

Course Unit	Quantitative Methods for Business		Field of study	Management	
Bachelor in	Management		School	School of Technology and Management	
Academic Year	2021/2022	Year of study	3	Level	1-3
Type	Semestral	Semester	1	ECTS credits	6.0
Code	9991-708-3103-00-21				
Workload (hours)	162	Contact hours	T -	TP 54	PL -
			TC -	S -	E -
			OT 6	O -	

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) Carla Sofia Renca da Cruz, 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. Guimarães, R. C., & Sarsfield C. J. (2010). Estatística. Verlag Dashofer.
2. Hyndman, R. J., & Athanasopoulos, G. (2018). Forecasting: Principles and Practice. <http://otexts.org/fpp/>
3. Ferreira, P. J. (2016). Princípios de Econometria (2.ª Ed.). Rei dos Livros.
4. Ferreira, P. J. (2014). Exercícios de Econometria. Rei dos Livros.
5. Gujarati, D., & Porter, D. (2010). Basic Econometrics (5th Ed.). McGraw-Hill/Irwin.

### 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 - 50% (Class assignments (20%)
  - 1 practical work (30%))
  - Final Written Exam - 50% (Written exam (Chapters 1 e 2) - 30%
  - Written exam (Chapters 3 e 4) - 20%)
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

Carla Sofia Renca da Cruz, Nuno Filipe Lopes Moutinho	Paula Odete Fernandes	António Jorge da Silva Trindade Duarte	António Borges Fernandes	Paulo Alexandre Vara Alves
29-10-2021	07-11-2021	08-11-2021	12-11-2021	15-11-2021