COURSE DATA

Data Subject

Code	35804
Name	Financial mathematics
Cycle	Grade
ECTS Credits	6.0
Academic year	2018 - 2019

Study (s)

Degree	Center	Acad. year	Period
1313 - Degree in Business Management and Administration	Faculty of Economics	2	First term
1330 - Degree in Business Management and Administration (Ontinyent)	Faculty of Economics	2	First term
1921 - D.D. in Business Management Administration-Law	Doubles Studies Faculty of Law - Faculty of Economics	2	Second term
1926 - D.D. in Tourism-Business Management Administration	Faculty of Economics	3	First term

Subject-matter

Degree	Subject-matter	Character
1313 - Degree in Business Management and Administration	7 - Financial mathematics	Obligatory
1330 - Degree in Business Management and Administration (Ontinyent)	7 - Financial mathematics	Obligatory
1921 - D.D. in Business Management Administration-Law	3 - Year 2 compulsory subjects	Obligatory
1926 - D.D. in Tourism-Business Management Administration	4 - Asignaturas de tercer curso	Obligatory

Coordination

Name	Department
GONZALEZ BAIXAULI, EUSEBIO CRISTOBAL	113 - Financial and Actuarial Economics
LUCIA LOPEZ, JULIO JESUS	113 - Financial and Actuarial Economics
SORIANO FELIPE, PILAR	113 - Financial and Actuarial Economics

SUMMARY

The main objective of this subjec is to provide students with a solid and generic framework to analyze complex financial transactions. On completion of this course the student should be able to quantify the financial variables in any particular transaction and take the appropriate decisions based on the measurement of the cost and return on the transaction for the borrower and the lender, respectively.
This generic aim can be expressed through the following particular goals:
• To obtain an overview of the scope of Financial Mathematics.
• To master the fundamental concepts of Financial Mathematics.
•To accurately apply the standard valuation model in financial mathematics for the analysis of the most usual financial transactions.
•To develop skills to be applied in the analysis of new financial transactions that could come out in the financial markets.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

No prior knowledge is required.

OUTCOMES

1313 - Degree in Business Management and Administration

- Demonstrate capacity for analysis and synthesis.

- Have organisation and planning skills.

- Be able to use ICTs in the field of study.

- Be able to work in a team.

- Manage time effectively.

- Be able to learn autonomously.

- Be able to understand and analyse financial markets, as well as financial operations related to business.

- Be able to express oneself in formal, graphic and symbolic languages.

- Know the fundamentals that govern financial operations and markets.

- Be able to correctly apply a common valuation model for the analysis of investment and financing operations.

1330 - Degree in Business Management and Administration (Ontinyent)

- Demonstrate capacity for analysis and synthesis.

- Have organisation and planning skills.

- Be able to use ICTs in the field of study.

- Be able to work in a team.

- Manage time effectively.

- Be able to learn autonomously.

- Be able to understand and analyse financial markets, as well as financial operations related to business.

- Be able to express oneself in formal, graphic and symbolic languages.

- Know the fundamentals that govern financial operations and markets.

- Be able to correctly apply a common valuation model for the analysis of investment and financing operations.

LEARNING OUTCOMES

• To obtain an overview of the scope of Financial Mathematics.
• To analyze and describe financial transactions by using a mathematical model and to quantify the financial variables that exist in any particular financial transaction.
• To have basic knowledge of the fundamentals of Financial Mathematics in order to apply them to solve any new transaction that could come out in the financial markets.

DESCRIPTION OF CONTENTS

1. Fundamentals

1.1 Introduction.
1.2 Financial rules.

2. Theory of compound interest

2.1 Compound interest rule.
2.2 Financial Factor.
2.3 Revenue.
2.4 Interest rate.
2.5 Financial Addition.
2.6 Financial transaction

