UNIVERSIDAD DE CASTILLA - LA MANCHA
GUÍA DOCENTE

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1. General information

Course: STATISTICS

Type: BASIC

Degree: 406 - UNDERGRADUATE DEGREE IN COMPUTER SCIENCE AND ENGINEERING (AB)

Center: 604 - SCHOOL OF COMPUTER SCIENCE AND ENGINEERING (AB)

Year: 2

Main language: Spanish

Use of additional languages:

Web site:

Code: 42315

ECTS credits: 6

Academic year: 2022-23

Group(s): 10 11 12

Duration: C2

Second language: English

English Friendly: N

Bilingual: Y

Lecturer: **FERNANDO ANDRÉS PRETEL** - Group(s): **11 12**

Building/Office	Department	Phone number	Email	Office hours
ESII	MATEMÁTICAS		Fernando.APretel@uclm.es	

Lecturer: **FRANCISCO PARREÑO TORRES** - Group(s): **10 11 12**

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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.

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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.

-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 a SPSS software and a very powerful language such as R, available for free download specific packages and allows for a multitude of tasks statistical program.

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.

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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.
INS04	Problem solving skills by the application of engineering techniques.

PER01	Team work abilities.
PER04	Interpersonal relationship skills.
SIS04	Adaptation to new scenarios.
SIS05	Creativity.
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: Descriptive Statistics

    Unit 1.1 Measures of central Tendency

    Unit 1.2 Measures of central Tendency

    Unit 1.3 Measures of spread

    Unit 1.4 Graphing

Unit 2: Probability

    Unit 2.1 Conditional probability Theme

    Unit 2.2 Subject Rule bayes

Unit 3: Random Variable

    Unit 3.1 Continuous Random Variables

    Unit 3.2 Discrete Random Variables

Unit 4: Foundations for inference

    Unit 4.1 Sample in random distributions

Unit 5: Statistical inference

    Unit 5.1 Puntual estimation

    Unit 5.2 Interval estimation

Unit 6: Hypothesis testing

    Unit 6.1 Parametric testing

    Unit 6.2 Non parametric testing

Unit 7: ANOVA

Unit 8: Regression and Correlation

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Progress test [ON-SITE]	Lectures	BA01 INS04 PER01	0.16	4	Y	N	
Laboratory practice or sessions [ON-SITE]	Assessment tests	INS04 PER01 PER04 UCLM03	0.6	15	Y	Y	
Problem solving and/or case studies [ON-SITE]	Cooperative / Collaborative Learning	BA01 INS04 PER01 SIS04 SIS05 UCLM03	0.32	8	Y	Y	
Project or Topic Presentations [ON-SITE]	Lectures	SIS04 SIS05 UCLM03	0.24	6	Y	N	
Class Attendance (theory) [ON-SITE]	Lectures	BA01 INS04	1.28	32	N	-	
Study and Exam Preparation [OFF-SITE]	Self-study	BA01 INS04	1.76	44	N	-	
Writing of reports or projects [OFF-SITE]	Combination of methods	BA01 INS04 SIS04 SIS05 UCLM03	0.84	21	N	-	
Other off-site activity [OFF-SITE]	Case Studies	BA01 INS04 PER01	0.8	20	N	-	
		Total:	**6**	**150**			
	Total credits of in-class work: 2.6					**Total class time hours: 65**	
	Total credits of out of class work: 3.4					**Total hours of out of class work: 85**	

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
Oral presentations assessment	10.00%	0.00%	Oral presentation of work/problems ([PRES] 10%).
Progress Tests	50.00%	0.00%	The acquisition of the knowledge will be evaluated by means of two optional partial exams, which will be worth 20% of the grade, for the first partial exam and 80% of the grade for the second partial exam ([ESC] 50%) A minimum score of 3.5 out of 10 is required in each partial to

Laboratory sessions	25.00%	25.00%	average out the rest of the tests. Each practice will be evaluated by means of a questionnaire. And there will be a final questionnaire ([LAB] 25%). Performed individually.
Assessment of problem solving and/or case studies	15.00%	75.00%	A series of exercises proposed by the teacher will be given on the dates indicated ([INF] 15%). Carried out in groups.
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:

   The student who does not pass all the minimum tests required in the subject will have a grade not higher than 4.00 even if the average obtained was another, including more than 5.00.

   Note the superseded parts is saved.
   In the case of not having passed the theoretical part, an examination which must be overcome with a minimum grade of 4 out of 10, counting 50% of the note is held.
   The practices and problem will not be recovered in the regular exam session.

   Non-continuous evaluation:

   A practices exam, counting 25% of the grade.
   A Problem and theoretical exam, counting 75% of this note.

