SUBJECT TEACHING GUIDE

359 - Probability and Statistics

Master's Degree in Mathematics and Computing

Academic year 2026 - 2027

1. IDENTIFYING DATA					
Degree	Master's Degree in Mathematics and Computing			Type and Year	Compulsory. Year 1
Faculty	Faculty of Sciences				
Discipline					
Course unit title and code	359 - Probability and Statistics				
Number of ECTS credits allocated	3	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	LUIS GONZALEZ DE LA FUENTE
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Other lecturers	

3.1 LEARNING OUTCOMES

To know, comprehend and be able to apply advance techniques of Probability and Statistics in professional situations and in doing research in Mathematics and Computation.

4. OBJECTIVES

Provide the students with the proficiency and techniques required for the professional environment and the research in probability and statistics.

6. COURSE ORGANIZATION

CONTENTS

1	Advance probability (inequalities of Hoeffdfing, Jensen and Tchevichev, strong law of large numbers, Kullback-Leibler divergence)
2	Statistical depth functions.
3	Nonparametric hypothesis testing (permutation methods and bootstrap)
4	Kernel density estimators.
5	Sequential analysis.
6	Stochastic processes. Markov chains.
7	Monte Carlo methods.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessment	%
Continuous evaluation	Work	Yes	Yes	100,00
TOTAL				100,00
Observations				
Each student will write a paper related to the topic studied in class; it can be either of bibliographic or research nature.				
Observations for part-time students				
The evaluation of students at part time follows the same criteria than of students at full time.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Probability and Statistics (4th Edition) 2011. Morris H. DeGroot , Mark J. Schervish