SUBJECT TEACHING GUIDE

G1958 - Statistics

Degree in Civil Engineering

Academic year 2021-2022

1. IDENTIFYING DATA					
Degree	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)	
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
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Other lecturers	MARIA DOLORES FRIAS DOMINGUEZ

3.1 LEARNING OUTCOMES
- Summarize information contained in large amounts of data through statistics, tables, and graphs.
- Calculate probabilities in practical problems.
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- Random variables for modeling real phenomena.
- Recognize real situations in which the most common probability distributions appear
- Modelling statistically extreme events
- Knowing and aply properties of inference
- Develop computer skills to the practice of statistics in engineering.

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
Introduce the student to basic statistical methods and procedures that allow him to summarize information from a large amount of data, characterize variability, or quantify chance.
Knowing how random variables work in engineering problems
Instill in our students a proper use of statistical software to solve scientific problems in engineering.

6. COURSE ORGANIZATION	
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	14,00
Writing exam Part II	Written exam	No	Yes	20,00
Writing exam Part III	Written exam	No	Yes	15,00
Writing exam Part IV	Written exam	Yes	Yes	16,00
Practical exams	Laboratory evaluation	No	No	20,00
Seminars and other activities.	Work	No	No	15,00
TOTAL				100,00

Observations

The subject is taught and assessed in English only.
In the repeat exam period, students are only allow to repeat failed exams.
Marks obtained along the year will be valid until the extra call.
The final mark for the repeat exam period will be the weighted average of the different evaluation methodologies indicated in this guide.
The sum of the resulting marks from the writing exams should be more than 30% of the total mark of the subject to pass the subject.

Observations for part-time students

The subject can be followed from Moodle.
If required at the beginning of the term, part-time students can do writing exams together the day fixed for the final exam.
Practicl Exams, Works and seminars proposed along the course can be done individually and submitted electronically .

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