



UNIVERSIDADE LUSÍADA  
LISBOA

Course Unit Program  
Mathematics

Academic Year 2023/2024

**1. Organic Unit**

Faculty of Business and Economic Sciences

**2. Course**

Sport Organization Management

**3. Cycle**

1st

**4. Course Unit**

Mathematics (C1101)

**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

Dr. JOSÉ MANUEL SILVA GUERREIRO LOUÇÃO DE MATOS

#### 12. Assistants

#### 13. Teaching Language

Portuguese

#### 14. General Objectives

Provide students with the basic instruments of the area of Mathematics for use in specific curricular units of the area of Management and Economics.

#### 15. Specific Objectives

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

#### 16. Skills to be acquired

Resolution and discussion of systems of equations, by Gauss's method. Operations with matrices. Troubleshooting optimization problems with functions of a variable.

#### 17. Teaching Methodology

The subject will be presented in theoretical-practical classes, supported by tutorial orientation sessions where examples of application of the given subject will be presented.

#### 18. Course Unit Program



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1. Matrix Calculus
  - 1.1. Systems of linear equations. Gauss's method.
  - 1.2. Determinants. Calculation of determinants by Gauss's method and Laplace's 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 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. Optimization problems.
  - 2.4. Cauchy's rule.

## 19. Assessment Methods

There will be two continuous assessment tests throughout the semester.

## 20. Didactic Resources

Students are provided with ample bibliographic indications.

## 21. Sustainability Objectives

The UC of General Mathematics intends to contribute to sustainability in the following areas:

General

- 1 - Ensure equal access to quality technical, professional and cultural education.
- 2 - Substantially increase the number of young people and adults with relevant qualifications, including technical and professional skills, for employment, decent work and entrepreneurship.
- 3 - Ensure equal opportunities in university education, including for people in situations of vulnerability.

## 22. Keywords

Matrix  
Determinant  
Derivative  
Bound



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### 23. Main Bibliography

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

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Author(s): António Monteiro, Isabel Matos, Virgínia Miranda  
Title: Matrizes  
Edition: 1<sup>a</sup> Year: 2018  
Local: Lisboa  
Publisher: Orion

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Author(s): António Monteiro, Isabel Matos, Virgínia Miranda  
Title: Derivadas  
Edition: 1<sup>a</sup> Year: 2017  
Local: Lisboa  
Publisher: Fundação Calouste Gulbenkian

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### 24. Complementary Bibliography

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

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

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| Ficha técnica MIP / MIP Datasheet |                                                                   |
|-----------------------------------|-------------------------------------------------------------------|
| Título / Title                    | Course Unit Program 'MATEMÁTICAS GERAIS': Academic Year 2023/2024 |
| Autor / Author                    | Dr. JOSÉ MANUEL SILVA GUERREIRO<br>LOUÇÃO DE MATOS                |
| Classificação / Classification    | -                                                                 |
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