

SUBJECT TEACHING GUIDE

G1958 - Statistics

First Degree in Civil Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	First Degree in Civil Engineering			Type and Year	Core. Year 1
Faculty	School of civil Engineering				
Discipline	BASIC MATHEMATICS FOR ENGINEERING				
Course unit title and code	G1958 - Statistics				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Knowledge Field					
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICA APLICADA Y CIENCIAS DE LA COMPUTACION				
Name of lecturer	CARMEN MARIA SORDO GARCIA				
E-mail	carmen.sordo@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 1. DESPACHO PROFESORES (1042)				
Other lecturers	PAULA CAMUS BRAÑA MARIA DOLORES FRIAS DOMINGUEZ				

4. OBJECTIVES
The overall objective of the subject is the acquisition by the student of a way of thinking that will allow him to approach practical problems in a logical and systematic way from the statistical knowledge and tools learned.
Be aware that the variables involved in engineering problems are fundamentally random
Familiarize students with basic statistical methods and procedures. Using probability calculations and statistical inference as methodologies, the course will aim to characterize variability and quantify randomness.
Understand how random variables are treated in engineering problems.
Introduce students to the use of appropriate software for solving scientific and technical problems in the context of engineering.

6. SUBJECT PROGRAM	
CONTENTS	
1	Part I
2	Lesson 1: Descriptive Statistics: Tables, statistics and graphics.
3	Lesson 2. Probability Probability and properties, conditional probability and Bayes theorem.
4	Part II
5	Lesson 3. Random variables: Discrete and continuous random variables. Probability density function and cumulative distribution function.
6	Lesson 4. Common probability distributions: Most common probability distributions. Approximation to the Normal distribution.
7	Part III
8	Lesson 5. Statistics of extremes: Order statistics, Exact and asymptotic distributions of order statistics. Excedences.
9	Lesson 6. Probabilistic paper: Probabilistic paper concepts. Some probabilistic papers (Normal, Log-Normal and extreme probability paper)
10	Part IV
11	Lesson 7. Inference: Introduction. Inference of proportion, mean and variance.
12	Lesson 8. Hypothesis testing: Introduction. Hypothesis testing of proportion, mean and variance. Page

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Writing exam Part I	Written exam	No	Yes	19,00
Writing exam Part II	Written exam	No	Yes	22,00
Writing exam Part III	Written exam	No	Yes	13,00
Writing exam Part IV	Written exam	Yes	Yes	16,00
Practical exams	Work	No	No	20,00
Seminars and other activities.	Work	No	No	10,00
TOTAL				100,00
Observations				
<p>During the extraordinary examination period, students may only take those exams marked as recoverable that they have failed. The final grade for the course in the extraordinary session, for those students who take a recovery exam, will be the weighted average of the different evaluation methods described in the course syllabus and carried out during the course . To pass the course, it is necessary to obtain a grade of more than 30% of the total from the written exams.</p>				
Observations for part-time students				
<p>he subject can be followed through the Moodle website. Part-time enrolled students (and only these students) may complete practical tests remotely, and they may request to take written tests simultaneously during the established exam period. Proposed coursework throughout the course will be done individually and can be submitted electronically.</p>				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Luceño, A.; González, F.J. 2003. "Métodos Estadísticos para Medir, Describir y Controlar la Variabilidad". Santander: Universidad de Cantabria. ISBN: 978-84-8102-750-1. <http://catalogo.unican.es/cgi-bin/abnetopac/?TITN=214714>

Castillo, E.; Pruneda, R.E. 2001. "Estadística Aplicada". Albacete: Moralea. ISBN: 978-84-923157-4-1. <http://catalogo.unican.es/cgi-bin/abnetopac/?TITN=185711>

Cohen, Y.; Cohen, J.Y. 2008. "Statistics and data with R: an applied approach through examples". Chichester:: John Wiley & Sons. ISBN: 978-0-470-75805-2. <http://catalogo.unican.es/cgi-bin/abnetopac/?TITN=292113>