	Subject	ECTS	Year/semester
Information Systems	12,00	Information Systems for Management I	6,00	1/2
		Information Systems for Management II	6,00	2/1
Mathematics	6,00	Mathematics for Economics and the Business	6,00	1/1
Statistical and Econometric Methods	12,00	Econometrics	6,00	4/1
		Statistical Inference	6,00	3/2
Statistics	6,00	Descriptive Statistics	6,00	2/1

Recommended knowledge

This course does not assume any prior knowledge of statistics or probability. However, it is expected that students possess a working knowledge of spreadsheet software —primarily acquired through the *Information Systems for Management* course taken in earlier stages of the program— as well as proficiency in managing files on personal computers.

Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

R1	Understand the tools of descriptive statistics (tables, graphs and statistics) and know where to apply in every case.
R2	Can understand and develop a descriptive study of a random variable.
R3	Can understand, quantify and express the linear relationship between two numerical variables.
R4	Understand the basic principles of probability theory and can apply them to solve simple problems.
R5	Understands and applies basic concepts of random variable and probability distribution. Knows the main discrete distributions (Binomial, Poisson and geometric) and continuous (Uniform, Exponential and Normal).

Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB1	That students have demonstrated knowledge and understanding in an area of study that is at the core of general secondary education, and is often at a level that, while supported by advanced textbooks, also includes some aspects that involve knowledge from the cutting edge of their field of study.			x	
CB2	That students know how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.				x
CB3	That students have the ability to gather and interpret relevant data (usually within their area of study) to make judgments that include reflection on relevant social, scientific or ethical issues.				x
CB4	That students can convey information, ideas, problems and solutions to both specialized and non-specialized audiences.				x
CB5	That students have developed those learning skills necessary to undertake further studies with a high degree of autonomy.				x

GENERAL		Weighting			
		1	2	3	4
CG0	Speaking well in public.			x	
CG1	Capacity of analysis and synthesis.				x
CG3	Capacity to apply knowledge into practice.				x
CG5	Oral and written communication.		x		
CG6	Use of ICTs				x

CG7	Information management.				x
CG8	Orientation to problem-solving.				x
CG11	Creativity and ability to generate new ideas.		x		
CG13	Ability to learn and research skills.			x	
CG18	Ability to obtain, from the data, valuable information for decision making.		x		

SPECIFIC		Weighting			
		1	2	3	4
CE14	To understand the potential impact of aspects related to the macro- and microeconomic environment and its institutions on business organizations (e.g. the monetary and financial system, domestic markets)				x
CE15	Ability to obtain, from the data, valuable information for decision making.				x
CE17	Application of professional criteria to the analysis of business problems.			x	
CE18	Ability to integrate in any functional area of a company and develop different tasks related to its management.				x

Assessment system for the acquisition of competencies and grading system

In-class teaching

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5	15,00%	Objective Tests
R1, R2, R3, R4, R5	25,00%	Conduct of Theory-Practice
R1, R2, R3, R4, R5	10,00%	Class attendance and participation
R1, R2, R3, R4, R5	50,00%	Final Exam

Observations

1.In order to pass the course, it is a mandatory requirement to obtain **at least 5 out of 10 points in the final on-site exam** in any of the available calls: **first call, second call, early call, or single assessment**. If the student fails the final exam, the **overall weighted grade for the course cannot exceed 4.9 out of 10**.

2.In the **second call** and under the **single assessment**, objective tests, theoretical-practical activities, and attendance and participation in class will be assessed through a **practical on-site test involving data analysis using a computer**, in addition to the final on-site exam.

3.Single assessment: According to Article 9 of the General Regulations for the Evaluation and Grading of Official Degrees and Own Degrees at UCV, the single assessment is linked to the **inability of students enrolled in an on-site program to attend classes**. It is therefore considered an **extraordinary and exceptional assessment system** that may be requested by students who, for **justified and documented reasons**, are unable to follow the continuous assessment system. Requests must be submitted to the course instructor, who will make an express decision regarding the acceptance or rejection of the request and will inform the student accordingly.

The evidence to be submitted and/or the test(s) to be taken under the single assessment will consist of the **same theoretical exam as the rest of the students**, as well as a **practical on-site test involving data analysis using a computer**. The final grade will be calculated using the following weightings: **50% theoretical exam and 50% practical test**. This criterion applies to **both the first and second calls**.

1.Students who do not attend **at least 80% of the scheduled in-person sessions** will not be eligible to be assessed through continuous assessment methods. In such cases, they must complete, in addition to the final on-site exam, a **practical on-site test involving data analysis**

using a computer. The final grade in this case will be calculated as follows: **50% practical test and 50% theoretical exam (final on-site exam)**.

2.During the course, the instructor will dedicate one session to the definition and discussion of **best practices in the use of artificial intelligence (AI) tools applied to data analysis**. **Students who violate these best practices**, either in the continuous assessment tasks or in the final practical test, **will receive a grade of 0 (zero points)** in the corresponding test or project.

