

**1. General information****Course:** STATISTICS**Type:** BASIC**Degree:** 405 - DEGREE IN COMPUTER SCIENCE ENGINEERING (TA)**Center:** 15 - FACULTY OF SOCIAL SCIENCES AND INFORMATION TECHNOLOGIES**Year:** 2**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 42315**ECTS credits:** 6**Academic year:** 2023-24**Group(s):** 60**Duration:** C2**Second language:****English Friendly:** Y**Bilingual:** N**Lecturer:** PHILIPP MANFRED GETTO --- - Group(s): 60

Building/Office	Department	Phone number	Email	Office hours
1.15	MATEMÁTICAS		Philipp.Getto@uclm.es	

2. Pre-Requisites

To pass the subject, the student is required to have certain conceptual and argumentative skills, and the equivalent of an introductory course in Calculus and Algebra.

3. Justification in the curriculum, relation to other subjects and to the profession

The statistics course is the only course where the student will learn statistical techniques in the career. In statistics, the student must learn to make decisions based on data and how to represent them.

This course aims:

- to describe and represent large volumes of data through the main measures of position and dispersion and be able to use graphical representation.
- that the students acquire the necessary techniques for the modeling of situations that represent "Variability".
- to base the decision-making process in general situations, on the basis of incomplete information.
- to familiarize future computer scientists with the fundamental statistical techniques that directly reflect situations related to computer systems, and that they will use in the exercise of their profession.

In addition, you will learn to use powerful statistical programs, which can be obtained free of charge and allows you to download specific packages for a multitude of tasks.

Relationship with other subjects.

This is a subject of vital importance for the student to acquire a working method and a way of thinking and dealing with difficulties in a logical and rigorous manner. The subject will have an interdisciplinary sense relating the problems and examples proposed with other subjects and subjects of the study plan. The concepts studied will be used in almost all the subjects of the intensification of intelligent systems as well as in subjects related to the study of large amounts of data. The student will have tools to describe models with uncertainty and make decisions in the presence of this uncertainty.

Relationship with the profession

Statistics is a cross-cutting subject in a wide variety of disciplines, from physics, chemistry to the social sciences. In recent decades, quality control has brought statistics to practically all companies and is used for decision making in almost all business areas. In IT, its use is very common for preparing reports and its use is very frequent in topics such as Data Mining where there is a growing number of IT professionals working. At the level of consultants, any consultant must have basic knowledge of statistics, just as any computer analyst must know techniques based on inference.

4. Degree competences achieved in this course**Course competences**

Code	Description
BA01	Ability to solve mathematical problems which can occur in engineering. Skills to apply knowledge about: lineal algebra; integral and differential calculus; numerical methods, numerical algorithms, statistics, and optimization.
INS01	Analysis, synthesis, and assessment skills.
PER01	Team work abilities.
SIS01	Critical thinking.
SIS03	Autonomous learning.
UCLM02	Ability to use Information and Communication Technologies.
UCLM03	Accurate speaking and writing skills.

5. Objectives or Learning Outcomes**Course learning outcomes**

Description

Use of proper terms in statistics, as well as reasoning methods in several real situations.

Selection of appropriate statistics tools for the analysis of several types of data depending on their type and source.

Use of statistics software for data analysis and extraction of numerical and graphical signs which summarize relevant information.

6. Units / Contents

Unit 1: Introduction to Statistics

Unit 2: Descriptive Statistics

Unit 2.1 Unidimensional

Unit 2.2 Bidimensional

Unit 3: Probability Theory

Unit 4: Random Variables and Probability distributions**Unit 4.1** Random Variables**Unit 4.2** Probability Distributions**Unit 5: Inferential Statistics****Unit 5.1** Samples and Estimation**Unit 5.2** Contrasting of Hypothesis**Unit 5.3** Introduction to Variation Analysis**7. Activities, Units/Modules and Methodology**

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	BA01	0.9	22.5	N	-	
Individual tutoring sessions [ON-SITE]	Guided or supervised work	BA01	0.18	4.5	N	-	
Other off-site activity [OFF-SITE]	Practical or hands-on activities	BA01 INS01 PER01	0.6	15	N	-	
Study and Exam Preparation [OFF-SITE]	Self-study	BA01 INS01	2.1	52.5	N	-	
Writing of reports or projects [OFF-SITE]	Self-study	BA01 INS01 PER01	0.9	22.5	Y	N	
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA01 INS01 PER01 SIS01 SIS03 UCLM02 UCLM03	0.6	15	Y	N	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	BA01 PER01 SIS01 SIS03 UCLM02 UCLM03	0.42	10.5	Y	Y	
Final test [ON-SITE]	Assessment tests	BA01 INS01 SIS01 UCLM02 UCLM03	0.3	7.5	Y	Y	
Total:			6	150			
Total credits of in-class work: 2.4			Total class time hours: 60				
Total credits of out of class work: 3.6			Total hours of out of class work: 90				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Theoretical papers assessment	15.00%	15.00%	Non-compulsory activity that cannot be retaken. To be carried out before end of teaching period
Laboratory sessions	20.00%	20.00%	Compulsory activity that can be retaken. To be carried out during lab sessions
Final test	55.00%	55.00%	Compulsory activity that can be retaken. To be carried out at the date of the final exams of the ordinary course.
Assessment of active participation	10.00%	10.00%	Non-compulsory activity that cannot be retaken. To be carried out during the theory/lab sessions
Total:	100.00%	100.00%	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:**Continuous assessment:**

In compulsory activities, a minimum mark of 40% is required in order to pass that activity and have the possibility to therefore pass the entire subject. The evaluation of the activities will be global and therefore must be quantified by means of a single mark. If the activity consists of several sections, each section may be evaluated separately provided students are informed in writing of this evaluation criterion at the beginning of the academic year. In the case of the activities that may be retaken (i.e., rescheduling), an alternative activity or test will be offered in the resit/retake exam call (convocatoria extraordinaria).

