



## IDENTIFYING DATA

### Company: Mathematics of financial transactions

Subject	Company: Mathematics of financial transactions			
Code	V03G020V01202			
Study programme	(*)Grao en Administración e Dirección de Empresas			
Descriptors	ECTS Credits 6	Choose Basic education	Year 1st	Quadmester 2nd
Teaching language	Spanish			
Department				
Coordinator	Rodríguez Parada, Sonia			
Lecturers	Lago Velando, Ángeles López Corrales, Francisco Javier Rodríguez Parada, Sonia			
E-mail	srparada@uvigo.es			
Web	<a href="http://fatic.uvigo.es/index.php/es/">http://fatic.uvigo.es/index.php/es/</a>			
General description	Financial Mathematics is a subject that opens the door to financial understanding and introduces the student into the logical rationale of financial valuation. This knowledge is fundamental to make right decisions and properly appreciating information in the field of Finance and Accounting. Under the basic principle of the time value of money, the student fully comprehends and applies the mathematical-financial methodology to the analysis of the most frequent financial transactions.			

## Competencies

Code	
B1	Ability to analyse and synthesise
B2	Critical and self-critical thinking
B3	Skills related to the use of those computer applications used in business management
B13	Capacity for learning and independent work
C7	Acquire and understand knowledge regarding: The main instrumental techniques applied to the business context
C9	Identify the generalities of the economic problems posed in companies, and know how to apply the main instruments available in order to address these problems
C12	Solve problems effectively and make decisions using the appropriate quantitative and qualitative methods, including the identification, expression and solution of business problems
C13	Mobility and adaptability to different contexts and situations
C16	Skills in looking for, identifying and interpreting sources of relevant economic information
D3	Responsibility and the capacity to take on commitments
D4	Ethical commitment in work
D5	Motivation for quality and continuous improvement

## Learning outcomes

Expected results from this subject	Training and Learning Results	
Application of the most appropriate financial valuation tools to address the proposed issues	B1	C9 C12
Fluency in solving basic financial problems and adequately interpreting the results	B1	C12
Ease in use technical vocabulary and financial mathematics symbols	B1	C7
Good judgment concerning the consistency of the performed financial calculation	B2	
Application of financial functions on spreadsheets	B3	
Efficient learning management	B13	

Identification of the general field of Financial Mathematics	C7
Analysis of the essential financial transaction features	C7
Extension of financial valuation rationale to new transactions	C13
Management of reliable and up-to-date economic and financial information sources	C16
Use of feedback within the learning process	D3
A respectful attitude towards others and oneself throughout the learning process	D4
Self-evaluation concerning subject learning progress	D5

## Contents

Topic	
1. Basic Concepts of Financial Mathematics	1.1. The value of Money 1.2. Types of Time and Interest 1.3. Equations of Value 1.4. Principles
2. Capitalization: Simple Interest and Compound Interest	2.1. Simple Interest 2.1.1. Present Value Formula 2.1.2. Future Value Formula 2.2. Compound Interest 2.2.1. Present Value Formula 2.2.2. Future Value Formula 2.3. Nominal Rates and Effective Interest 2.4. Comparing Simple and Compound Interest
3. Discount Interest	3.1. Discount Interest Basic Formulas 3.2. Comparing Simple and Discount Interest 3.3. Discounting Negotiable Instruments
4. Annuities	4.1. Ordinary Annuities or Annuity immediate 4.1.1. The Future Value of an Ordinary Annuity 4.1.2. The Present Value of an Ordinary Annuity 4.2. Annuity due 4.3. Deferred Annuities 4.4. Forborne Annuities 4.5. Perpetuities
5. Amortization of Debts	5.1. Methods of Amortization 5.2. Amortizations Schedule 5.3. Outstanding Balance 5.4. Refinancing Loans
6. Constitution of Capital	6.1. Methods of a Savings Program 6.2. Types of Constitution 6.3. Constitution Schedule
7. Cost and Return on Financial Transactions	7.1. Simple Financial Transactions 7.2. Complex Financial Transactions

## Planning

	Class hours	Hours outside the classroom	Total hours
Master Session	22	0	22
Troubleshooting and / or exercises	24	0	24
Group tutoring	4	15	19
Others	0	22	22
Short answer tests	3	10	13

