

Academic Year: (2022 / 2023)

Review date: 20-05-2022

Department assigned to the subject: Computer Science and Engineering Department

Coordinating teacher: ALER MUR, RICARDO

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Programming with R

OBJECTIVES

COMPETENCES THAT THE STUDENT ACQUIRES WITH THIS MATTER

CB9 That students know how to communicate their conclusions and the knowledge and ultimate reasons that sustain them to specialized and non-specialized audiences in a clear and unambiguous way

CB10 That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous.

CG4 Ability to synthesize the conclusions obtained from these analyzes and present them clearly and convincingly in a bilingual environment (Spanish and English) in writing.

CG6 Apply social skills for teamwork and to relate to others autonomously.

CE2 Use free software such as Python for the implementation of statistical analysis.

CE8 Apply and develop visualization techniques of collected samples with free distribution software such as Python.

LEARNING RESULTS THAT THE STUDENT ACQUIRES

- Integration of C ++ and R via Rcpp
- Python programming language. Machine learning packages.
- Brief introduction to the STAN programming language

DESCRIPTION OF CONTENTS: PROGRAMME

- 1) Combination of C ++ with R through Rcpp.
- 2) Python Language, numpy and pandas libraries. Graphics in Python (matplotlib and seaborn).
- 3) Machine learning packages (scikit-learn).

LEARNING ACTIVITIES AND METHODOLOGY

Theory: Lectures will be focused on teaching concepts and language elements.

Practical computer Sessions (sessions with student's own laptops): The practical classes will be developed so that, in a supervised way, students learn to solve practical cases. The practices will be carried out in groups of 2 students. There are several assignments related to topics in the course.

There will be tutorials to help the understanding both of theory and practice.

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TRAINING ACTIVITIES OF THE STUDY PLAN REFERRED TO MATTERS

AF1 Theoretical class

AF2 Practical classes

AF4 Laboratory practices

AF5 Tutorials

AF6 Group work

AF7 Individual student work

AF8 Face-to-face evaluation tests

TEACHING TRAINING METHODOLOGIES OF THE PLAN REFERRED TO MATTERS

MD1 Lectures with material and bibliography provided.

MD3 Resolution of practical cases, problems, etc.

MD5 Preparation reports individually or in groups

ASSESSMENT SYSTEM

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SE2 Individual or group work carried out during the course

SE3 Final exam

% end-of-term-examination: 30

% of continuous assessment (assignments, laboratory, practicals...): 70

BASIC BIBLIOGRAPHY

- Aurélien Géron Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems 2nd Edición, O'Reilly Media, 2019
- Dirk Eddelbuettel Seamless R and C++ Integration with Rcpp (Use R!) , Springer, 2013
- Eric Matthes Python Crash Course, 2nd Edition: A Hands-On, Project-Based Introduction to Programming, No Starch Press, 2019

ADDITIONAL BIBLIOGRAPHY

- Julian Avila scikit-learn Cookbook (2nd edition), Packt, 2017

BASIC ELECTRONIC RESOURCES

- Aurelien Géron . Github for Hands-on Machine Learning book: <https://github.com/ageron/handson-ml2>
- Eric Matthes . Resources for Python Crash Course: https://github.com/ehmatthes/pcc_2e
- Julian Avila . Scikit learn cookbook: <https://github.com/PacktPublishing/scikit-learn-Cookbook-Second-Edition>
- Python team . Official Python tutorial: <https://docs.python.org/3/tutorial/>