3. Financial value of payments: introduction to annuities

3.1 Financial value of a set of payments.

3.2 Annuities. Financial value of an annuity.

3.3 Valuing constant annuities.

3.4 Valuing varying annuities.

4. Complex annuities

4.1 Valuing annuities payable monthly.

4.2 Other complex annuities.

5. Financial transaction: financial equivalence and outstanding balance

5.1 Definition and classification.

5.2 General approach.

5.3 Outstanding balance. Concept, calculation methods and evolution.

6. Cost and return: effective rates

6.1 Effective rate of a pure financial transaction.

6.2 Effective rate of a financial transaction whit additional terms and conditions.

6.3 A.P.R.(T.A.E in the Spanish case).

7. Amortization of a debt: general analysis

7.1 Definition.

7.2 Financial equivalence.

7.3 Outstanding balance.

7.4 Total payment descomposition.

7.5 Other variables and relationships.

8. Loans with predetermined rates

8.1 Bullet loan.

8.2 Level-payment fixed-rate loan.

8.3 Constant principal repayments loan.

8.4 Other loans:loans with fractional interest payments.

9. Adjustable-rate loans

9.1 Adjustable-rate amortizationtransactions
9.2 Adjustable -rate loans.
9.3 Other adjustable-rate loans with fixed term: known principal repayments.

10. Bonds

10.1 Bons issue: concept and types.
10.2 Financial analysis.
10.3 Issue's cost and return.
10.4 Bond's market value.
10.5 Interest rate risc.

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	30,00	100
Classroom practices	30,00	100
Development of individual work	5,00	0
Study and independent work	40,00	0
Readings supplementary material	1,00	0
Preparation of evaluation activities	20,00	0
Preparing lectures	7,00	0
Preparation of practical classes and problem	7,00	0
Resolution of case studies	10,00	0
TOTAL	**150,00**	

TEACHING METHODOLOGY

There will be **a two-hour lecture plus a two-hour practice session per week**, thus totaling four classroom hours per week.

Practice sessions will consist of solving exercises, working on case studies, developing workshops, presentations and discussions, etc. Lecture slides and practice sessions guidelines and relevant materials will be uploaded onto the course's **virtual classroom** (www.aulavirtual.uv.es).

Should the students have any course-related queries, questions or feedback, or should they need any guidance or advice on practice assignments, they are encouraged to take advantage of the (voluntary) office tutorials during the lecturer's office hours.

Methodology in this subject is both self-study and working-in-groups oriented in lectures and, especially, in practice sessions (example classes). Specifically, the methodology to be used is as follows:

For the lectures, students should previously read the notes available in the course's **virtual classroom** (www.aulavirtual.uv.es). The lecturer will combine during the lecture his/her explanations with the active participation of the students (they should raise their doubts, try to help their classmates, and participate in discussions in group about the most controversial concepts). The objective is to improve the autonomous capacity of the students (individual work at home previous to the lecture) as well as their ability to work in groups, to argue and defend ideas (debate groups), and their oral and written communication skills.

Example classes, in turn, will be carried out combining two different strategies. On the one hand, the lecturer will solve standard problems in the classroom in order for students to learn to identify the key aspects of the corresponding approach in each unit. On the other hand, students will have to solve analogous problems, sometimes in the classroom, and usually as a part of their homework. Occasionally some solved problems will have to be handed in, and this will be part of the continuous assessment.

EVALUATION

The course grade will be based on:

1) The final examination marks (up to 70% of the final grade). The final exam will be administered according to the official schedule and it will include questions and problems regarding both theory and practice (exercises).

2) The remaining 30% can be obtained through activities developed by the student during the term, such as: problem solving, periodic assessment tests, and any other type of continuous assessment tasks.

The final grade will be given by the sum of the previous concepts. Nonetheless, in order to get a passing grade at the end of the term, **the student must pass the final exam** (answer at least 50% of the exam questions correctly), **which is compulsory.** In case of failing the exam, the maximum grade that the student can obtain as the sum of all the items will be 4.5 marks.

Exams will be regulated by Article 13 on examination fraud of the "Reglament d'avaluació i qualificació de la Universitat de València per a títols de grau i màster, ACGUV 108/2017". Additionally, all the assessment tasks and homework will be subject to the regulation on plagiarism detailed in Article 15.2 of the same "Reglament".

For the second examination call, the same criteria of evaluation and weighting as for the first call will be used. Those students who are evaluated on the second call will maintain the grade obtained in section 2 above, and they will not be allowed to complete any tasks or homework that had not been previously considered for the first call.

REFERENCES

Basic

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- Dalton, B. (2008): Financial products: an introduction using mathematics and Excel, Cambridge University Press. [S i336 DAL]

Additional

- Apraiz, A. (2003): Fundamentos de Matemática Financiera. Editorial Desclée de Brouwer. Bilbao.

- Cabello, J.M., Gómez, T., Rodríguez, R., Ruíz, F. y Torrico, A. (1999): Matemáticas financieras aplicadas: 127 problemas resueltos. Editorial AC. Madrid.

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