

Course Unit	Applied Mathematics for Management	Field of study	Economy and Management/Mathematical and Quantitative Methods
Bachelor in	Public Management and Administration	School	School of Public Management, Communication and Tourism
Academic Year	2022/2023	Year of study	2
Type	Semestral	Semester	1
Level	1-2	ECTS credits	6.0
Code	9165-315-2103-00-22		
Workload (hours)	162	Contact hours	T - , TP 60, PL - , TC - , S - , E - , OT 20, 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) Ricardo Jorge Vieira Correia

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Read, write and use financial-mathematical language with fluidity;
2. Model and solve problems using financial calculus concepts;
3. Understand the scope of financial operation and the meaning of three variables involved: capital, time and interest rate;
4. Understand the golden rule of financial calculus: to compare capitals it's necessary to reported them to the same moment;
5. Understand the concept of accumulated capital in Simple and Compound Interest regimes, as well as the simple and compound capitalization factor;
6. Understand the concept of rents in its several forms, as well as how to prepare the amortization table of a bank loan and bond.

### Prerequisites

Before the course unit the learner is expected to be able to:  
Use the language and elementary techniques of mathematics.

### Course contents

1) Introduction and basic concepts; 2) Capitalization schemes; 3) Interest Rates; 4) Equivalence of capitals; 5) Rents; 6) Repayment of loans.

### Course contents (extended version)

1. INTRODUCTION
  - Basic concepts. Time, capital and interest. Interest rate.
2. CAPITALIZATION SCHEMES
  - Simple interest regime.
  - Compound interest regime.
3. INTEREST RATES.
  - Proportional and equivalent rates.
  - Nominal and effective interest rates.
4. EQUIVALENCE OF CAPITALS
  - Capitalization and Actualization.
  - Capitalization and Actualization in Simple Interest regime.
  - Capitalization and Actualization in Compound Interest regime.
5. RENTS
  - Concept. Immediate and deferred rents: anticipated and posticipated rents;
  - Certain, whole, split and constant terms rents.
  - Other rents: Leasing, financial leasing and long-term rental.
6. REPAYMENT OF LOANS
  - Classical repayment of loans: French, american and constant amortization Systems.
  - Amortization table.
  - Leasing and financial leasing.

### Recommended reading

1. Laureano, R. & Santos, L. (2011). Fundamentos de Cálculo Financeiro (1ª ed. ). Lisboa: Edições Sílabo. ISBN: 978-972-618-642-7.
2. Laureano, R. & Santos, L. (2003). Fundamentos e aplicações do Cálculo Financeiro. Lisboa: Edições Sílabo. ISBN: 978-618-308-1.
3. Mateus, A. (2009). Cálculo Financeiro (3ª ed. ). Lisboa: Edições Sílabo. ISBN: 978-972-618-274-0.
4. Matias, R. (2004). Cálculo Financeiro - Teoria e Prática (2ª ed. ). Lisboa: Escolar Editora. ISBN 978-972-592-210-1.
5. Rodrigues, J. & Nicolau, I. (2005). Elementos de Cálculo Financeiro (8ª ed. ). Lisboa: Areas Editora. ISBN 972-8472-91-9.

### Teaching and learning methods

All topics will be exposed in classes where students can take part on their analysis and discussion. A book of exercises complements the course texts where students have the opportunity to learn and consolidate their skills.

### Assessment methods

1. Distributed Evaluation - (Regular, Student Worker) (Final, Supplementary)
  - Intermediate Written Test - 50% (It is required a minimum score of 7 values.)
  - Final Written Exam - 50% (It is required a minimum score of 7 values.)
2. Final Evaluation Exam - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100% (Alternative to distributed evaluation. Exam, including all the contents.)
3. Exchange students (incoming) - (Regular, Student Worker) (Final, Supplementary, Special)
  - Development Topics - 100% (Project about one subject of course contents.)

### Language of instruction

Portuguese, with additional English support for foreign students.

## Electronic validation

Ricardo Jorge Vieira Correia	Bernadete de Lourdes Bittencourt	Catarina Alexandra Alves Fernandes	Luisa Margarida Barata Lopes
11-10-2022	11-10-2022	11-10-2022	16-10-2022