INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Financial Mathematics			Field of study	Management		
Bachelor in	Accounting			School	School of Technology and Management		
Academic Year	2021/2022	Year of study	1	Level	1-1	ECTS credits	6.0
Type	Semestral	Semester	2	Code	9056-514-1204-00-21		

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, Gilberto Jose Araujo Baptista, Joaquim Aurelio Coelho Alves

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-pratical 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 - 30% (1 Case Study (20%) in team; attendance, motivation and deliver of homeworks (10%))
   - Intermediate Written Test - 30% (3 online tests. If the average is less than 5 values, students can move to alternative 2)
   - Intermediate Written Test - 40% (It is mandatory to reach a minimum score of 5 (in 20) for approval)
2. Alternative 2 - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100%

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Language of instruction

Portuguese, with additional English support for foreign students.

Electronic validation

Ana Paula Carvalho do Monte	António Borges Fernandes	Oliva Maria Dourado Martins	Paulo Alexandre Vara Alves
28-02-2022	02-03-2022	03-03-2022	22-03-2022

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