Data analytical techniques for business

Academic Year: (2023 / 2024)   **Review date: 19-05-2023**

Department assigned to the subject: Statistics Department

Coordinating teacher: VELILLA CERDAN, SANTIAGO

Type: Compulsory ECTS Credits : 6.0

Year : 4 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Sequences:

Statistics I-II
Mathematics for Economics I-II

Some familiarity with Microsoft Excel is also advisable.

OBJECTIVES

Advanced techniques of MIcrosoft Excel with applications in Business Analytics

DESCRIPTION OF CONTENTS: PROGRAMME

The purpose of the course is to present an advanced revision of Business Anaytics techniques, based on the intensive use of Microsoft Excel

1. Introduction to BUSINESS ANALYTICS

** 1.1 Examples of Business Data
** 1.2 Numerical and graphical tasks
** 1.3 Business Analytics and Microsoft Excel

2. FUNDAMENTALS of Software

** 2.1 Introduction to Excel
** 2.2 Keyboard shortcuts and screen operators
** 2.3 Ranges in Excel
** 2.4 Excel functions and expressions
** 2.5 Tables and Pivot Tables
** 2.6 Filtering and Sorting
** 2.7 Charts with Excel
** 2.8 Dashboards
** 2.9 Conditional formatting
** 2.10 Importing text data into Excel
** 2.11 Importing data from the Internet
** 2.12 Matrices with Excel
** 2.13 Excel Add-Ins
** 2.14 Printing an Excel Workbook

3. REVIEW of elements of Statistics

** 3.1 Excel functions for exploratory data analysis
** 3.2 Stacked and unstacked data layouts
** 3.3 Histograms and Box-Plots with Excel
** 3.4.Multidimensional data
** 3.5 The data matrix
** 3.6 Different types of data
** 3.7 Mean vector. Covariance and correlation matrices
** 3.8 Centering and standardizing
** 3.9 Data reduction

** 3.10 The normal distribution. Distribution tables. Applications with Excel

4. SIMULATION techniques.

** 4.1 Basic simulation methods with Excel
** 4.2 Generation of univariate and multivariate normal data with Excel
** 4.3 Applications and examples with Excel

5. CASE analysis

** 5.1 Examples of real data applications in Business, Economics, Finance, and Marketing with Excel.

LEARNING ACTIVITIES AND METHODOLOGY

Competences will be acquired by students from:

[I] Theory classes: one per week (14 sessions) [eventually online synchronous]

[II] Practical classes: one per week (14 sessions) [face-to-face]

Activities [I] and [II] will be devoted to exercises, problems, data examples, and case studies. Teaching will make intensive use of the resources available in Aula Global. In face-to-face sessions, the program is Microsoft Excel 2021 for Windows or Microsoft Excel 365. The University makes the latter available to the students for free. Online sessions will be recorded.

ASSESSMENT SYSTEM

Continuous evaluation: 50%

This will consist in he completion of some software practices, with a collection of computer and data analysis activities (50%).

Final exam: 50%

Further details can be however discussed at the beginning and end of the course, in order to reach a common agreement between instructor and students.

Attendance to class will be taken into account in the grading process

Extraordinary exam will follow the usual rules of Universidad Carlos III de Madrid. The student can choose between a 100% grade based on a final exam, or, if that is the case, the combination of the continuous assessment with a final exam in the same conditions than the regular exam.

% end-of-term-examination:	50
% of continuous assessment (assigments, laboratory, practicals…):	50

BASIC BIBLIOGRAPHY

 - ALBRIGHT, S. C. and WINSTON, W. L. Business Analytics: Data Analysis and Decision Making, 7th Edition, Cengage Learning, 2019
 - WINSTON, W. L. Microsoft Excel Data Analysis and Business Modeling (Office 2021 and Microsoft 365), Microsoft Press, 2021

ADDITIONAL BIBLIOGRAPHY

 - ANDERSON, D. R., SWEENEY, D. J. and WILLIAMS, T. A.   Modern Business Statistics with Microsoft Excel, 7th Edition, Cengage Learning, 2021
 - JELEN, B. Microsoft Excel Pivot Table Data Crunching (Office 2021 and Microsoft 365), Microsoft Press, 2021