

Academic Year: (2018 / 2019)

Review date: 11-04-2018

Department assigned to the subject: Statistics Department

Coordinating teacher:

Type: Electives ECTS Credits : 6.0

Year : 4 Semester :

DESCRIPTION OF CONTENTS: PROGRAMME

1. Introduction to the functional data analysis.
2. Tools for exploring functional data:
 - a. Functional mean and variance.
 - b. Covariance and correlation functions.
 - c. Cross-covariance and cross-correlation functions.
3. From functional data to smooth functions:
 - a. Basis functions.
 - b. Smoothing functional data by least-squares.
 - c. Smoothing functional data with a roughness penalty.
4. Principal component analysis for functional data:
 - a. Defining functional PCA.
 - b. Visualizing the results.
 - c. Computational methods for functional PCA.
 - d. Regularized PCA.
5. Regression for functional data:
 - a. Functional linear models with scalar responses.
 - b. Functional linear models with functional responses.
6. Supervised classification for functional data:
 - a. k-nearest neighbors.
7. Unsupervised classification for functional data
 1. k-means.

% end-of-term-examination: 60

% of continuous assessment (assignments, laboratory, practicals...): 40