

TEACHING GUIDE
FINANCIAL MATHEMATICS

GRADO EN ECONOMÍA (INGLÉS)

ACADEMIC YEAR 2023-24

Date: 11-07-2023

I.-Subject Identification	
Type	OBLIGATORIA
Teaching period	3 course, 1Q semester
Nº of credits	6
Language in wich the subject is taught	English

II.-Presentation
<p>The general objective of this subject is to learn how to correctly apply the mathematical principles relating to the variation of the value of money over time. To this end, the aim is to provide students with the necessary mathematical knowledge to enable them to learn the fundamentals of Financial Mathematics, as well as a first approach to the study of the most common financial operations, the analysis and description of the essential aspects of the most relevant financial operations, and the understanding of the operation of the products and services of the current banking and stock markets. In this way, the student will be able to interpret correctly from a financial point of view the information extracted from the resolution of the problems of Financial Mathematics. To this purpose, the precise theoretical foundations will be established, which will be applied in the resolution of problems through practical cases. Previous knowledge of mathematics is required.</p>

III.-Competences
<p>Generic competences</p> <p>CT01. Ability to analyse and synthesise CT05. Knowledge of information systems relating to the field of study CT07. Ability to solve problems CT08. Ability to make decisions CT15. Ability to learn independently CB02 . That students are able to apply their knowledge to their work or vocation in a professional manner and have the skills that are typically demonstrated through the preparation and defense of arguments and problem solving within their field of study. CB03 . That students have the ability to gather and interpret relevant data (usually within their field of study) to express judgments that include a reflection on relevant topics related to social, scientific or ethical areas. CB04 . That students are able to transmit information, ideas, problems and solutions to both specialized and non-specialized audience. CB05 . That students have developed the learning skills needed to undertake further studies with a considerable degree of autonomy.</p>
<p>Specific competences</p> <p>CE01. Ability to put knowledge of economics into practice CE12. Understanding and evaluating financial investment CE14. Ability to convert an empirical problem into an area of research and reach conclusions</p>

IV.-Contents		
IV.A.-Syllabus		
Contents	Units	Sections
I.- "Basic Topics. Simple Financial Operations."	Unit 1. "Fundamentals of Financial Mathematics"	1.1. Introduction to Financial Calculus 1.2. The Time Value of Money 1.3. Financial Capital 1.4. Financial Operation 1.5. Classification of Operations 1.6. Theoretical Concepts
	Unit 2. "Financial Laws"	2.1 Concepts and Properties of Financial Laws 2.2. Financial Laws Classification 2.3 Magnitudes related to Financial Laws
	Unit 3. "Capitalization Operations: Simple and Compound Interest Regime"	3.1. Simple Interest. Characteristics and Properties 3.2. Compound Interest. Characteristics and Properties 2.3. Commercial Characteristics of Capitalization Operations
	Unit 4. "Discount Operations: Simple and Compound Discount Regime"	4.1. Simple Discount. Characteristics and Properties 4.2. Compound Discount. Characteristics and Properties 4.3. Commercial Characteristics of Discount Interest
II.- "Annuities"	Unit 5. "Annuities Valuation"	5.1. Annuity Concept. 5.2. Financial Value of an Annuity 5.3. Financial Annuities Classification 5.4. Ordinary Annuity and Annuity Due
	Unit 6. "Compound Financial Operations "	6.1. Compound Financial Operation Concept. 6.2. Financial Equivalence 6.3. Compound Financial Operations Classifications 6.4. Methods of Calculation of Mathematical Reserves: Retrospective, Recurrent and Prospective 6.5. Decision Criteria. NPV and IRR.
III.- "Paid off Systems. Loans"	Unit 7. "Loans "	7.1. Loan Definition. 7.2. Loan Magnitudes 7.3. Loan Tables and Paid off Systems 7.4. Loan Dynamic Scheme

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	Unit 8. "Loan Repayment and Settlement Systems"	8.1. Classification of Loan Repayment and Settlement Systems 8.2 French Loan 8.3. American Loan 8.4. Constant Principal Repayments (Italian Loan) 8.5. Geometric Loans 8.6 Other Repayment and Settlement Systems
	Unit 9. "Spanish Public Debt Market"	9.1. Spanish Public Treasury 9.2. Treasury Bills and Bonds

IV.B.-Training activities	
Type	Title
Practical / resolution of exercises	Problem Solving: Contents I, II, and III

V.-Student workload		
Lecture classes		15
Practical classes/resolution of exercises, case studies, etc.		40
Practical sessions in technological laboratories, hospitals, etc.		0
Tests		5
Academic tutorials		18
Related activities: conferences, seminars, etc.		0
Preparation of lecture classes		20
Preparation of practices, exercises, cases studies work		40
Test preparation		42
Total student workload		180
VI.-Methodology and academic programme		
Type	Period	Content
Other activities	Week 1 to Week 1	Presentation of the course, the teaching guide, and the course syllabus.
Master classes	Week 1 to Week 11	Lessons 1-9 The development of the theory of the different topics
Work placements	Week 1 to Week 15	Lessons 1-9 The course will have an eminently practical content, including the inclusion of many and varied financial problems to be developed throughout the course on a regular basis.
Other activities	Week 3 to Week 14	Possibility of practical workshops through virtual classroom

