

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Course	Data Science and Artificial Intelligence					
Subject	Data Exploratory Analysis					
Academic year	2023/2024	Curricular year	1	Study period	1	
Type of subject	Mandatory	Student workload (H)	Total: 168	Contact: 60	ECTS	6
Professor(s)	Manuela Figueira Neves					
☒ Area/Group Coordinator ☐ Head of Department		José Miguel Rodrigues Teixeira Salgado				

PLANNED SD

1. LEARNING OBJECTIVES

- To understand the concepts and basic principles of statistics and probabilities;
- To understand the methods and techniques of data analysis;
- To apply and resume the concepts and techniques worked out in classes;

2. PROGRAMME

Chapter 1 – Introduction to Statistics

Concepts and basic principles of statistics: population and samples.

Descriptive and Inductive statistics

Data classification

Formal methods of sampling

Frequency distribution: tables and graphical representations

Bidimensional distributions

Chapter 2 – Central tendency measures

Mean, Median and Mode

Chapter 3 – Dispersion, asymmetry, kurtosis and concentration measures

Chapter 4 – Regression and Correlation

Linear models

Chapter 5 – Introduction to Probabilities

General concepts: random experiments, deterministic experiments, sample space and events

Law of large numbers

Frequencist definition of probability

Classical definition of probability: Laplace law

Probability axioms

Properties of probabilities

Conditional probabilities

Independence of events

Calculus of probabilities

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3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

<i>Objective</i>	<i>Content</i>
To understand the concepts and basic principles of statistics and probabilities;	<i>Chapter 1 to 5</i>
To understand the methods and techniques of data analysis;	<i>Chapter 1 to 5</i>
To apply and resume the concepts and techniques worked out in classes;	<i>Chapter 1 to 5</i>

4. MAIN BIBLIOGRAPHY

Mandatory:

- [1] Martins, M; Louro, Luísa; Mendes, Maria (2007) *Análise de Dados*. Direcção Geral de Inovação e Desenvolvimento Curricular, Ministério da Educação.
- [2] Neves, M. (1999). "Probabilidade" Parte 1. Porto Editora
- [3] Neves, M. (1999). "Estatística" Parte 3. Porto Editora
- [4] Palhares, P. (2004). *Elementos de Matemática para professores do ensino básico*. Lisboa: LIDEL
- [5] Pedrosa, A.C e Gama, S. M. A. (2004). *Introdução Computacional à Probabilidade e Estatística*. Porto Editora

Suggested:

- [6] Neves, Manuela Figueira (2023). "Caderno de Exercícios de Análise Exploratória de Dados", material didático para a UC de Análise Exploratória de Dados, ESTG/IPG.
- [7] Guimarães, R. e Cabral, J. (1997). *Estatística*. Lisboa: McGraw-Hill
- [8] Fonseca, J. e Torres, D. (2000). "Exercícios de Estatística". Edições Sílabo.
- [9] Murteira, J. F. B.; Ribeiro, C. S.; Silva, J. A.; Pimenta, C. (2002). *Introdução à Estatística*. Lisboa: McGraw-Hill
- [10] Pestana, D. e Velosa, S. F. (2008). *Introdução à probabilidade e à estatística*. Fundação Calouste Gulbenkian
- [11] Robalo, A. (1994) "Estatística - exercícios" vol. 1 e vol. 2: Edições Sílabo
- [12] Reis, E; Melo, P.; Andrade, R. e Calapez, T. (1999) "Estatística Aplicada" vol. 1. Edições Sílabo

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

There are two evaluation methods: continuous evaluation and final exam evaluation

Continuous evaluation: two written tests (100%) with a minimum score each of 5/20.
 Student will be approved if: final classification ≥ 10 ;

Exam:

Not approved students in the continuous evaluation can submit to the normal exam or recourse exam.
 The student will be approved if is classification is higher or equal to 10.

Students obtaining a final classification higher than 16 must submit to an oral exam, otherwise they will stay with the final classification of 16.

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6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

<i>Objective</i>	<i>Content</i>
- To understand the concepts and basic principles of statistics and probabilities;	<i>Evaluation preparation and execution</i>
- To understand the methods and techniques of data analysis;	<i>Evaluation preparation and execution</i>
- To apply and resume the concepts and techniques worked out in classes;	<i>Evaluation preparation and execution</i>

7. ATTENDANCE

Not Applicable

8. CONTACTS AND OFFICE HOURS

Maria Manuela Caria Figueira de Sá Neves, mfigueira@ipg.pt, Office 44; Ext: 1244

Office hours: Monday – 9:00 to 12:30

Friday – 9:00 to 11:00

Evaluation date: 1st test: 03/11/2023 – cap. 1 to cap. 3

DATE

18/09/2023

SIGNATURES

Professor(s), Area/Group Coordinator or Head of Department signatures

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