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Statistics for social sciences I

Academic Year: (2023 / 2024)   Review date: 28-03-2023

Department assigned to the subject: Statistics Department

Coordinating teacher: CABRAS , STEFANO

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Social Sciences and Law

OBJECTIVES

Specific competences:
1. Understand the basic concepts of population, sample, variable and statistic.
2. Know how to summarize a sample using measures of centre and variability.
3. Learn how to use statistical graphs to illustrate the main features of a sample.
4. Understand and implement the basic ideas of a regression analysis.
5. Learn how to estimate a population parameter based on sample data and how to formalize a hypothesis test.
6. Use of statistical software.

Transversal competences:
1. Capacity of analysis and synthesis.
2. Understanding of how to use computer packages.
3. Problem solving.
4. Teamwork.
5. Critical reasoning.
6. Verbal and written communication.

DESCRIPTION OF CONTENTS: PROGRAMME

1.   Introduction.
1.1.   Concept and uses of statistics.
1.2.   Statistical terminology.
1.3.   Typos of variables.

2.   Analysis of univariate data.
2.1.   Representations and plots of qualitative data.
2.2.   Representations and plots of quantitative data.
2.3.   Numerical summary of a sample of data.

3.   Analysis of bivariate data.
3.1.   Representations and plots of qualitative and discrete data.
3.2.   Representations and numerical summaries of quantitative data: correlation and regression.

4.   Probability and probabilistic models.
4.1.   Random experiments, sample space, elementary and composite events.
4.2.   Properties of probability.
4.3.   Conditional probability and its properties.
4.4.   Random variables and their characteristics.
4.5.   Bernoulli trials and related distributions.
4.6.   The normal distribution.

5.   Introduction to statistical inference.
5.1.   Outline and objectives.
5.2.   Point estimators.
5.3.   Interval estimators.
5.4.   Fundamentals of hypothesis testing.
5.5.   Tests for normal means.
5.6.   Tests for proportions.

LEARNING ACTIVITIES AND METHODOLOGY

Theory (4ECTS). Theory classes with materials available on the web.
Prácticas (2ECTS) Problem classes. Computing classes using statistical software.
Group tutorials for resolution of problems, doubts etc.

ASSESSMENT SYSTEM

1. Completion of two written tests with a weight of 40% of the final mark (each midterm counts for 20% of the final mark).

2. Final work in groups with a weight of 10% of the final mark (to be handed in by means of a PDF in AG indicating the names of the members of the group).

3. Continuous assessment, delivery of exercises and computer practices with a weight of 10% of the final grade (to be delivered only by AG as indicated by the teacher).

4. Final exam. An exam at the end of the course with a weight of 40% of the final grade.

5. The extraordinary exam counts for 100% of the final grade.

% end-of-term-examination: 40

% of continuous assessment (assigments, laboratory, practicals…):   60

BASIC BIBLIOGRAPHY

- D. Huff How to Lie with Statistics, W.W. Norton & Company.

- Remenyi, D. et al. An introduction to statistics using Microsoft Excel , Academic Publishing, 2010

ADDITIONAL BIBLIOGRAPHY

- D. Rowntree Statistics without Tears, Penguin Books.