

Academic Year: (2022 / 2023)

Review date: 18-05-2022

Department assigned to the subject:

Coordinating teacher: GOMEZ VERDEJO, VANESSA

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Linear algebra.
Multivariable calculus.
Statistics.

OBJECTIVES

Basic competences

CB6 Having and understanding the knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
CB7 Students know how to apply their acquired knowledge and problem-solving skills in new or unfamiliar settings within broader (or multidisciplinary) contexts related to their field of study.
CB9 Students know how to communicate their conclusions and the knowledge and ultimate reasons behind them to specialised and non-specialised audiences in a clear and unambiguous way.

General competences

CG1 Ability to maintain continuous education after his/her graduation, enabling him/her to cope with new technologies.
CG2 Ability to apply the knowledge of skills and research methods related to engineering.
CG3 Ability to apply the knowledge of research skills and methods related to Life Sciences.
CG4 Ability to contribute to the widening of the frontiers of knowledge through an original research, part of which merits publication referenced at an international level.

Specific competences

CE1 Ability to know the peculiarities of data acquisition and information processing in the field of biomedical signals and images.
CE2 Ability to design and implement automatic learning systems for supervised and unsupervised problem solving.
CE3 Ability to design estimation and decision procedures from signals and images using statistical modeling.

DESCRIPTION OF CONTENTS: PROGRAMME

Machine Learning

Introduction to Machine learning.
Linear methods: linear and logistic regression.
Kernel methods: SVMs y GPs
Clustering: K-means and spectral clustering
Dimensionality reduction: PCA, PLS, feature selection

LEARNING ACTIVITIES AND METHODOLOGY

AF3 Theoretical practical classes
AF4 Laboratory practices
AF5 Tutorials
AF6 Team work
AF7 Student individual work
AF8 Partial and final exams

Activity code	total hours number	presencial hours number	% Student Presence
AF3	100	100	100%
AF4	32	32	100%
AF5	18	0	0%
AF6	90	0	0%
AF7	186	0	0%
AF8	12	12	100%
TOTAL SUBJECT	450	138	30,6%

ASSESSMENT SYSTEM

The assessment of the students' performance will be done continuously over the semester. The assessment will be based on the individual problem and practical projects.

SE1 Participation in class and SE2 Individual or team works made during the course 90%
SE3 Final evaluation 10%

% end-of-term-examination:	10
% of continuous assessment (assignments, laboratory, practicals...):	90

BASIC BIBLIOGRAPHY

- C. E. Rasmussen Gaussian Processes for Machine Learning, MIT Press, 2006
- C. M. Bishop Pattern Recognition and Machine Learning, Springer, 2006
- R. O. Duda, P. E. Hart, D. G. Stork Pattern Classification (2nd ed.), Wiley Interscience, 2001
- T. Hastie, R. Tibshirani, J. Friedman The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Second Edition , Springer, 2009