

**1. General information****Course:** STATISTICS**Type:** BASIC**Degree:** 346 - DEGREE IN COMPUTER SCIENCE AND ENGINEERING**Center:** 604 - SCHOOL OF COMPUTER SCIENCE AND ENGINEERING (AB)**Year:** 2**Main language:** Spanish**Use of additional languages:** English group I**Web site:****Code:** 42315**ECTS credits:** 6**Academic year:** 2019-20**Group(s):** 10 11 12**Duration:** C2**Second language:** English**English Friendly:** N**Bilingual:** Y**Lecturer:** MARIA JOSE HARO DELICADO - Group(s): 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.

**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.

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

Code	Description
BA1	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.
INS4	Problem solving skills by the application of engineering techniques.
PER1	Team work abilities.

PER4	Interpersonal relationship skills.
SIS4	Adaptation to new scenarios.
SIS5	Creativity.
UCLM3	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.

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

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

## 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 1.5 Some basic concepts

### 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	R	Description
Progress test [ON-SITE]	Lectures	BA1 INS4 PER1	0.16	4	Y	N	Y	
Laboratory practice or sessions [ON-SITE]	Assessment tests	INS4 PER1 PER4 UCLM3	0.6	15	Y	Y	N	
Problem solving and/or case studies [ON-SITE]	Cooperative / Collaborative Learning	BA1 INS4 PER1 SIS4 SIS5 UCLM3	0.32	8	Y	N	Y	
Project or Topic Presentations [ON- SITE]	Lectures	SIS4 SIS5 UCLM3	0.24	6	Y	Y	N	
Class Attendance (theory) [ON- SITE]	Lectures	BA1 INS4	1.28	32	N	-	-	
Study and Exam Preparation [OFF- SITE]	Self-study	BA1 INS4	1.76	44	N	-	-	
Writing of reports or projects [OFF- SITE]	Combination of methods	BA1 INS4 SIS4 SIS5 UCLM3	0.84	21	N	-	-	
Other off-site activity [OFF-SITE]	Case Studies	BA1 INS4 PER1	0.8	20	N	-	-	
<b>Total:</b>			<b>6</b>	<b>150</b>				
<b>Total credits of in-class work: 2.6</b>				<b>Total class time hours: 65</b>				
<b>Total credits of out of class work: 3.4</b>				<b>Total hours of out of class work: 85</b>				

As: Assessable training activity

Com: Training activity of compulsory overcoming

R: Rescheduling training activity

## 8. Evaluation criteria and Grading System

Evaluation System	Grading System		Description
	Face-to-Face	Self-Study Student	
Progress Tests	50.00%	0.00%	
Assessment of problem solving and/or case studies	15.00%	0.00%	
Oral presentations assessment	10.00%	0.00%	
Laboratory sessions	25.00%	0.00%	

<b>Total:</b>	<b>100.00%</b>	<b>0.00%</b>	
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#### Evaluation criteria for the final exam:

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.

The activities of evaluation or recovery of classes could be planned, exceptionally, in the afternoon.

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.

#### 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
<b>General comments about the planning:</b> 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. The assessment activities could be performed in the afternoon, in case of necessity.	
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
Problem solving and/or case studies [PRESENCIAL][Cooperative / Collaborative Learning]	8
Project or Topic Presentations [PRESENCIAL][Lectures]	6
Class Attendance (theory) [PRESENCIAL][Lectures]	32
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
<b>Total horas: 150</b>	

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 <a href="http://www.openintro.org/stat/textbook.php">http://www.openintro.org/stat/textbook.php</a>					
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	