   Change from continuous to non-continuous assessment. Any student may change to non-continuous assessment if he/she has not been assessed for 50% of the mark by continuous assessment or if he/she has completed the term of the four-month period.
   "By default, the student will be assessed by continuous assessment. If you wish to change to non-continuous assessment, you must indicate this through the following link https://www.esiiab.uclm.es/alumnos/evaluacion.php before the end of the term teaching period. In the event that 50% of the continuous assessment is done before the end of the term, this must be clearly indicated in the previous paragraph, and indicate that the deadline for the change will appear on the virtual campus of the subject

Specifications for the resit/retake exam:

Note the practical parts is saved if the student do not want to repeat the exam to upgrade the note.
The rest is assessed with an exam counting 75% of the grade.

Specifications for the second resit / retake exam:

A practices exam, counting 25% of the grade.
A Problem and theoretical exam, counting 75% of this note.

9. Assignments, course calendar and important dates
Not related to the syllabus/contents

Hours	hours

General comments about the planning: This course schedule is APPROXIMATE. It could vary throughout the academic course due to teaching needs, bank holidays, etc. A weekly schedule will be properly detailed and updated on the online platform (Virtual Campus). Note that all the lectures, practice sessions, exams and related activities performed in the bilingual groups will be entirely taught and assessed in English. Classes will be scheduled in 3 sessions of one hour and a half per week.

Unit 1 (de 8): Descriptive Statistics

Activities	Hours
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	2
Project or Topic Presentations [PRESENCIAL][Lectures]	2
Class Attendance (theory) [PRESENCIAL][Lectures]	6
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Writing of reports or projects [AUTÓNOMA][Combination of methods]	1
Other off-site activity [AUTÓNOMA][Case Studies]	3

Unit 2 (de 8): Probability

Activities	Hours
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	2
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	2
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	4
Writing of reports or projects [AUTÓNOMA][Combination of methods]	2
Other off-site activity [AUTÓNOMA][Case Studies]	3

Unit 3 (de 8): Random Variable

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Study and Exam Preparation [AUTÓNOMA][Self-study]	5
Writing of reports or projects [AUTÓNOMA][Combination of methods]	4
Other off-site activity [AUTÓNOMA][Case Studies]	2

Unit 4 (de 8): Foundations for inference

Activities	Hours
Progress test [PRESENCIAL][Lectures]	2
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	2
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	4

Writing of reports or projects [AUTÓNOMA][Combination of methods]	2
Other off-site activity [AUTÓNOMA][Case Studies]	2

Unit 5 (de 8): Statistical inference

Activities	Hours
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	2
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	2
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	9
Writing of reports or projects [AUTÓNOMA][Combination of methods]	5
Other off-site activity [AUTÓNOMA][Case Studies]	3

Unit 6 (de 8): Hypothesis testing

Activities	Hours
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	2
Project or Topic Presentations [PRESENCIAL][Lectures]	1
Class Attendance (theory) [PRESENCIAL][Lectures]	5
Study and Exam Preparation [AUTÓNOMA][Self-study]	7
Writing of reports or projects [AUTÓNOMA][Combination of methods]	2
Other off-site activity [AUTÓNOMA][Case Studies]	2

Unit 7 (de 8): ANOVA

Activities	Hours
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	2
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	2
Project or Topic Presentations [PRESENCIAL][Lectures]	2
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	4
Writing of reports or projects [AUTÓNOMA][Combination of methods]	2
Other off-site activity [AUTÓNOMA][Case Studies]	3

Unit 8 (de 8): Regression and Correlation

Activities	Hours
Progress test [PRESENCIAL][Lectures]	2
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	3
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	2
Class Attendance (theory) [PRESENCIAL][Lectures]	4
Study and Exam Preparation [AUTÓNOMA][Self-study]	8
Writing of reports or projects [AUTÓNOMA][Combination of methods]	3
Other off-site activity [AUTÓNOMA][Case Studies]	2

Global activity

Activities	hours
Progress test [PRESENCIAL][Lectures]	4
Laboratory practice or sessions [PRESENCIAL][Assessment tests]	15
Project or Topic Presentations [PRESENCIAL][Lectures]	6
Study and Exam Preparation [AUTÓNOMA][Self-study]	44
Writing of reports or projects [AUTÓNOMA][Combination of methods]	21
Other off-site activity [AUTÓNOMA][Case Studies]	20
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	8
Class Attendance (theory) [PRESENCIAL][Lectures]	32
Total horas:	150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
David M Diez,Christopher D Barr,Mine C etinkaya-Rundel	OpenIntro Statistics http://www.openintro.org/stat/textbook.php					
Devore, Jay L.	Probabilidad y estadística para ingeniería y ciencias	International Thomson		970-686-067-3	2001	
Montgomery, Douglas C.	Probabilidad y estadística aplicadas a la ingeniería	Limusa Wiley		978-968-18-5915-2	2007	
Walpole, Ronald E.	Probabilidad y estadística para ingenieros	Prentice-Hall Hispanoamericana		970-17-0264-6	1999	