

Course Unit	Financial Mathematics		Field of study	Management	
Bachelor in	Management		School	School of Technology and Management	
Academic Year	2022/2023	Year of study	1	Level	1-1
Type	Semestral	Semester	2	ECTS credits	6.0
Code	9147-707-1204-00-22				
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) Ana Paula Carvalho do Monte, Marcio Manuel Rebelo Felix, Rogerio Gouveia Bessa

Learning outcomes and competences

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

1. Have knowledge regarding financial operations and the meaning of the variables involved in it - principal, time and interest (rate);
2. Understand the basic rule: to compare cash amounts it is necessary to report them to the same date;
3. Understand the concept of future value and present value in simple interest and compound interest as well the compound factor and discounted factor;
4. Understand the concepts of installments; redemption of principal, interest, deferred period and grace period;
5. Use the knowledge about annuities and equivalence of rates and capital to solve concrete problems in the organization management and personal finance;
6. Create loans/mortgage schedules;
7. Understand the basics of life insurance, particularly the relation to annuities.

Prerequisites

Before the course unit the learner is expected to be able to:
Use knowledge of mathematics for management.

Course contents

Basic concepts. Compounding and discounting methods. Equivalence of capital and interest rates. Annuities. Loan amortisation. Short, medium and long-term financial product. The basics of Life and non-life Insurance.

Course contents (extended version)

1. Basic concepts
 - Time value of money;
 - Interest rate and discount rate;
 - Present value and future value.
2. Compounding and discounting methods
 - Simple interest;
 - Compound interest.
3. Equivalence of capital and interest rates
 - Single capital, average maturity and average rate;
 - Equivalence of interest rate: in simple and compound interest rate method;
 - Effective annual rate and All-in-cost rate.
4. Annuities
 - Definition and classification;
 - Simple annuities with constant terms (ordinary and due);
 - Simple annuities, with deferred constant terms;
 - Simple annuities with variable terms;
 - General annuities;
 - Perpetuities.
5. Loan amortisation
 - Amortisation methods;
 - Classic loan amortisation plans.
6. Short, medium and long-term financial products
 - Discounted bank notes and promissory notes;
 - Factoring;
 - Cash advance loans;
 - Leasing;
 - Bond amortisation schedule.
7. The basics of Life and non-life Insurance

Recommended reading

1. Matias, F. , Martins, A. , Monteiro, C. , & Correia, T. (2020). Matemática Financeira: Teoria e Prática. Edições Silabo.
2. Matias, R. (2018). Cálculo Financeiro: Teoria e Prática (6.ª Edição). Escolar Editora.
3. Matias, R. (2020). Cálculo Financeiro: Exercícios Resolvidos e Explicados, vol. II (2.ª Edição). Escolar Editora.
4. Quelhas, A. P. , & Correia, F. (2017). Manual de Matemática Financeira (4.ª Edição). Livraria Almedina.
5. Rodrigues, J. A. & Nicolau, I. (2010). Elementos De Cálculo Financeiro (9.ª Edição). Áreas Editores.

Teaching and learning methods

Theoretical-practical classes where theory and applied examples are presented as well as concrete situations, case studies and practical exercises, are solved and discussed which allow not only the exchange of experience but also the practice of decision-making group and that help to consolidate the learning outcomes.

Assessment methods

1. Alternative 1 - (Regular, Student Worker) (Final, Supplementary)
 - Case Studies - 15% (1 Case Study solved in teams in the classroom)
 - Intermediate Written Test - 15% (2 online tests. If the average is less than 5 values, students can move to alternative 2)
 - Intermediate Written Test - 50% (It is mandatory to reach a minimum score of 5 (in 20) for approval)
 - Practical Work - 10% (Practical exercises for assessment randomly and without any announcement)
 - Practical Work - 10% (weekly homework to be upload at "activities" in IPBVirtual; attendance, motivation and participation)
2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)

Assessment methods			
- Final Written Exam - 100%			
Language of instruction			
Portuguese, with additional English support for foreign students.			
Electronic validation			
Ana Paula Carvalho do Monte	Paula Odete Fernandes	António Borges Fernandes	José Carlos Rufino Amaro
17-03-2023	18-03-2023	21-03-2023	25-03-2023