Course Unit	Quantitative Methods for Business-	Field of study	Management
Bachelor in	Management	School	School of Technology and Management
Academic Year	2022/2023	Year of study	3
Level	1-3	ECTS credits	6.0
Type	Semestral	Semester	1
Code	9147-707-3103-00-22		

Workload (hours)	Contact hours	T	TP	PL	TC	S	E	OT	O
162		-	54	-	-	-	-	6	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Maria Prudência Gonçalves Martins, Nuno Filipe Lopes Moutinho

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Conduct data analysis relevant for the management of organizations and to foresee economic and entrepreneurial phenomena with consequences in the management process;
2. Present the findings of the data analysis and apply them in the areas of finance, marketing and production management;
3. Use the proper software to apply statistical/econometric methods to real data and conduct empirical work to support decision making in the management and evaluating the results critically.

Prerequisites

Before the course unit the learner is expected to be able to:
1. Apply basic concepts of quantitative methods and statistics;
2. Use knowledge of informatics and operate computer programs (software).

Course contents

Statistical inference and non parametric tests. Forecasting methods. Simple and multiple regression. Estimation of models with discrete choices.

Course contents (extended version)

1. Statistical inference and non parametric tests
   - Concepts recap: confidence intervals, hypothesis tests, p-values, types I and II statistical errors
   - Inference on quantitative data: t test, Sign and Wilcoxon tests, independent or paired
   - Inference on qualitative data: Chi-squared test for 1 sample and for contingency tables
2. Forecasting methods
   - Terminology and basic tools for analyzing time series and forecasting methods
   - Time series decomposition
   - Exponential smoothing techniques
   - Introduction to state space models for computing forecasting intervals
3. Simple and multiple regression
   - Models' classical hypothesis
   - Ordinary Least Squares (OLS) estimators and properties
   - Adjustment precision indicators
   - Extensions: Functional forms, dummy and lag variables
   - Classical hypothesis violations: multicollinearity heteroscedasticity, autocorrelated disturbances
4. Estimation of models with discrete choices
   - Logit model: estimation and inference
   - Probit model: estimation and inference

Recommended reading

1. Diez D., Cetinkaya-Rundel, M. & Barr C. (2019). OpenIntro Statistics (www. openintro. org).
2. Hyndman, R. J. & Athanasopoulos, G. (2021). Forecasting: Principles and Practice (https://otexts.com/fpp3/).
3. Greene, W. (2023). Econometric Analysis (8th Ed.) Pearson Education.
4. Stock, J. (2019). Introduction to Econometrics (4th Ed.) Pearson Education.
5. Gujarati D., Provost F. & Fawcett T. (2013). Data Science for Business. O'Reilly Media.

Teaching and learning methods

In class there will be a presentation and description of contents and analysis and resolution of small application examples accompanied by practical exercises conducted using statistical/econometric software. During the contact period the students must review the materials taught and solve application exercises and elaborate practical reports that include empirical applications of real problems.

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final, Supplementary)
   - Practical Work - 60% (2 pratical works (30% each))
   - Final Written Exam - 40%
2. Alternative 1 - (Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100%
3. Alternative 3 - (Regular) (Special)
   - Final Written Exam - 100%

Language of instruction

1. Portuguese
2. Portuguese, with additional English support for foreign students.

Electronic validation

Maria Prudência Gonçalves Martins, Nuno Filipe Lopes Moutinho	Paula Odete Fernandes	António Jorge da Silva Trindade Duarte	António Borges Fernandes	Paulo Alexandre Vara Alves
19-10-2022	20-10-2022	20-10-2022	28-10-2022	29-10-2022