UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

1. General information

Course: STATISTICS

Type: BASIC

Degree: 347 - DEGREE PROGRAMME IN COMPUTER SCIENCE ENGINEERING (CR)

Center: 108 - SCHOOL OF COMPUTER SCIENCE OF C. REAL

Year: 2

Main language: English

Use of additional languages: Use of English as the main language of teaching in the bilingual group and Spanish in the rest of the groups.

Web site: https://campusvirtual.uclm.es

Code: 42315

ECTS credits: 6

Academic year: 2021-22

Group(s): 20 21 22

Duration: C2

Second language: Spanish

English Friendly: N

Bilingual: Y

Lecturer: EUSEBIO ANGULO SANCHEZ HERRERA - Group(s): 20 21 22

Building/Office	Department	Phone number	Email	Office hours
2.17	MATEMÁTICAS	926295300 EXT 3711	eusebio.angulo@uclm.es	Available at https://esi.uclm.es/categories/profesorado-y-tutorias

Lecturer: VICTOR MANUEL CASERO ALONSO - Group(s): 20

Building/Office	Department	Phone number	Email	Office hours
Politécnico/2-A15	MATEMÁTICAS	926052867	victormanuel.casero@uclm.es	Available at https://esi.uclm.es/categories/profesorado-y-tutorias

Lecturer: JUAN JOSE MUÑOZ MUÑOZ - Group(s): 20

Building/Office	Department	Phone number	Email	Office hours
	MATEMÁTICAS		JuanJose.MunozMunoz@uclm.es	

2. Pre-Requisites

To pass the course, 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 students learn statistical techniques in the degree. The student must learn to make decisions based on data and how to represent them.
This course aims to:
- Describe and represent large amounts of data through the main measures of location and dispersion and be able to use graphs.
- To help students acquire the necessary skills for modeling situations with "Variability" techniques.
- Basing the decision-making process in general situations on the basis of incomplete information.
- To familiarize the future with computer techniques that directly reflect key statistics related to computer systems situations, and to use in the exercise of their profession.
In addition you will learn to use very powerful computer languages such as R. The last one available for free download and allow a multitude of statistical tasks with specific packages.

Relationship to other subjects.

This is a subject of vital importance that students acquire a working method and a way of thinking and dealing with the difficulties of logic and rigorous manner. The course will take an interdisciplinary sense connecting problems and proposed materials and examples with other subjects of the curriculum. The concepts studied are used in almost all subjects of enhanced smart systems as well as in matters relating to the study of large amounts of data.
The student will describe tools for models with uncertainty and make decisions in the presence of this uncertainty.

Relationship between the profession

Statistics is a transverse field in a wide variety of disciplines, from physics, chemistry to social sciences. In recent decades, the quality control has approached statistical virtually all businesses and is used for decision making in almost all business areas.
In computing, it is common use for reporting and is also frequently used in areas such as data mining where there is an increasing number of computer professionals working. A level consultants, any consultant should have basic knowledge of statistics, like any computer analyst must know based inference techniques.

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

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

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

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 Univariate Descriptive Statistics

    Unit 2.2 Miultivariate Descriptive Statistics

Unit 3: Event Probability

Unit 4: Random Variables and Probability Distributions

    Unit 4.1 Random Variables

    Unit 4.2 Probability Distributions

Unit 5: Inference tools

    Unit 5.1 Sampling and estimation

    Unit 5.2 Hypothesis testing

    Unit 5.3 Introduction to Analysis of Variance

ADDITIONAL COMMENTS, REMARKS

Laboratory practices on the topics of Theory in with the R software.

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	-	Teaching of the subject matter by lecturer (MAG)
Individual tutoring sessions [ON-SITE]	Guided or supervised work	BA01	0.18	4.5	N	-	Individual or small group tutoring in lecturer¿s office, classroom or laboratory (TUT)
Other off-site activity [OFF-SITE]	Practical or hands-on activities	BA01 INS01 PER01	0.6	15	N	-	Lab practical preparation (PLAB)
Study and Exam Preparation [OFF-SITE]	Self-study	BA01 INS01	2.1	52.5	N	-	Self-study (EST)
Writing of reports or projects [OFF-SITE]	Self-study	BA01 INS01 PER01	0.9	22.5	Y	N	Preparation of essays on topics proposed by lecturer (RES)
Problem solving and/or case studies [ON-SITE]	Problem solving and exercises	BA01 INS01 PER01 SIS01 SIS03 UCLM02 UCLM03	0.6	15	Y	N	Worked example problems and cases resolution by the lecturer and the students (PRO)
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	BA01 PER01 SIS01 SIS03 UCLM02 UCLM03	0.42	10.5	Y	Y	Realization of practicals in laboratory /computing room (LAB)
Final test [ON-SITE]	Assessment tests	BA01 INS01 SIS01 UCLM02 UCLM03	0.3	7.5	Y	Y	Final test of the complete syllabus of the subject (EVA)
		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
Final test	50.00%	50.00%	Compulsory activity that can be retaken (rescheduling) to be carried out within the planned exam dates of the final exam call (ordinary exam).
Theoretical papers assessment	15.00%	15.00%	Non-compulsory activity that can be retaken. To be carried out before end of teaching period
Laboratory sessions	25.00%	25.00%	Compulsory activity that can be retaken. To be carried out during lab sessions
Assessment of active participation	10.00%	0.00%	Non-compulsory activity that can be retaken. To be carried out during the theory/lab sessions for the students of the continuous modality. The students of non-continuous modality will be 0%.
Total:	**100.00%**	**90.00%**	

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. 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 final exam 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 examcall (convocatoria extraordinaria). If an activity is not recoverable, its assessment will be preserved for the resit/retake exam call (convocatoria extraordinaria) 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 mark of the passed activities in any call, except for the final exam, will be conserved for the subsequent academic year at the request of the student, provided that mark is equal or greater than 50% and that the activities and evaluation criteria of the subject remain unchanged prior to the beginning of that academic year.

The failure of a student to attend the final exam 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 may apply at the beginning of the semester for the non-continuous assessment mode. In the same way, the student may change to the non-continuous evaluation mode as long as she/he has not participated during the teaching period in evaluable activities that together account for at least 50% of the total mark of the subject. If a student has reached this 50% of the total obtainable mark or the teaching period is over, she/he will be considered in continuous assessment without the possibility of changing to non-continuous evaluation mode.

Students who take the non-continuous evaluation mode will be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences), through the assessment systems indicated in the column "Non-continuous evaluation".

In the "non-continuous evaluation" mode, it is not compulsory to keep the mark obtained by the student in the activities or tests (progress test or partial test) taken in the continuous assessment mode.

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 3 x 1,5 hour sessions per week.	
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): Event Probability	
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): Inference tools	
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**
Class Attendance (theory) [PRESENCIAL][Lectures]	22.5
Individual tutoring sessions [PRESENCIAL][Guided or supervised work]	4.5
Other off-site activity [AUTÓNOMA][Practical or hands-on activities]	15
Study and Exam Preparation [AUTÓNOMA][Self-study]	52.5
Writing of reports or projects [AUTÓNOMA][Self-study]	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
Final test [PRESENCIAL][Assessment tests]	7.5
Total horas:	**150**

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