Quantitative social research methods II

Academic Year: (2019 / 2020) **Review date: 30-04-2020**

Department assigned to the subject: Social Sciences Department

Coordinating teacher: TORRE FERNANDEZ, MARGARITA

Type: Electives ECTS Credits : 6.0

Year : 5 Semester :

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Quantitative Social Research Methods I, Statistics I, Statistics II.

OBJECTIVES

At the end of the course, students must be proficient in the following tasks:
1. Analyzing the different techniques, as well as their relevance and limitations when solving problems of a contrasting nature.
2. Applying advanced techniques with rigor and sophistication for data analysis.
3. Interpreting the analyses and identifying the most relevant results.
4. Reporting the results correctly (good design of tables, graphs, etc.).

In addition, the student must have:
5. Advanced knowledge of the statistical package Stata/R

DESCRIPTION OF CONTENTS: PROGRAMME

Quantitative research techniques are a key element in the training of future professionals, who will need to obtain, manage, and analyze data in their respective careers.

This course delves into the learning of quantitative social research techniques from an applied perspective. All topics will be approached in a theoretical/practical way, using the statistical package Stata/R.
The course is structured in 3 large blocks, each composed of different themes:

1. Inferential exploratory techniques:
1.1. Factor Analysis: This is a technique to reduce the dimensionality of data, and aims to find a minimum of dimensions with which to explain as much information as possible.
1.2. Cluster Analysis: This is a multivariate statistical technique that groups elements to achieve maximum homogeneity in each group, with the largest difference being between groups. In the course, we address two clustering strategies:
1.2.1. Clustering using partitioning algorithms.
1.2.2. Clustering using hierarchical algorithms.

2. Advanced Multivariate statistical techniques:
2.1. Logistic regression: This is a multivariate research technique, in which the main objective is to model how certain variables influence the probability of the occurrence of an event (dichotomous dependent variable).
2.2. Multinomial logistic regression: This is an extension of logistic regression for cases where the dependent variable is of a polytomous nature.
2.3. Introduction to Multilevel Analysis: Multilevel models are an extension of classical linear regression models, suitable for processing hierarchical data.
2.4. Introduction to time series: A time series is a sequence of observations ordered in time or space.

3. Treatment of Lost Cases
In this part of the course, we will address alternative strategies for the treatment of missing data:
3.1. Simple methods: deletion methods, single imputation.
3.1. Multiple Imputation Methods.

LEARNING ACTIVITIES AND METHODOLOGY

Master Classes (3 ECTS credits):
Lecture on the theoretical content of the subject.

Reduce Classes (3 ECTS credits):
Practical classes in the computer room using Stata/R.

ASSESSMENT SYSTEM

- Midterm exam, participation in debates and other activities.

- Final exam: includes both theory and practice content.

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- Cameron, Colin A. & Pravin K. Trivedi Microeconometrics using STATA, Stata Press, 2010

- James, Gareth, Daniel Witten, Trevor Hastie, & Robert Tibshirani An introduction to Statistical Learning with applications in R, Springer, 2013

- Long, Scott J. & Jeremy Freese Regression Models for Categorical Dependent Variables Using Stata, Stata Press, 2014

- Peña, Daniel, Tiao, George C., & Ruey S. Tsay A Course in Time Series Analysis, Ed. John Wiley, 2015

ADDITIONAL BIBLIOGRAPHY

- Muenchen, Robert A. & Joseph Hilbe R for Stata Users, Springer, 2010

- Wickham, Hadley & Garret Grolemund R for Data Science. Import, tidy, transform, visualize, and model data, O'Reilly, 2016