Course Unit	Mathematics			Field of study	Mathematics		
Bachelor in	Marketing			School	School of Public Management, Communication and Tourism		
Academic Year	2023/2024	Year of study	1	Level	1-1	ECTS credits	6.0
Type	Semestral	Semester	1	Code	9205-714-1105-00-23		

Workload (hours)	162	Contact hours	T -	TP 60	PL -	TC -	S -	E -	OT -	O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Maria de la Salete Dias Esteves

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Read, write and use mathematic language proficiently.
2. Manipulate mathematical expressions skillfully.
3. Apply functions to model and solve problems.
4. Recognize the meaning of formulas, interpret graphs in real context situations and be able to use them when solving problems.

Prerequisites

Before the course unit the learner is expected to be able to:
Apply K-9 Mathmatics knowledges.

Course contents

Real functions about a real variable. Exponential function. Logarithmic function. Limit and Continuity. Rate of Change and the Derivative of a Function. Matrix algebra.

Course contents (extended version)

1. Matrix algebra
   - Definitions
   - Operations with matrices
   - Gaussian Elimination and rank of a matrix
   - Solving linear systems of equations
   - Determinants
   - Inverse of a regular matrix
2. Real functions about a real variable
   - Study of the characteristics of a function: analytical and graphical study
   - Roots, sign and monotony of a function
   - Absolute and relative extrema
   - injective function
   - Operations with functions
   - Linear, quadratic, exponential and logarithmic functions
3. Limit and Continuity
   - Limit a of a function
   - Some properties of limits
   - Limits and infinity
   - Continuity
4. Derivative of a function
   - Average rates of change
   - Definition of derivative of a function
   - Geometric interpretation of the derivative as a slope
   - The derivative function
   - Higher order derivatives
   - Applications of the derivative

Recommended reading

1. Anton, H. & Rorres, C. (2013). Elementary Linear Algebra, Applications Version (11.ª Ed.). Wiley. ISBN: 9781118878767
2. Barroso, M. , Sampaio, E. , & Ramos, M. (2001). Exercícios de Métodos Quantitativos para Ciências Sociais. Edições Sílabo. ISBN: 9789726182627.
3. Carvalho, F. & Carvalho, S. (2021). Matemática. Edições Sílabo. ISBN: 9789895612758.
4. Goldstein, L. (2005). Matemática Aplicada - Economia, Administração e Contabilidade (10. ª Ed.). Bookman. ISBN: 9788536305615.
5. Tan, S. T. (2012). Applied Mathematics: for the managerial, life, and social sciences (6th Ed). Belmont: Brooks/Cole, Cengage Learning. ISBN: 9781133108948.

Teaching and learning methods

Theoretical and practical classes with written documentation and explanation of the contents; presentation of examples; guided problem solving; students are motivated to participate in all debates concerning the above matters.

Assessment methods

1. Final Evaluation 1 - (Regular, Student Worker) (Final, Supplementary)
   - Intermediate Written Test - 40% (Admission requirements: attendance, except for Student-Workers.)
   - Final Written Exam - 60% (Admission requirements: attendance, except for Student-Workers.)
2. Final Evaluation 2 - (Regular, Student Worker) (Final, Supplementary)
   - Intermediate Written Test - 60% (Admission requirements: attendance, except for Student-Workers.)
   - Final Written Exam - 40% (Admission requirements: attendance, except for Student-Workers.)
3. Final Evaluation 3 - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100%
4. Incoming and outgoing students - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100%

Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Maria de la Salete Dias Esteves	Luisa Margarida Barata Lopes	Anabela Neves Alves de Pinho	Sonia Paula da Silva Nogueira
23-10-2023	23-10-2023	23-10-2023	23-10-2023