UNIVERSIDADE LUSÍADA
LISBOA

Course Unit Program
Financial Calculus

Academic Year 2023/2024

## 1. Organic Unit

Faculty of Business and Economic Sciences

## 2. Course

Business Management

## 3. Cycle

1st

## 4. Course Unit

Financial Calculus (24109)

## 5. Scientific Area

## 6. Curricular Year

1st

## 7. Type of Curricular Unit / Semester

2nd Semester



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## 8. Class type and workload (work time)

| | |
|---|---|
| Theoretical classes: | |
| Practical classes: | |
| Theoretical-Practical Classes | 30,00 |
| Tutorial Guidance: | 20,00 |

## 9. ECTS Credits

6,00

## 10. Scientific Area Coordinator

## 11. Regent

Prof. Doutor MIGUEL ALEXANDRE TEIXEIRA COELHO

## 12. Assistants

Dr. LUIS FILIPE COSTA TORRES CAPAZ COELHO

## 13. Teaching Language

Portuguese

## 14. General Objectives

The curricular unit was conceived with the aim of providing the student with training in the following areas:
1. Interest rate regimes
2. Capital equivalence
3. Annuities
4. Loan Repayments

## 15. Specific Objectives

1. Familiarize students with simple interest and compound interest.
2. Ensure students have an adequate understanding of the main concepts associated with financial calculation.
3. Identify the student with the main types of annuities.
4. Provide the student with analytical instruments for calculating interest and amortization of capital in different types of loans.
5. Familiarize students with the main financial products provided by Credit Institutions.

## 16. Skills to be acquired

1. Ability to make decisions and solve financial problems.
2. Ability to formulate financial hypotheses, resolve and compare results.
3. Ability to criticize and self-criticize content of a financial nature.
4. Proficiency in communication, oral and written, in the context of financial calculus.



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## 17. Teaching Methodology

The method combines theoretical exposition (know-how) with the resolution of practical cases and simulation exercises (know-how), covering the framework, concepts and models inherent to each of the subjects to be taught. It also seeks to discuss the conciliation between theoretical knowledge and practical knowledge in real contexts, thus ensuring a phronetic perspective (wisdom) of the subject.

## 18. Course Unit Program



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I. Capitalization regimes

I.1 Introduction.
I.2 Capitalized value and current value.
I.3 Interest regime.
I.3.1 Simple interest system.
I.3.2 Capitalization process.
I.3.3 Discount process.
I.4 Compound interest system.
I.4.1 Capitalization using compound interest.
I.4.2 Update of capitals.
I.5 Relations between interest rates.
I.6 Proportional interest rates.
I.7 Equivalent interest rate.
I.8 Effective and Nominal interest rates.
I.9 Instantaneous capitalization rate.

II. Capital equivalence

II.1 Introduction.
II.2 Equivalent capital and equation of value.
II.2.1 Simple interest rate regime.
II.2.2 Compound interest rate regime.
II.3 Common capital.
II.3.1 Simple interest rate regime.
II.3.2 Compound interest rate regime.
II.4 Common duration.
II.5 Average duration.
II.6 Internal rate of return.
II.7 Average interest rate.
II.7.1 Average interest rates with a single capital.
II.7.2 Average interest rates with different capitals.

III. Annuities

III.1 Introduction.
III.2 Immediate annuities with normal terms.
III.2.1 Current value.
III.2.2 Accumulated value.
III.3 Immediate annuities with anticipated terms.
III.4 Deferred annuities.
III.5 Perpetual annuities.
III.6 Annuities with variable terms.



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III.6.1 Variable terms in general.
III.6.2 Variable terms in arithmetic progression
III.6.3 Variable terms in geometric progression.
III.7 Fractional terms.

IV. Repayment of loans

IV.1 Introduction.
IV.2 Type 1: Capital amortization and interest paid in one lump sum at the maturity.
IV.3 Type 2: Capital amortization at maturity and interest paid at the beginning.
IV.4 Type 3: Interest paid over the life of the loan and capital amortization at maturity.
IV.5 Type 4: Interest paid at the beginning and capital amortization over the term of the loan.
IV.6 Type 5: Interest paid at maturity and capital amortization over the term of the loan.
IV.7 Type 6: Interest payment and capital amortization over the term of the loan.
IV.7.1 Constant capital amortization.
IV.7.2 Constant installment.

V. Products and financial instruments

V.1 Introduction.
V.2 Passive and active operations in the banking system.

## 19. Assessment Methods

Continuous assessment is based on carrying out 2 mid term exams.

## 20. Didactic Resources

Adopted books
power point
Videos
Internet

## 21. Sustainability Objectives

Sustainable finance corresponds to the new finance paradigm of reorienting financial flows towards sustainable investments considering, namely, Environmental, Social and Governance (ESG) aspects.
In this context, the curricular unit seeks to sensitize students to the importance of financial calculation in the pursuit of sustainable financial principles.

## 22. Keywords

1. Capitalization regimes
2. Capital equivalence
3. Annuities
4. Repayments of Loans



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## 23. Main Bibliography

| | | | |
|---|---|---|---|
| Author(s): | Coelho, M e Coelho, L | | |
| Title: | Calculo Financeiro: Manual Para Entender os Princípios do Calculo Financeiro - Volume I | | |
| Edition: | 1ª Edição | Year: | 2016 |
| Local: | Lisboa | | |
| Publisher: | Quid Juris | | |

| | | | |
|---|---|---|---|
| Author(s): | Coelho, M e Coelho, L | | |
| Title: | Calculo Financeiro: Manual Para Entender os Princípios do Calculo Financeiro - Volume II | | |
| Edition: | 1ª Edição | Year: | 2017 |
| Local: | Lisboa | | |
| Publisher: | Quid Juris | | |

| | | | |
|---|---|---|---|
| Author(s): | Barroso, M. N., Couto, E., & Crespo, N. | | |
| Title: | Cálculo e instrumentos financeiros: Da prática para a teoria | | |
| Edition: | 2.ª ed. | Year: | 2009 |
| Local: | Lisboa | | |
| Publisher: | Escolar Editora | | |

## 24. Complementary Bibliography

| | | | |
|---|---|---|---|
| Author(s): | Coelho, M. e Oliveira, R. | | |
| Title: | Mercados: São Mesmo os Grandes Culpados das Crises? | | |
| Edition: | 1ª | Year: | 2015 |
| Local: | Lisboa | | |
| Publisher: | Bnomics | | |

| | | | |
|---|---|---|---|
| Author(s): | Sherman, H. J., Richardson, L. I., & Yard, G. J. | | |
| Title: | Teaching learners who struggle with mathematics: Systematic intervention and remediation | | |
| Edition: | | Year: | 2009 |
| Local: | Upper Saddle River, NJ | | |
| Publisher: | Pearson/Merrill Prentice Hall | | |



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| Ficha técnica MIP / MIP Datasheet | |
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| Autor / Author | Prof. Doutor MIGUEL ALEXANDRE TEIXEIRA COELHO |
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