Universidad Carlos III de Madrid

SUBJECT: FUNCTIONAL DATA ANALYSIS		
MASTER DEGREE: MASTER IN STATISTICS FOR DATA SCIENCE Professor: M. Carmen Aguilera Morillo	ECTS: 3	QUARTER: 2

TIMETABLE FOR THE SUBJECT

WEEK	SESSION	DESCRIPTION OF EACH SESSION	GROUP (X mark)		Indicate if a different lecture room is needed (computer, audiovisual, etc.)	HOMEWORK PER WEEK		
			1	2		DESCRIPTION	ATTENDING HOURS	HOMEWORK Max. 7H/WEEK
1	1	Introduction to functional data analysis. Data representation. Usual basis. Smoothing with B-splines. Practical exercises with R.	X			Revision of theoretical-practical contents. Exercises.	3	4
2	1	Smoothing with P-splines. Main statistics for functional data. Data registration. Practical exercises with R.	X			Revision of theoretical-practical contents. Exercises.	3	4
3	1	Functional principal component analysis. Basis expansion estimation. The Karhunen-Loève decomposition. Practical exercises with R.	X			Revision of theoretical-practical contents. Exercises.	3	4
4	1	Functional linear regression model. Estimation using basis representation. Regression on functional principal components. Practical exercises with R.	X			Revision of theoretical-practical contents. Exercises.	3	4
5	1	Functional linear regression model. Smooth estimation of the functional parameter and model interpretation. Practical exercises with R. Classification with functional data. Estimation using basis representation. Logit regression on functional principal components. Practical exercises with R.	X			Revision of theoretical-practical contents. Project development.	3	6

6	1	Classification with functional data. Smooth estimation of the functional parameter and model interpretation. Practical exercises with R.	X			Revision of theoretical-practical contents. Project development.	3	6
7	1	Presentation of final projects	X			Project development.	3	6
TOTAL HOURS							21	34