

Academic Year/course: 2021/22

61343 - Multivariate Analysis Techniques

Syllabus Information

Academic Year: 2021/22

Subject: 61343 - Técnicas de análisis multivariante

Faculty / School: 109 - Facultad de Economía y Empresa

Degree: 525 - Master's in Economics

ECTS: 3.0

Year: 1

Semester: Second semester

Subject Type: Optional

Module:

1. General information

1.1. Aims of the course

The approach of the subject is markedly instrumental since its objective is to provide students with a set of statistical tools widely used in the realization of a multidimensional exploratory analysis. To this end, the course begins with a theme dedicated to univariate exploratory analysis aimed, on the one hand, present the technics of one-dimensional statistical analysis commonly used in carrying out an initial analysis of data and, on the other, familiarizing the student with the statistical tool to be used throughout the course. Later two themes dedicated to the process of data reduction will be studied: the principal component analysis and factor analysis whose purpose is to express the information in a set of multivariate data in a small number of variables so that information loss is minimal and adequately reflects the relationship between the variables analyzed, all of which make such information more understandable. Finally, the problem of classification of objects will be studied from an exploratory character in which various techniques unsupervised classification included in cluster analysis will be presented.

1.2. Context and importance of this course in the degree

To pass the course, the student will be competent to use statistical tools to extract relevant information to develop and defend projects applied of economic character.

1.3. Recommendations to take this course

To have completed a course of introduction to both descriptive and inferential statistics and a course of Introduction to Econometrics

2. Learning goals

2.1. Competences

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2.2. Learning goals

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2.3. Importance of learning goals

Statistical techniques studied in the course will equip students with a set of powerful tools to make an initial

exploratory analysis of the information contained in economic databases. In this way the student will learn to provide scientific rigor to solving economic problems by analyzing empirical data, which is an important step in implementing the scientific approach to problem solving.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate that it has achieved the intended learning outcomes by performing two tests of empirical character in which he will apply some of the techniques learned in the course. Both tests will aim to explain a set of real data using the techniques and methods developed in class and get the relevant conclusions. Both tests have the same weight in the final mark, i.e., 50%.

Course assessment will be onsite. In the case of a new pandemic wave assessment will become partly online or fully online. It should be noted that in any online assessment task the student performance may be recorded, following the regulations described in: https://protecciondatos.unizar.es/sites/protecciondatos.unizar.es/files/users/lopd/gdocencia_reducida.pdf?_

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process is based on the combination of exposure, by the teacher, of the underlying theoretical basis to each of the techniques explained, with application to case studies conducted in the classroom using the SPSS 22.0 statistical package and R program. This will be done in a participatory environment in which both teacher and students discuss among themselves the interpretation of the results, which will increase the degree of applicability of the explained techniques.

All lectures and seminars will be imparted on site. In the case of a new health emergency caused by the current pandemic all teaching will be moved online.

4.2. Learning tasks

Theoretical and practical sessions (50%-50%)	30	100%
Work preparation and independent study	60	-----

4.3. Syllabus

Theme 0A: Panoramic view of multivariate analysis (2 hours)

Theme 0B: Introduction to SPSS (2 hours)

Theme 0C: Introduction to R (4 hours)

Theme 1: Initial Data Analysis (8 hours)

Theme 2: Factor Analysis (Principal Component Analysis) (8 hours)

Theme 3: Cluster Analysis (6 hours)

The course will be taught in sessions of two hours in the computer room.

4.4. Course planning and calendar

Presentation: In the first session of the course, the objectives and contents of the subject are explained in detail, the teaching methodology used in the classes is presented and the evaluation criteria are clearly exposed. Likewise, an overview of multivariate statistical techniques will be given.

Theoretical-practical sessions: Throughout the course, 15 theoretical-practical sessions will be held in a computer room in which the theoretical bases of the statistical techniques will be explained and then these techniques will be illustrated by means of the analysis of real cases related to the world of economics. For this, the R program will be used as tool.

Autonomous work: To pass the course, the student must submit varied exercises for each of the topics.

4.5. Bibliography and recommended resources

The updated bibliography is incorporated through the Library Center and can be accessed by the web