

Academic Year: (2022 / 2023)

Review date: 18-05-2022

Department assigned to the subject: Statistics Department

Coordinating teacher: KAISER REMIRO, REGINA

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Introduction to Programming with R (19151)

Basic Statistics (19152)

OBJECTIVES

Core Competences:

- 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
- 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.
- Students are able to integrate knowledge and to face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgments.
- 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.
- Students have the learning skills that will enable them to continue studying in a way that will be largely self-directed or autonomous.

General Competences:

- Ability to identify, define and formulate social science problems and solve them using computational techniques. This includes the ability to assess all the factors involved, not only technical but also legal.
- Ability to apply theoretical and methodological knowledge of computational social sciences to the analysis and resolution of specific cases and empirical problems.
- Ability to address issues raised under new or unfamiliar environments, within the context of computational social sciences.
- Ability to plan and carry out research in the field of computational social sciences in an autonomous way.

Specific Competences:

- Ability to understand and use the most relevant methods and techniques of statistical analysis for computational social sciences at an advanced level.

Learning Outcomes:

- Ability to test hypotheses using data and the most appropriate tools.
- Ability to estimate linear regression models with cross-sectional data, as well as to understand and explain the statistical principles underlying the estimations.
- Ability to interpret the parameters of a linear regression, obtain predictions and evaluate the goodness of fit.
- Ability to describe the logic of causal inference and its application to regression models, distinguishing between causality and correlation.
- Ability to identify common problems of causal interpretation in linear models, as well as to evaluate and justify techniques to solve them.
- Ability to evaluate the validity and robustness of causal inference under a variety of assumptions

about data generation.

- Ability to use relevant machine learning concepts and methods to formulate, structure and solve practical problems involving massive or complex data.
- Ability to apply basic machine learning models for prediction and decision making.

DESCRIPTION OF CONTENTS: PROGRAMME

1. Parametric and non parametric estimation
2. Advanced Inference
3. Introduction to advanced modelization
4. Empirical examples

LEARNING ACTIVITIES AND METHODOLOGY

Training Activities:

- Theoretical-practical classes
- Tutorials
- Group work
- Individual student work
- Partial and final examinations

Teaching Methods:

- Presentations in the professor's lecture room with computer and audiovisual support, in which the main concepts of the subject are developed and a bibliography is provided to complement the students' learning.
- Resolution of practical cases, problems, etc. raised by the professor, either individually or in a group.

ASSESSMENT SYSTEM

- Participation in the class (10%)
- Individual or group work done during the course (40%)
- Final exam (50%)

% end-of-term-examination: 50

% of continuous assessment (assignments, laboratory, practicals...): 50

BASIC BIBLIOGRAPHY

- Agresti, Alan. Statistical Methods for the Social Sciences, Global Edition., Pearson International Content., 2018
- Fogarty, Brian J. Quantitative Social Science Data with R., SAGE publications, 2018
- Privitera, Gregory J. Essential Statistics for the Behavioral Sciences., SAGE Publications, 2017