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

	Description
Master Session	The teacher explains the most relevant and difficult conceptual subject matter in the classroom. Examples are chosen to clarify concepts. 15 sessions, 90 minutes per session. Attendance required
Troubleshooting and / or exercises	In the practical sessions, students are offered a set of exercises and several cases. The teacher will guide the students through the exercises to solve the problems after a brief debate in class. Students are additionally offered a set of exercises to solve on their own. This forms part of the on-going evaluation of the student. 9 sessions, 150 minutes per session. Attendance required

Group tutoring	<p>Two tutorials are held in small groups:</p> <p>Tutorial I, at about mid-course, aims:</p> <p>a) To carry out a general review of the first part of the program and address pending doubts.</p> <p>b) To follow up on the knowledge and skill acquired in the practice of the first part of the syllabus through a basic level written test.</p> <p>This forms part of the on-going evaluation of the student.</p> <p>1 session, 150 minutes.</p> <p>Attendance required</p> <p>Tutorial II, at the end of the course, aims:</p> <p>a) To carry out a general review of the second part of the program and address pending doubts.</p> <p>b) To follow up on the knowledge and skill acquired in the practice of the second part of the syllabus through a basic level written test.</p> <p>1 session, 150 minutes.</p> <p>Attendance required</p>
Others	<p>Online course called Virtu@I MOF, a digital resource for collaborative learning.</p> <p>The student has an online course specifically designed to encourage their learning process following the subject programme and the paced rhythm of the classroom.</p> <p>It includes the lessons of the programme in digital format and pdf format for printing, with learning objectives, self-assessments, examples of each concept, glossaries, practice statement, suggested activities and recommended links and bibliography. In addition, at the end of each teaching unit, the student may check the level of progress achieved in each lesson by taking a self-assessment test, with personalized feedback.</p> <p>Other didactic resources, such as exams from other academic years, are also included.</p> <p>Virtual Classroom</p>

### Personalized attention

Methodologies	Description
Master Session	Students can see the teacher for individual tutoring within the established schedule. They may receive additional personalized feedback on the progress achieved in each of the lessons by working on the exercises suggested in Virtu@I MOF, the classroom platform.
Troubleshooting and / or exercises	Students can see the teacher for individual tutoring within the established schedule. They may receive additional personalized feedback on the progress achieved in each of the lessons by working on the exercises suggested in Virtu@I MOF, the classroom platform.

### Assessment

	Description	Qualification	Training and Learning Results		
Troubleshooting and / or exercises	On-going evaluation mark Maximum 10 points	30	B1 B2 B3 B13	C7 C9 C12 C16	D3 D4 D5
Short answer tests	Final exam mark Maximum 10 points  This is a written test, taken on site on the official calendar date, that evaluates the acquisition of theoretical competences, practical skills in applying financial logic to new situations. This is assessed at three levels: basic, intermediate and advanced.	70	B1 B2	C7 C9 C12 C13	

### Other comments on the Evaluation

The teacher informs the students about everything related to on-going assessment on the first day of the course. The student is provided with a week by week planned learning schedule.

The teacher also presents the online course specifically designed for learning Financial Mathematics. This online course follows the syllabus and the real-time progress of the lessons.

The students' on-going evaluation mark is kept exclusively in the academic year in which it is obtained.

### Sources of information

#### Basic Bibliography

Rodríguez Sánchez, J. A. y Rodríguez Parada, S. M., **MOF Virtu@I: un recurso para el aprendizaje colaborativo**, 2017

Pablo López, A. de, **Matemática de las operaciones financieras I y II**, 2000

Pablo López, A. de, **Manual práctico de Matemática comercial y financiera. Tomos I y II.**, 2001

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**Complementary Bibliography**

Guthrie, G. L. & Lemon, L. D., **Mathematics of Interest Rate and Finance**, 2004

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**Recommendations**

**Subjects that continue the syllabus**

Investment decisions/V03G020V01402

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**Other comments**

This subject in the double degree in Business Administration and Management/Law School is taught in the 1st quarter of the 2nd year.

Sonia M. Rodríguez Parada is the Coordinating Professor.