SUBJECT TEACHING GUIDE

G2003 - Probability

Double Degree in Physics and Mathematics
Degree in Mathematics

Academic year 2023-2024

1. IDENTIFYING DATA				
Degree	Double Degree in Physics and Mathematics Degree in Mathematics		Type and Year	Compulsory. Year 3 Compulsory. Year 3
Faculty	Faculty of Sciences			
Discipline	Subject Area: Probability and Statistics Module: Compulsory Subjects			
Course unit title and code	G2003 - Probability			
Number of ECTS credits allocated	6	Term	Semester based (1)	
Web				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION
Name of lecturer	ARACELI TUERO DIAZ
E-mail	araceli.tuero@unican.es
Office	Facultad de Ciencias. Planta: + 1. DESPACHO PROFESORES (1052)
Other lecturers	JUAN ANTONIO CUESTA ALBERTOS ALICIA NIETO REYES

3.1 LEARNING OUTCOMES
- Knowledge and use of the basic concepts of probability.
- It aims an advanced manipulation of the fundamental tools of probability

4. OBJECTIVES
It is intended to give a correct formalization of the basic concepts of probability and study sequences of independent random variables and associated limit theorems.

6. COURSE ORGANIZATION

	CONTENTS
1	PROBABILITY SPACES. General probability spaces. Probability measures on the real line.
2	RANDOM VARIABLES. Random variable. Distribution functions of random variables.
3	RANDOM VECTORS. INDEPENDENCE. Random Vectors. Marginal probability. Conditional probability. Independence.
4	MEAN AND MOMENTS OF HIGHER ORDER. Expected value of a random variable. Moments of higher order. Inequalities
5	SEQUENCES OF RANDOM VARIABLES. CONVERGENCE. Almost sure convergence, convergence in probability and convergence in law.
6	LIMIT THEOREMS. An introduction to the Law of Large Numbers, Borel-Cantelli Theorems and Central Limit Theorem.
7	Final exam
8	Tutorial

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Continuous evaluation	Others	No	Yes	40,00
Final evaluation	Written exam	Yes	Yes	60,00
TOTAL				100,00
Observations				
Taking part in any of the activities of evaluation implies that the student has undergone the evaluation process.				
Observations for part-time students				
The assessment of part-time students follow the same rules as the assessment of full-time students. Taking part in any of the two activities of evaluation implies that the student has done the evaluation				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
CUESTA ALBERTOS (2006). Apuntes de Cálculo de Probabilidades
VELEZ IBARROLA, R. (2004) Cálculo de Probabilidades 2. Ediciones Académicas. Madrid
WILLIAMS, D. (2001). Weighing the odds: A course in probability and statistics. Cambridge University Press. Cambridge