UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Probabilities and Statistics

Academic Year 2025/2026

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

Computer Engineering

3. Cycle

1st

4. Course Unit

Probabilities and Statistics (L9016)

5. Scientific Area

6. Curricular Year

2nd

7. Type of Curricular Unit / Semester

2nd Semester

FUNDAÇÃO MINERVA CULTURA - ENSINO E INVESTIGAÇÃO CIENTÍFICA

Rua da Junqueira, 188 a 198 - 1349-001 LISBOA - Telefone 213 611 500 - Fax 213 638 307 - e-mail: info@lis.ulusiada.pt - https://www.lis.ulusiada.pt

8. Class type and workload (work time)

Theoretical classes:	
Practical classes:	
Theoretical-Practical Classes	30,00
Tutorial Guidance:	20,00

9. ECTS Credits

6,00

10. Scientific Area Coordinator

11. Regent

Prof. Doutor FERNANDO MANUEL MONTEIRO MARTINS

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

Apply statistical analysis techniques in solving concrete problems in the fields of Economics and Management.
Present the basic methods of statistical analysis, focusing on the close connection between sample and population.

15. Specific Objectives

Understand the importance of Statistics as a science that allows comparing sample data with theory (sets of abstract hypotheses about population parameters). Probability Theory, the branch of Mathematics that allows describing and understanding random experiences, is the indispensable tool for measuring and controlling the uncertainties inherent in statistical reasoning. Inferential analysis presents a set of techniques that allow extrapolating the sample results to the population.

16. Skills to be acquired

Understand the fundamental principles of probability theory and statistics.
Apply statistical methods to solve concrete problems in engineering and management contexts.
Calculate and interpret probabilities, distributions, and estimators.
Formulate and test statistical hypotheses based on sample data.
Use statistical software (R and SPSS) for data analysis.
Assess the reliability and scope of conclusions obtained using probabilistic methods.

FUNDAÇÃO MINERVA CULTURA - ENSINO E INVESTIGAÇÃO CIENTÍFICA

Rua da Junqueira, 188 a 198 - 1349-001 LISBOA - Telefone 213 611 500 - Fax 213 638 307 - e-mail: info@lis.ulusiada.pt - https://www.lis.ulusiada.pt

17. Teaching Methodology

Teaching is centered on solving applications, that is, on developing problem-solving skills in economic and social sciences through a systematic resolution methodology. It is essential that students can reach a good level of understanding of statistical methods and the respective ability to apply them in concrete problems in the fields of Economics or Management.

18. Course Unit Program

1. PROBABILITY THEORY.
1.1. Concepts, algebra of events, axioms.
1.2. Conditional odds. Independence of events.
1.3. Total Probability Theorem and Bayes' Theorem.

2. RANDOM VARIABLES.
2.1. Concept.
2.2. One-dimensional VA probability and distribution functions.
2.3. Two-dimensional VA probability and distribution functions.
2.4. Parameters.

3. DISTRIBUTIONS OF DISCRETE AND CONTINUOUS RANDOM VARIABLES.
3.1. Uniform distribution.
3.2. Bernoulli distribution.
3.3. Binomial Distribution.
3.4. Poisson distribution;
3.5. Normal Distribution.

4. SAMPLING DISTRIBUTIONS.
4.1. Normal Distribution, Chi-Square, t-Student and F-Snedecor.
4.2. Sampling distributions of the most important statistics: Bernoulli populations and Normal populations.

5. INTRODUCTION TO STATISTICAL INFERENCE.
5.1. Point estimation.
5.2. Interval estimation: core variable method.

6. HYPOTHESES TESTS.
6.1. Formulation of hypotheses.
6.2. Errors and probabilities.
6.3. Power function.
6.4. Parametric hypothesis tests.

19. Assessment Methods

Access to continuous evaluation depends on attending at least 70% of the classes taught (applies to both TP and OT classes). The process consists of carrying out two mandatory interim tests, with a weighting of 50% each.

