UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Mathematics

Academic Year 2025/2026

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

ECONOMICS

3. Cycle

1st

4. Course Unit

Mathematics (03302)

5. Scientific Area

6. Curricular Year

1st

7. Type of Curricular Unit / Semester

1st Semester

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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 ALEXANDRE MANUEL MORAIS MENA E SILVA

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

To introduce the main mathematical tools, fundamental to the comprehension of several subjects in economy and management area.

15. Specific Objectives

Familiarize students with the fundamental concepts of Matrix Calculus. Review the study of Differential Calculus in ℝ.

16. Skills to be acquired

Students should acquire the following skills:
Operate with matrices;
Calculate the determinant of a matrix using the Gaussian method;
Apply the Gaussian method to solve systems of linear equations;
Study functions of a single variable and solve optimization problems.

17. Teaching Methodology

The curse is organised in theoretical/practical sessions (with presentation of main concepts and properties) supported by tutorial sessions where examples of application will be presented.

18. Course Unit Program

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1. Matrix Calculus
1.1. Systems of linear equations. Gauss method.
1.2. Determinants. Calculation of determinants by the Gauss method and by the Laplace method.
1.3. Operations with matrices: addition, multiplication by a real number and multiplication.
1.4. Inverse matrix and resolution of matrix equations.
2. Differential calculus complements in R
2.1. Generalities about real functions of real variable.
2.2. The concept of derivative
2.3. Application of derivatives to the study of functions. Optimisation issues.
2.4. Cauchy's rule.

19. Assessment Methods

The continuous assessment component consists of two points written during the semester

20. Didactic Resources

bibliographic indications and a theoretical-practical workbook available on Moodle.

21. Sustainability Objectives

SDG 4. Quality Education. Develop skills in logical reasoning, inductive and deductive reasoning. Modeling and problem solving.
SDG 8. Decent Work and Economic Growth. Improve employability through mathematical skills and analytical skills.
SDG 9. Industry, Innovation and Infrastructure. Apply mathematics to innovation and technological development.

22. Keywords

Matrices
Determinant
Derivative
Optimisation

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23. Main Bibliography

Author(s):	António Monteiro		
Title:	Álgebra Linear e Geometria Analítica		
Edition:	1ª	Year:	2001
Local:	Lisboa		
Publisher:	Ed MacGraw-Hill		

Author(s):	António Monteiro		
Title:	Matrizes		
Edition:	1ª	Year:	2016
Local:	Lisboa		
Publisher:	Dashöfer		

Author(s):	J. Campos Ferreira		
Title:	Introdução à Análise Matemática		
Edition:	11ª	Year:	2014
Local:	Lisboa		
Publisher:	Fundação Calouste Gulbenkian		

24. Complementary Bibliography

Author(s):	Ron Larson, Robert P. Hostetler, & Bruce H. Edwards		
Title:	Cálculo		
Edition:	1ª	Year:	2006
Local:	São Paulo, Brasil		
Publisher:	MacGraw-Hill Interamericana do Brasil		

Author(s):	Earl W. Swokowski		
Title:	Cálculo com Geometria Analítica		
Edition:	1ª	Year:	1995
Local:	São Paulo, Brasil		
Publisher:	Makron Books		

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Ficha técnica MIP / MIP Datasheet	
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Autor / Author	Prof. Doutor ALEXANDRE MANUEL MORAIS MENA E SILVA
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