



UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Linear Algebra

Academic Year 2023/2024

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

Computer Engineering

3. Cycle

1st

4. Course Unit

Linear Algebra (L9002)

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 PAULO JORGE GONÇALVES PINTO

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

Familiarize students with the fundamental concepts of Linear Algebra and abstract reasoning in general

15. Specific Objectives

Familiarize students with the concepts of vector space, vector subspace, linear application and other concepts, fundamental in Linear Algebra.

16. Skills to be acquired

Characterization of vector spaces and subspaces; characterization of linear applications and eigenvalue and vector; Matrix representation of linear applications.

17. Teaching Methodology

The subject is organized into theoretical-practical classes, supported by tutorial sessions. In classes, fundamental concepts will be presented and attempts will be made to illustrate them with examples.

The following are the generic provisions of the General Regulations for Knowledge Assessment.

18. Course Unit Program



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1. Matrices

1.1 Matrix calculation

1.2 Determinants

1.3 Systems of linear equations

2. $\mathbb{R}^n$ spaces

2.1. Points and vectors

2.2. Scalar addition and multiplication

2.3. Linear combination

2.4. Norm, distance and inner product.

2.5 Lines and planes in $\mathbb{R}^2$ and $\mathbb{R}^n$.

3. Vector spaces

3.1. Vector spaces.

3.2. Linear combinations.

3.3. Linear dependence and independence

3.4. Generators

3.5. Bases and dimension

3.6. Vector subspaces

3.7. Intersection and sum of vector subspaces

3.8. Dimension theorem

3.9. Direct sums

4. Linear applications

4.1. Linear applications

4.2. Core and image

4.3. Monomorphisms, epimorphisms and isomorphisms

4.4. Matrix representation of a linear application

4.5. Base changes

4.6. Eigenvalues and eigenvectors of an endomorphism

4.7. Diagonalizable endomorphisms

19. Assessment Methods

Two written tests will be made during the semester.

20. Didactic Resources

Students will be provided with written notes on class topics, as well as lists of practical exercises.



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21. Sustainability Objectives

22. Keywords

Linear algebra
Matrices
Vector space
Vector subspace
Linear application
Vector and Eigenvalue



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23. Main Bibliography

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

Author(s): António Monteiro
Title: Algebra Linear
Edition: 1ª Year: 2010
Local: Lisboa
Publisher: Dashöfer Verlag

Author(s): EH. Anton & C. Rorres
Title: Elementary Linear Algebra
Edition: 9ª Year: 2005
Local: USA
Publisher: John Wiley & Sons, Inc.

24. Complementary Bibliography

Author(s): António Monteiro
Title: Matrizes
Edition: 1ª Year: 2010
Local: Lisboa
Publisher: Dashöfer Verlag

Author(s):
Title:
Edition: Year:
Local:
Publisher:



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Ficha técnica MIP / MIP Datasheet	
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Autor / Author	Prof. Doutor PAULO JORGE GONÇALVES PINTO
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Colaborador(es) / Colaborator(s)	-
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