UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Mathematics

Academic Year 2024/2025

1. Organic Unit

Faculty of Architecture and Arts

2. Course

Architecture

3. Cycle

1st

4. Course Unit

Mathematics (01308)

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	60,00
Tutorial Guidance:	

9. ECTS Credits

4,00

10. Scientific Area Coordinator

Prof. Doutor Arq. MÁRIO JOÃO ALVES CHAVES

11. Regent

Drª ELSA INÊS SILVA DO ROSARIO NEGAS

12. Assistants

13. Teaching Language

Portuguese

14. General Objectives

Art, the beautiful, the communication in a project requires curricular mathematical training is not only taught but also developed through work in an environment external to the classroom which improves curricular performance.
Create in students the awareness of the importance of mathematics in architecture and in the formation of a architect. Equip tools for calculus, data analysis, algebra and geometry Necessary for training, so that you can successfully address other subjects of your Academi

15. Specific Objectives

Elements of data analysis for reading and elaboration of studies of a statistical nature. Basics of set and function to structure the concepts of number, operation, and comparison of quantities. Notions of vector calculus and topology for consolidation of geometric transformations. Trigonometric functions, essential tools in the study of curves and surfaces. Mastery of basic notions of calculation to promote the acquisition of skills for its application.
Introduction.

16. Skills to be acquired

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The contents are approached with a theoretical-practical approach focused on solving problems related to practical applications in architecture. Through a systematic methodology of resolution: How to present the problem in quantitative terms? What are the useful concepts? Are the validity conditions verified? How to manipulate the concepts? What is the answer to the problem?
It is intended that students have a good understanding of the concepts and methods and also in the training of their con

17. Teaching Methodology

The concepts are presented, showing their historical evolution, their relevance and applicability. Whenever the subject under study allows it, the use of software and the application in the scope of the architecture is encouraged. It is always emphasized not only the applicability of the subject under study in Architecture but its relevance in the training of an architect.
The participation of students in solving problems and exercises allows them to improve their autonomy in study

18. Course Unit Program

1. Forms in architecture
1.1 The most mathematical buildings
1.2 Hyperboloid
1.3 Conoids
1.4 Scalene gabled hyperboloids
1.5 Paraboloids
1.6 Catenary
2. Descriptive statistics
2.1 Data collection and classification
2.2 Location measurements
2.3 Dispersion measures
2.4 Mergers
3. Trigonometry
3.1 Trigonometric ratios
3.2 Trigonometric functions and applications.
4 Proportions and scales
4.1 Successions defined by recurrence
4.2 Arithmetic and geometric progressions
4.3 Fibonacci succession
4.4 Proportion
4.5 The gold number and the golden ratio
5. Vector calculus
5.1 Vectors. Vector operations
5.2 One-vector standard
5.3 Orthogonality. Angle between two vectors
6. Optimization Problems
6.1 Derivation and applications to optimization problems
6.2 Integral concept and calculation of bounded plane areas

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19. Assessment Methods

The classification obtained in the continuous assessment results from the completion of 2 individual written tests, each with a weighting of 40% and a group work with a weighting of 20%

20. Didactic Resources

Practical exercises launched in Moodle, then resolved in practical class, on average weekly. Viewing of films and animations, as well as computer programs on the topological theme and gold number.

21. Sustainability Objectives

The Mathematics curricular unit being taught in the 1st year intends to gradually promote the dematerialization of the teaching/learning process, disseminating bibliography and promoting participatory readings that stimulate motivation for the protection of terrestrial life.
It is also intended to draw attention to responsibility in decision-making, which must be inclusive, participatory and representative in all domains.

22. Keywords

Angle,
Curves,
Derivative,
Descriptive Statistics,
Function,
Golden Number,
Integral,
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23. Main Bibliography

Author(s):	ELSA NEGAS		
Title:	ESTATISTICA DESCRITIVA - EXPLICAÇÃO TEORICA E CASOS		
Edition:	2º	Year:	2022
Local:	LISBOA		
Publisher:	SILABO		

Author(s):	HERMANN WEYL		
Title:	SIMETRIA		
Edition:	1ª	Year:	2017
Local:	LISBOA		
Publisher:	GRADIVA		

Author(s):	FILIPE CARVALHO, SILVIA CARVALHO		
Title:	MATEMATICA ZERO		
Edition:	1º	Year:	2021
Local:	LISBOA		
Publisher:	SILABO		

24. Complementary Bibliography

Author(s):	SUE PEMBERTON JULIAN GILBEY		
Title:	PURE MATHEMATICS 1		
Edition:	LIVRO	Year:	2018
Local:	CAMBRIDGE		
Publisher:	CAMBRIDGE INTERNATIONAL AS & A LEVEL		

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

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Título / Title	Course Unit Program 'MATEMÁTICA': Academic Year 2024/2025
Autor / Author	Prof. Doutor Arq. MÁRIO JOÃO ALVES CHAVES
Classificação / Classification	-
Descritores / Descriptors	-
Colaborador(es) / Colaborator(s)	-
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