INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Data Analysis			Field of study	Statistics										
Bachelor in	Marketing			School	School of Public Management, Communication and Tourism										
Academic Year	2022/2023	Year of study	2	Level	1-2	ECTS credits	6.0								
Type	Semestral	Semester	2	Code	9205-714-2201-00-22										
Workload (hours)	162	Contact hours	T -	TP 60	PL -	TC -	S -	E -	OT -	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): Maria de la Salete Dias Esteves

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Characterize consumers and their behavior, using models of variance, regression.
2. Establish differences in behaviors / variables based on variance models.
3. Establish relationships between variables based on regression models.
4. Analyze and characterize time series applied to marketing problems.
5. Obtain information from the data in order to reduce uncertainty in the analysis of marketing problems and facilitate decision making.
6. Develop demand forecasts.
7. Measure the quality of forecasting methods.
8. Select the most appropriate forecasting method in accordance with data.

Prerequisites

Before the course unit the learner is expected to be able to:
have knowledge in statistics.

Course contents

Hypothesis testing; Non-parametric Tests; Analysis of Variance; Regression and Correlation Analysis; Multiple Regression and correlation; Time Series Analysis and forescating; Measures of the forecast.

Course contents (extended version)

1. Testing Hypotheses
   - State the null and alternative hypotheses
   - Choosing the test of significance and calculate the sample score
   - Establish the critical score and critical region and make a decision
   - Type I and type II erros in hypotheses testing
   - Comparing distributions
   - Testing Hypotheses using Jamovi
2. Non-parametric Tests
   - Goodness of fit test
   - The Wilcoxon signed-ranks z-test.
   - The chi-square test for Independence
   - Non-parametric Tests using Jamovi
3. Analysis of Variance
   - One-way and two-way ANOVA
   - Validity of the models
   - Analysis of Variance using Jamovi
4. Regression and Correlation Analysis
   - Assumptions associated with simple linear regression analysis
   - Determining the linear regression equation of the basis of simple data
   - Assumptions associated with correlation analysis
5. Multiple Regression and correlation
   - Exploration of the data
   - Estimation and forecasting
   - Assumptions of multiple linear regression mode
6. Time Series Analysis and forescating
   - Objectives of the study of time series
   - Overview of forecasting methods
   - Averaging and exponential smoothing models
   - Models of decomposition with seasonal component
   - Time Series Analysis and forescating with Microsoft Excel
7. Measures of the forecast
   - Mean Absolute Deviation
   - Mean Forecast Error
   - Mean Absolute Percentage Error
   - Tracking Signal

Recommended reading

1. Castejón, P. J. M., Lechuga, M. L., & Martínez, Ú. F. (2015). Guía práctica de Estadística aplicada a la empresa y al marketing. Paraninfo-Universidad. ISBN:9788428337489.
2. Figueiredo, F. , Figueiredo, A. , Ramos, A. & Teles, P. (2017). Inferência Estatística. Escolar Editora. ISBN: 9789725925010.
3. Gageiro, J. N. & Pestana, M. H. (2014). Análise de dados para ciências sociais (6ª ED). Edições Sílabo. ISBN: 9789726187752.
4. Laureano, R. (2020). Testes de Hipóteses e Regressão. Edições Sílabo. ISBN: 9789895610518.
5. Oliveira, J. (2014). Marketing Research - Volume I. Edições Sílabo. ISBN: 9789726186748.

Teaching and learning methods

For each theme, work modules with an explanation of the contents and exercises to be resolved with or without oriented solution, will be proposed. The subject's content will be exposed using audiovisual resources and, when possible, with the use of real cases. The classes will be oriented to overcome work difficulties and will be supported by appropriate informatics resources

Assessment methods

1. Distributed Evaluation I - (Regular, Student Worker) (Final, Supplementary)
   - Practical Work - 40%
   - Intermediate Written Test - 30%
   - Final Written Exam - 30% (minimum grade: 7 points)
2. Distributed Evaluation II - (Regular, Student Worker) (Supplementary, Special)
   - Practical Work - 40%
   - Final Written Exam - 60%
3. Evaluation by final exam - (Regular, Student Worker) (Supplementary, Special)
   - Final Written Exam - 100%
4. Exchange students - (Regular, Student Worker) (Final, Supplementary, Special)
   - Practical Work - 50%
   - Final Written Exam - 50%

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

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26-02-2023	11-03-2023	13-03-2023	13-03-2023