

SUBJECT TEACHING GUIDE

M1965 - STATISTICS FOR DATA SCIENCE

University Master's Degree in Data Science

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	University Master's Degree in Data Science			Type and Year	Compulsory. Year 1
Faculty	Faculty of Sciences				
Discipline	METHODS IN SCIENCE DATA				
Course unit title and code	M1965 - STATISTICS FOR DATA SCIENCE				
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	MARCOS CRUZ RODRIGUEZ				
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Other lecturers	PABLO MARTINEZ RUIZ DEL ARBOL JESUS FERNANDEZ FERNANDEZ DANIEL GARCIA DIAZ				

3.1 LEARNING OUTCOMES
- Knowledge of descriptive statistics
- Knowledge of sampling and Monte Carlo techniques
- Knowledge of statistical inference
- Knowledge of parametric and non-parametric hypothesis testing
- Knowledge of Bootstrap methods
- Knowledge of regression models and maximum likelihood estimation
- Knowledge of regularization and ridge regression

4. OBJECTIVES

Learn descriptive statistics
Learn sampling and Monte Carlo techniques
Learn statistical inference
Learn parametric and non-parametric hypothesis testing
Learn Bootstrap techniques
Learn regression models and maximum likelihood estimation
Learn regularization and ridge regression

6. COURSE ORGANIZATION

CONTENTS	
1	1. Descriptive Statistics 2. Sampling and Monte Carlo methods 3. Statistical inference in 1- dimension and n-dimensions
2	5. Bootstrap 6. Regression models. Maximum Likelihood Estimation 7. Regularization. Ridge Regression

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Written exam	Written exam	Yes	Yes	40,00
Evaluation of written exercises and reports	Work	Yes	Yes	60,00
TOTAL				100,00
Observations				
Observations for part-time students				
Part time students will be evaluated as the other students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC
María Dolores Ugarte, Ana F. Militino, and Alan T. Arnholt: "Probability and Statistics with R", Second Edition. Chapman & Hall 2015.
Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani: "An Introduction to Statistical Learning" (with Applications in R). Springer-Verlag 2013.