FUNDAÇÃO MINERVA CULTURA - ENSINO E INVESTIGAÇÃO CIENTÍFICA

Rua da Junqueira, 188 a 198 - 1349-001 LISBOA - Telefone 213 611 500 - Fax 213 638 307 - e-mail: info@lis.ulusiada.pt - https://www.lis.ulusiada.pt

20. Didactic Resources

Rooms equipped with computers with internet access, and with statistical software (R or SPSS), available for students who wish to further develop their knowledge of the subject.

21. Sustainability Objectives

SDG 4 Quality education: development of quantitative and analytical skills in applied statistics.
SDG 8 Decent work and economic growth: use of statistics as a tool to support decision-making and productivity.
SDG 9 Industry, innovation and infrastructure: application of statistical methods to innovation and improvement of business processes.
4 -Understand to what extent Statistics can be an important means of assessing the impact of climate change.

22. Keywords

Probabilities
Random variable
Probability distributions
Sample
Estimation
Inference tests

FUNDAÇÃO MINERVA CULTURA - ENSINO E INVESTIGAÇÃO CIENTÍFICA

Rua da Junqueira, 188 a 198 - 1349-001 LISBOA - Telefone 213 611 500 - Fax 213 638 307 - e-mail: info@lis.ulusiada.pt - https://www.lis.ulusiada.pt

23. Main Bibliography

Author(s): Murteira, B., C.S. Ribeiro, J. Andrade e Silva, C. Pimenta & F. Pimenta
Title: Introdução à Estatística
Edition: 3ª Year: 2015
Local: Lisboa
Publisher: Escolar Editora
ISBN Code:

Author(s): Heiss, Florian
Title: Using R for Introductory Econometrics
Edition: 2ª Year: 2020
Local: Düsseldorf, Germany
Publisher: Independently published
ISBN Code:

Author(s): Reis, E., P. Melo, R. Andrade & T. Calapez
Title: Estatística Aplicada (Vol. 2)
Edition: 5ª Year: 2016
Local: Lisboa
Publisher: Sílabo
ISBN Code:

24. Complementary Bibliography

Author(s): Afonso, A. & Nunes, C.
Title: Probabilidades e Estatística - Aplicações e Soluções em SPSS
Edition: Year: 2019
Local:
Publisher: Universidade de Évora
ISBN Code:

Author(s): Nunes, C. F.
Title: Probabilidades e Estatística - 275 problemas resolvidos (utilização do R)
Edition: Year: 2012
Local: Lisboa
Publisher: Escolar Editora
ISBN Code:

FUNDAÇÃO MINERVA CULTURA - ENSINO E INVESTIGAÇÃO CIENTÍFICA

Rua da Junqueira, 188 a 198 - 1349-001 LISBOA - Telefone 213 611 500 - Fax 213 638 307 - e-mail: info@lis.ulusiada.pt - https://www.lis.ulusiada.pt

UNIVERSIDADE LUSÍADA
LISBOA

Ficha técnica MIP / MIP Datasheet	
Título / Title	Course Unit Program 'PROBABILIDADES E ESTATÍSTICA': Academic Year 2025/2026
Autor / Author	Prof. Doutor FERNANDO MANUEL MONTEIRO MARTINS
Classificação / Classification	-
Descritores / Descriptors	-
Colaborador(es) / Colaborator(s)	-
Data Hora / Date Time	
Formato de dados / Data Format	Texto / Text, PDF
Estatuto de utilização / Usage	Acesso público / Public Access
Relação / Relation	Version 1,0

(c) Universidade Lusíada, 2025

FUNDAÇÃO MINERVA CULTURA - ENSINO E INVESTIGAÇÃO CIENTÍFICA

Rua da Junqueira, 188 a 198 - 1349-001 LISBOA - Telefone 213 611 500 - Fax 213 638 307 - e-mail: info@lis.ulusiada.pt - https://www.lis.ulusiada.pt