Online teaching

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5	5,00%	Attendance and participation in the activities of synchronous communication
R1, R2, R3, R4, R5	25,00%	Conduct of deliverables
R1, R2, R3, R4, R5	15,00%	Regular evaluations through online questionnaires.
R1, R2, R3, R4, R5	5,00%	Participation in discussion forums
R1, R2, R3, R4, R5	50,00%	Final on-site assessment.

Observations

1.In order to pass the course, it is an essential requirement to obtain **at least 5 out of 10 points in the final on-site exam**, in any of the available calls: **first call, second call, early call, or single assessment**. If the final exam is failed, the **overall weighted grade for the course may not exceed 4.9 out of 10 points**.

2.In the **second call** and **single assessment**, **participation in synchronous communication activities**, **submission of assignments**, **periodic evaluations via online quizzes**, and **participation in discussion forums** will be assessed through a **practical on-site test**, in addition to the final on-site exam.

3.Single assessment: According to Article 9 of the General Regulations for the Evaluation and Grading of Official Degrees and Own Degrees at UCV, the single assessment is linked to the **inability of students enrolled in an on-site program to attend classes**. It is, therefore, an **extraordinary and exceptional evaluation system** that may be requested by those students who, for **justified and documented reasons**, are unable to follow the continuous assessment system. The request must be submitted to the course instructor, who will decide expressly on whether to accept or reject the request and will notify the student of the decision.
The evidence to be submitted and/or the test(s) to be taken under the single assessment will consist of the **same theoretical exam as the rest of the students**, as well as a **practical on-site test consisting of data analysis using a computer**. The final grade will be calculated using the following weights: **50% theoretical exam and 50% practical test**. This criterion applies **both in**

the first and second call.

1.The evidence to be submitted and/or the test(s) to be taken under the single assessment will consist of the **same theoretical exam as the rest of the students**, as well as a **practical on-site test consisting of data analysis using a computer**. The final grade will be calculated using the following weights: **50% theoretical exam and 50% practical test**. This criterion applies **both in the first and second call**.

CLASS ATTENDANCE IN FACE-TO-FACE DEGREES

In accordance with the development guidelines of the General Regulations for the Evaluation and Qualification of Official Teachings and Own Degrees of the UCV, in face-to-face degrees, class attendance with a minimum of 80% of the sessions of each subject will be required as a requirement. to be evaluated. This means that, if a student does not attend the sessions of each subject, in a percentage greater than 20%, he/she will not be able to be evaluated, neither in the first nor in the second call, unless the person responsible for the subject, with the approval of the person responsible for degree, in view of duly justified exceptional circumstances, exempt from the minimum attendance percentage.The same criterion will be applicable for hybrid or virtual degrees in which teachers must maintain the same percentage in the requirement of “presence” in the different training activities , if any, even if these are carried out in virtual environments.

MENTION OF DISTINCTION:

The mention of “Honors” may be awarded to students who have obtained a grade equal to or greater than 9.0. Their number may not exceed five percent of the students enrolled in a group in the corresponding academic year, unless the number of students enrolled is lower.

Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

M1	Problem solving, commentaries, summaries to hand in periodically.
M3	Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
M5	Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.
M7	Supervised monographic sessions with shared participation.

M9 Application of multidisciplinary knowledge.

M11 Personalized and small group attention. Period of instruction and / or orientation conducted by a tutor with the objective of reviewing and discussing the materials and topics presented in classes, seminars, readings, conducting work, etc.

M13 Set of oral and/or written tests used in initial, formative or additive assessment of the student.

M14 Student study: Group Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.

M16 Group preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.

M17 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.

M19 Groupwork sessions in the chat under supervision of the lecturer. Analysis of economic and business case studies, both real and fictitious, in order to build knowledge through the student's interaction and activity. Critical analysis of values and social commitment.

M21 Monographic sessions though the semester, which will be aimed at current aspects and applications of the subject.

M23 Set of written or oral tests used for the initial, formative or cumulative assessment of the student.

M25 Student study: Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc., for their discussion or submission in electronic format.

M27 Individual support for the monitoring and orientation of the learning process. It will be carried out by a lecturer and will pursue the revision and discussion of the materials, topics, readings, tasks, etc.

M29 Group preparation of readings, essays, problem solving, seminars, papers, reports, etc., for their discussion or submission.

M31 Participation in discussion forums related to the subject under the supervision of the lecturer.

