



UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Introduction to Mathematical Analysis

Academic Year 2023/2024

1. Organic Unit

Faculty of Business and Economic Sciences

2. Course

Computer Engineering

3. Cycle

1st

4. Course Unit

Introduction to Mathematical Analysis (L9001)

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. Doutora MARIA ADELAIDE DUARTE CARREIRA LEITE VIDEIRA

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

To introduce the main mathematical tools, fundamental to the comprehension of several subjects in engineering area

15. Specific Objectives

Review the study of Differential Calculus in R. Familiarize students with the fundamental notions of differential calculus for real functions of several real variables and optimisation.

16. Skills to be acquired

Students should be able to solve optimisation problems with functions of one variable.

Also Students should be acquainted with the concept and the properties of integrals, functions of several variables and optimisation, partial derivatives and optimisation and to be able to solve related problems.

17. Teaching Methodology

The course 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. Differential calculus in $\mathbb{R}$
 - 1.1. Generalities about real functions of real variable.
 - 1.2. The concept of derivative
 - 1.3. Application of derivatives to the study of functions. Optimisation issues.
 - 1.4. Cauchy's rule.
2. Real functions of several real variables
 - 2.1. Generalities. Domains and graphical representation. contour lines
 - 2.2. Brief indications on limits and continuity
 - 2.3. Partial derivatives. Derivation of Composite Functions
 - 2.4. Implicitly defined functions
 - 2.5. Optimization
 - 2.5.1. free extremes
 - 2.5.2. Extremes in limited and closed domains
 - 2.5.3. conditioned extremes

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

The knowledge acquired in the course is essential for the various aspects of computer engineering

22. Keywords

function
derivative
Optimisation



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23. Main Bibliography

Author(s): B.Louro; Ana Sá
Title: Cálculo Diferencial e Integral em R
Edition: 1^a Year: 2015
Local: Lisboa
Publisher: MatCubo-Bertrand

Author(s): Salas,Hille
Title: Calculus
Edition: 10^a Year: 2016
Local: New Jersey
Publisher: John Wiley and sons

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

24. Complementary Bibliography

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

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



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Ficha técnica MIP / MIP Datasheet	
Título / Title	Course Unit Program 'INTRODUÇÃO À ANÁLISE MATEMÁTICA': Academic Year 2023/2024
Autor / Author	Prof. Doutora MARIA ADELAIDE DUARTE CARREIRA LEITE VIDEIRA
Classificação / Classification	-
Descritores / Descriptors	-
Colaborador(es) / Colaborator(s)	-
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