The partial tests will be common for all the theory/laboratory groups of the subject and will be evaluated by the lecturers of the subject in a serial way, i.e., each part of the final exam will be evaluated by the same lecturer for all the students.

A student is considered to pass the subject if she/he obtains a minimum of 50 points out of 100, taking into account the points obtained in all the evaluable activities, and also has passed all the compulsory activities.

For students who do not pass the subject in the final exam call (convocatoria ordinaria), the marks of activities already passed will be conserved for the resit/retake exam call (convocatoria extraordinaria). The oral presentations assessment (non-recoverable activity) will be conserved for the resit/retake exam call even if it has not been passed. In the case of the passed recoverable activities, the student will have the opportunity to receive an alternative evaluation of those activities in the resit/retake exam call and, in that case, the final grade of the activity will correspond to the latter grade obtained.

The qualification of the passed activities in any call, will be conserved for the next academic year at the request of the student, provided that it is equal or superior to 5 and the training activities and the evaluation criteria of the subject are not modified in the next academic year.

The failure of a student to attend the partial 1 and partial 2 tests will automatically result in her/him receiving a "Failure to attend" (no presentado). If the student has not passed any compulsory evaluation activity, the maximum final grade will be 40%.

Non-continuous evaluation:

Students who cannot regularly assist to the formative activities may apply, at the beginning of the quadrimester to be subject to non continuous evaluation. In the same manner, a student who is realizing the continuous evaluation encounters circumstances that inhibit him from assisting the activities of the continuous evaluation, may apply for non continuous evaluation. In this case the application should be submitted before the date of the exams of the ordinary course in accordance with a deadline to be clarified at the beginning of the semester. Students who are subject to non continuous evaluation will be globally evaluated in two annual courses, an ordinary and an extraordinary, with 100% of the competencies evaluated via the systems specified in the row "Non continuous evaluation". In the "Non continuous" mode it is not mandatory that grades of activities acquired during continuous evaluation are saved

Specifications for the resit/retake exam:

Evaluation tests will be conducted for all recoverable activities.

Specifications for the second resit / retake exam:

Same characteristics as the resit/retake exam call.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents	
Hours	hours
Individual tutoring sessions [PRESENCIAL][Guided or supervised work]	4.5
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Final test [PRESENCIAL][Assessment tests]	7.5
General comments about the planning: The subject is taught in three weekly sessions of 1.5 hours.	
Unit 1 (de 5): Introduction to Statistics	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	3.5
Unit 2 (de 5): Descriptive Statistics	
Activities	Hours

Class Attendance (theory) [PRESENCIAL][Lectures]	6
Study and Exam Preparation [AUTÓNOMA][Self-study]	13
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	3
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3
Unit 3 (de 5): Probability Theory	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	12
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	2
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Unit 4 (de 5): Random Variables and Probability distributions	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	6
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	7
Study and Exam Preparation [AUTÓNOMA][Self-study]	12
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	2
Unit 5 (de 5): Inferential Statistics	
Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	6
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	8
Study and Exam Preparation [AUTÓNOMA][Self-study]	12
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	5
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	3.5
Global activity	
Activities	hours
Writing of reports or projects [AUTÓNOMA][Self-study]	22.5
Final test [PRESENCIAL][Assessment tests]	7.5
Class Attendance (theory) [PRESENCIAL][Lectures]	22.5
Problem solving and/or case studies [PRESENCIAL][Problem solving and exercises]	15
Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities]	10.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Individual tutoring sessions [PRESENCIAL][Guided or supervised work]	4.5
Total horas: 150	

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Montgomery, Douglas C.	Applied statistics and probability for engineers	John Wiley & Sons		978-1-118-74412-3	2014	
Walpole, Ronald E.	Probabilidad y estadística para ingenieros	Prentice-Hall Hispanoamericana		970-17-0264-6	1999	
Nájera López, Alberto	Sobrevivir a la estadística en 40 páginas y con 7 ejercicios				2014	
Gómez, Arriaza	Estadística Básica con R y R- Commander UCA http://knuth.uca.es/ebrcmdr			978-84-9828186-6	2008	
Novo Sanjurjo, Vicente	Estadística teórica y aplicada	Sanz y Torres		84-96094-30-8	2004	
Fernández Guerrero, Mercedes	Manual de estadística para ingenieros	Casa Ruiz Morote		84-934398-2-8	2007	
Álvarez Contreras, Sixto Jesús	Estadística aplicada : teoría y problemas	CLAG		84-921847-4-4	2000	