IN-CLASS LEARNING

IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
On-campus Class M1, M3	R1, R2, R3, R4, R5	22,50	0,90
Practical Class M5, M16, M19	R1, R2, R3, R4, R5	15,00	0,60
Seminar M7, M21, M29	R1, R2, R3, R4, R5	4,50	0,18
Group Presentation of Papers M1, M16, M19, M29, M31	R1, R2, R3, R4, R5	6,00	0,24
Office Assistance M11, M27	R1, R2, R3, R4, R5	6,00	0,24
Assessment M13, M23	R1, R2, R3, R4, R5	6,00	0,24
TOTAL		**60,00**	**2,40**

LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group Work M1, M14, M25, M31	R1, R2, R3, R4, R5	30,00	1,20
Independent Work M1, M14, M25	R1, R2, R3, R4, R5	60,00	2,40
TOTAL		**90,00**	**3,60**

ON-LINE LEARNING

SYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Synchronous Virtual Session M3, M17	R1, R2, R3, R4, R5	4,00	0,16
Synchronous Vitual Practical Session M5, M16, M19	R1, R2, R3, R4, R5	4,00	0,16
Seminar and Synchronous Virtual Videoconference M7, M21	R1, R2, R3, R4, R5	4,00	0,16
On-site or Synchronous Virtual Assesment M13, M23	R1, R2, R3, R4, R5	3,00	0,12
TOTAL		**15,00**	**0,60**

ASYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Individual Work M14, M25, M31	R1, R2, R3, R4, R5	60,00	2,40
Tutorial Support Sessions M11, M27	R1, R2, R3, R4, R5	5,00	0,20
Group Work M16, M19, M31	R1, R2, R3, R4, R5	10,00	0,40
Discussion Forum M31	R1, R2, R3, R4, R5	10,00	0,40
Continuous Assessment Tasks M1	R1, R2, R3, R4, R5	50,00	2,00
TOTAL		**135,00**	**5,40**

Description of the contents

Description of the necessary contents to acquire the learning outcomes.

Theoretical contents:

Content block	Contents
1.- Data Description: frequencies and its representation	Understand why knowledge of statistics is important. Descriptive vs inferential statistics. Qualitative vs quantitative, and discrete vs continuous.
2.- Description of data: numerical measures	Frequency tables and its representation Summarize quantitative variables with frequency and relative frequency distributions. Display a frequency distribution of quantitative data
3.- Data Description: presentation and analysis	Compute the arithmetic mean, the weighted mean, the median, and the mode. Explain the characteristics, uses, advantages, and disadvantages of each measure of location. Concept and calculation of the standard deviation, variance, and coefficient of variation. Quartiles and interquartile range. Yule-Bowley and Fisher asymmetry indices. Gini concentration index. Characteristics and uses of each measure of dispersion, asymmetry, and concentration. Bivariate descriptive statistics: Crosstabulations , comparison of means, correlation and regression, and their respective graphical representations: grouped bar charts, box plots, scatter plots, and regression lines.
4.- Probability concepts	Define the term probability. Describe the classical, empirical and subjective approaches to probability. Conditional vs. joint probability. Calculate probabilities : rules of addition and rules of multiplication. Bayes' theorem.

5.- Discrete probability distributions	Binomial probability distribution and its application in probability calculations. Poisson probability distribution and its application in probability calculations.
6.- Continuous probability distributions	Describe the characteristics of a normal probability distribution. Describe the standard normal probability distribution and use it to calculate probabilities. Find the score associated with a given probability (percentile calculation), given the mean and standard deviation of a normal distribution. Describe the exponential probability distribution and use it to calculate probabilities.

Temporary organization of learning:

Block of content	Number of sessions	Hours
1.- Data Description: frequencies and its representation	4,00	8,00
2.- Description of data: numerical measures	5,00	10,00
3.- Data Description: presentation and analysis	9,00	18,00
4.- Probability concepts	3,00	6,00
5.- Discrete probability distributions	3,00	6,00
6.- Continuous probability distributions	6,00	12,00

References

·**BASIC BIBLIOGRAPHY:**

·Newbold, Paul, Carlson, William L. & Thorne, Betty (2013) Statistics for Business and Economics. Pearson Prentice Hall / 8th global edition/

·Haslwanter, Thomas (2016) An Introduction to Statistics with Python. Springer.

·Thomas , Dariin (2022). Introductory Statistics Using Python. Sujisola.

·**ADDITIONAL BIBLIOGRAPHY:**

·Salsburg, David. (2002) The Lady Tasting Tea: How Statistics Revolutionized Science in the Twentieth Century ISBN-13 978-0805071344

Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

Situation 1: Teaching without limited capacity (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

Situation 2: Teaching with limited capacity (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

[X] Microsoft Teams

[ ] Kaltura

Situation 3: Confinement due to a new State of Alarm.

In this case, the following changes are made:

1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

X	Microsoft Teams
	Kaltura

Explanation about the practical sessions:

2. System for Assessing the Acquisition of the competences and Assessment System

ONSITE WORK

Regarding the Assessment Tools:

[X] The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

[ ] The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System:

ONLINE WORK

Regarding the Assessment Tools:

[X] The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

[ ] The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

Comments to the Assessment System: