

BACHELOR IN BUSINESS ADMINISTRATION

SECOND YEAR 2013-2014

Course	Financial Mathematics	Code	802272
Module	Basic Subject	Area	Finance
Status	Core		
Credits	6	Attendance	4
		Non-Attendance	2
Year	2	Term	2

INSTRUCTOR, GROUPS AND TIMETABLES

Department	Financial Economy and Accountancy I		
Coordinator	E-mail	Office	Office Hours
Ana Vicente Merino	anavicente@ccee.ucm.es	204	
Lecturer			
M ^a Jesús Segovia Vargas	mjsegovia@ccee.ucm.es	109	Tu. 12:30-14:30; Fr 12:30-13:30

Lecturer	Group	Timetable Lecturers	Timetable Seminars (every two weeks)
M ^a Jesus Segovia	E	Fr. 10:30-12:30 Tu. 8:30-10:30	Fr: 10.30-12.30

SYNOPSIS

BRIEF DESCRIPTION
The study of the basic concepts and principles of financial valuation in an environment of certainty and the use of these tools for analyzing the different kinds of financial operations, from simple transactions to the accumulation of a final capital or the amortization of loans. To assist the decision-making process within organizations and, in particular, within corporations. The acquired knowledge will set the basis for the elaboration and interpretation of the financial information within those organizations.

PRE-REQUISITES

Quantitative knowledge of year 1 courses.

AIMS AND OBJETIVES

OBJETIVES (Learning outcomes)

The fundamental target of this course is to provide the student with the necessary knowledge for the analysis of financial transactions and for the adoption of decisions in an environment of certainty as well as the preparation of the basic financial information within corporations.

SKILLS

Analysis and synthesis ability to solve problems
Organizing and planning ability.
Communication and teamwork ability to take decisions
Ability to interpret economic events for their financial assessment.

SYLLABUS

Lesson 1 BASIC CONCEPTS

- Financial event. Capital. Interest.
- Financial choice. The equation of value and the yield on a transaction.
- Financial law and financial system. Properties.
- Operations with financial capitals: Sum of capitals.

Lesson 2 FINANCIAL MAGNITUDES

- Yield. Rate of interest.
- Financial factors.
- Theory of interest rate. Instant rate of interest. Properties and interpretation

Lesson 3 FINANCIAL TRANSACTIONS. SIMPLE AND COMPOUND INTEREST FOR ACCUMULATION AND DISCOUNT.

- Financial transactions.
- Simple interest.
- Compound interest. Nominal and effective rates of interest
- Commercial discount (simple interest).
- Discount (compound interest).

Lesson 4 ANNUITIES (CERTAIN) (I)

- Financial concept of an annuity-certain. Financial value of an annuity (certain).
- Classification and properties.
- Constant payments. Annuity-due. Payments in arrears.
- Perpetuities. Deferred and immediate annuities and perpetuities.

Lesson 5 ANNUITIES (CERTAIN) (II)

- Variable annuities (geometric and arithmetic growth). Increasing annuity.
- Annuities payable m-thly.
- Annuities continuously payable.

- Cash flows valuation. IRR and Discounted value.

Lesson 6 FINANCIAL TRANSACTIONS. GENERAL APPROACH

- Concept and elements. Financial Equivalence.
- Classification.
- Mathematical Reserve.
- Financial valuation of a contract.
- Commercial features in a financial transaction.
- Effective interest rate. Annual effective interest rate

Lesson 7 SIMPLE FINANCIAL TRANSACTION

- Static and dynamic analysis.
- Short and long term transactions.
- Financial value of a transaction.

Lesson 8 FINANCIAL TRANSACTIONS OF ACCUMULATION

- Static and dynamic analysis.
- Commercial features. Effective rates
- Examples: Pension plans, endowment...

Lesson 9 FINANCIAL TRANSACTIONS OF AMORTIZATION, LOANS (I)

- General overview: Static and dynamic analysis.
- Repayment methods.
- Equal installments.
- Equal amortization.
- Sinking fund.
- Variable installments (Linear and geometric growth).

Lesson 10 FINANCIAL TRANSACTIONS OF AMORTIZATION, LOANS (II)

- Indexed loans.
- Payment of interest in advance
- Financial value of a loan. Beneficial and bare ownerships.
- Commercial features. Effective interest rate.

Lesson 11 INTRODUCTION TO THE STUDY OF BONDS

- General overview.
- Issues on bonds from the point of view of the issuer.

TEACHING ACTIVITIES

Theoretical classes

% of Total Credits

20%

Each topic of the Syllabus will be dealt with in a different session. The student should research each topic further outside classes, and acquire practical knowledge by solving exercises.

Practical classes

% of Total Credits

20 %

Practical problems and exercises will be proposed and solved, to show how to apply the theoretical knowledge. Excel will be used to solve exercises.

Other activities	% of Total Credits	60 %
Seminars 5% Individual or group tutorials 5%, Assessment activities 5% Projects 20% Study Hours 25%		
ASSESSMENT		
Exams	% Share of final grade	
Final Exam	70 %	
Other activities	% Share of final grade	
Tests	25%	
Projects	5%	
ASSESSMENT CRITERIA		
Continuous assessment	30%	
Final exam	70%	

ORIENTATIVE CHRONOGRAM

WEEK	TOPIC	CLASS ACTIVITIES	SEMINARS
1	Lesson 1: Basic Concepts	Study of the contents of the topic	
2	Lesson 2: Financial Magnitudes	Study of the contents of the topic	Exercises
3	Lesson 2: Financial Magnitudes	Study of the contents of the topic	
4	Lesson 3: Financial Transactions. Simple and compound interest for accumulation and discount.	Study of the contents of the topic	Exercises.
5	Lesson 4: Annuities (Certain)	Study of the contents of the topic	
6	Lesson 4: Annuities (Certain)	Study of the contents of the topic	Exercises.
7	Lesson 5: Financial Transactions: General Approach.	Study of the contents of the topic Test 1	
8	Lesson 6: Simple financial transactions	Study of the contents of the topic	Exercises
9	Lesson 7: Financial transactions of accumulation	Study of the contents of the topic	
10	Lesson 7: Financial transactions of accumulation	Study of the contents of the topic	Exercises.
11	Lesson 8: Financial Transactions of Amortization. Loans.	Study of the contents of the topic	.
12	Lesson 8: Financial Transactions of Amortization. Loans.	Study of the contents of the topic	Exercises.
13	Lesson 8: Financial Transactions of Amortization. Loans.	Study of the contents of the topic Test 2	
14	Lesson 9: Introduction to the study of bonds (bond set).	Study of the contents of the topic	Exercises.

RESOURCES

BASIC BIBLIOGRAPHY
<p>ROBERT BROWN, STEVE KOPP, PETR ZIMA: Mathematics of Finance. Mc Graw Hill PETR ZIMA, ROBERT BROWN: Mathematics of Finance. SCHAUM'S OUTLINE Mc Graw Hill</p>
FUTHER READING
<p>Links posted in the "virtual campus" (on line campus).</p>
OTHER RESOURCES
<ul style="list-style-type: none"> • Slides from lecturers • Exercises in the virtual campus