SUBJECT TEACHING GUIDE

G48 - Basic Statistics

Double Degree in Physics and Mathematics
Degree in Mathematics

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Double Degree in Physics and Mathematics Degree in Mathematics			Type and Year	Core. Year 1 Core. Year 1
Faculty	Faculty of Sciences				
Discipline	Basic Related Subject Area: Basic Module				
Course unit title and code	G48 - Basic Statistics				
Number of ECTS credits allocated	6	Term		Semester based (2)	
Knowledge Field	Mathematics and statistics				
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION
Name of lecturer	ALICIA NIETO REYES
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Other lecturers	ARACELI TUERO DIAZ

4. OBJECTIVES
Developing an intuition about randomness.
Understanding basic principles of Probability.
Understanding basic principles of Statistics.
Managing and understanding the different methods of statistical inference, recognizing its applicability to real problems
Being able to use basic method to summarize datasets
Calculate probability of events in a discrete probability space.
Recognizing real situations where the most common probability distributions appear.

Using the concept of independence in simple cases and apply the central limit theorem.
Check the accuracy of certain assumptions through hypothesis test

6. SUBJECT PROGRAM	
CONTENTS	
1	DESCRIPTIVE STATISTICS. GRAPHICAL REPRESENTATIONS. Population and sample. Descriptive statistics and statistical inference. Types of data. Types of variables. Measures of central tendency and dispersion. Graphical representations.
2	COMBINATORIAL PROBLEMS. Ordered and unordered samples.
3	DISCRETE PROBABILITY SPACES. Discrete probability spaces. Independence. Bernouilli trials. Conditional probability. Bayes theorem.
4	RANDOM VARIABLES. Random variable. Measures of central tendency and dispersion. Linear regression and correlation.
5	LIMIT THEOREMS. The Law of Large Numbers. Poisson distribution and normal distribution as a limit of binomial distributions.
6	HYPOTHESIS TESTING. Hypothesis tests about the mean of a normal population. Hypothesis tests to compare means of two normal populations (independent samples). Comparing two proportions.
7	CONTINGENCY TABLES. GOODNESS OF FIT TESTS. Test for multinomial distribution.
8	Final exam
9	Tutorial

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessment	%
It will be an exam of Chapters 1 to 3.	Written exam	No	Yes	50,00
Final exam.	Written exam	Yes	Yes	50,00
TOTAL				100,00
Observations				
Students who have passed the first exam have the opportunity to do a new exam in June to get a higher grade.				
Observations for part-time students				
The assessment of part-time students follow the same rules as the assessment of full-time students				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
CUESTA ALBERTOS y TUERO DIAZ (2006) Apuntes de estadística básica. GORDON, H. (1997). Discrete Probability. Springer. Nueva York. HUNTSBERGER, D.V. y BILLINGSLEY, P. (1983). Elementos de estadística inferencial. Continental, México