VII.-Assessment methods

VII.A.-Assessment weighting

Continuous ordinary assessment:

The distribution and characteristics of the assessment tests are those described below. Only in exceptional case and for special reasons may the teacher add changes to the Guide. These changes will require the prior consultation with the Subject Head and the prior and explicit authorisation of the Degree Programme Coordinator, who will notify the Vice-Rector's office in charge of Academic Affairs of the modifications made. In any case, the changes proposed must take into account the stipulations of the verified report. In order for these changes to take effect, they must be duly communicated at the start of the course to the students using Aula Virtual.

The combination of activities that are not re-assessable cannot exceed 50% of the subject grade and, in general, cannot have a minimum grade (except for the case of laboratory or clinical work placements, where duly justified), and tests which exceed 60% of the subject weighting cannot be added.

Extraordinary assessment: Students who do not manage to pass the ordinary assessment, or who did not attend, will be subject to completion of an extraordinary assessment to verify their acquisition of the skills established in the guide, only for activities that are re-assessable.

Description of the tests for assessment and their weights.

The regular evaluation process is specified in the following table:

Evaluation System	Percentage	Period	Content	Venue
Theoretical and practical test	20%	Throughout the teaching period on the date indicated by the lecturer who teaches the subject.	Parts I, II and III	The exam Will take place in the classroom.
Problem solving	30%	Throughout the teaching period on the date indicated by the lecturer who teaches the subject.	Parts I and II	The exam Will take place in the classroom.
Problem solving	50%	Throughout the teaching period on the date indicated by the lecturer who teaches the subject.	Parts II and III	The exam Will take place in the classroom.

The minimum score to pass the subject is 5 points out 10. The second chance test will be exclusively for the students who did not pass the ordinary exam. The extraordinary assessment will be carried out with a similar test to the ordinary one.

*****IMPORTANT:** The date of the examination is an official one and is known well in advance, so once published on the web as final cannot be adapted to change that date or for specific students. The same approach is followed for the exam reviews. The examination reviews shall take place on a date between the date on which the examination is held, and the closing date set by the University for each academic year. The review will take place on a single day, which will be announced in advance together with the publication of the provisional grades, informing the student at least 48 hours in advance. The student will always be informed at least 48 hours in advance. No individual reviews will be held for any student outside the established dates. For the purposes of the review, no personal, family or academic circumstances justify the passing of the subject if the marks obtained show otherwise. If any student considers it appropriate for the teacher to consider any aspect that he/she considers important because it may affect the satisfactory completion of the subject, he/she must inform the student of this during the course and, in any case, always before the end of the classes.

In the early days of the course, the professor will detail the methodology to be followed during the course, tutorial hours, and more specific aspects of the evaluation. Besides, the tutorial hours schedule will be throughout the teaching period (from the first week of the course until the last week of class).

For the development of the classes, the professor will dictate specific rules on punctuality, participation, and few aspects deemed necessary to specify. The permanence of the student in the classroom is conditional upon them, as well as the rules of academic behavior published on the web

[http://www.urjc.es/alumnos/normativa/archivos/Normativa 20academica%% 20conducta 20URJC.pdf](http://www.urjc.es/alumnos/normativa/archivos/Normativa%20academica%%20conducta%20URJC.pdf)

If the professor believes that the minimum conditions are not met for the normal development of the class teacher stops the activity and informs the relevant body.

VII.B. Assessment of students with an academic exemption

Student who wish to opt for this assessment will have to get an academic exemption for the subject, which they will have to request from the Dean or Director of the Centre which teaches their course. An academic exemption may be granted where the subjects own characteristics allow for it.

Subject with the possibility of an exemption: Yes

VII.C. Review of assessment tests

In accordance with the exam appeal regulations of the Universidad Rey Juan Carlos.

VII.D.-Students with a disability or special educational needs

Curricular adaptations for students with a disability or special educational needs will be determined by the Disabled Students Support Department, in accordance with the regulations governing the Disabled Students Support service, approved by the Universidad Rey Juan Carlos Council, in order to guarantee equal opportunities, inclusive treatment, universal accessibility and a greater guarantee of academic success.

For this purpose, this Department will have to issue a curricular adaptation report, therefore students with disabilities or special educational needs must contact the Department to analyse the different alternatives together.

VII.E.-Academic behaviour, academic integrity and honesty

The Universidad Rey Juan Carlos is completely committed to the highest standards of academic integrity and honesty. Therefore, studying at the URJC means you accept and agree to the academic integrity and honesty values described in the University's Code of Ethics. In order to monitor this procedure, the University has Regulations on academic behaviour at the Universidad Rey Juan Carlos and uses different tools (anti-plagiarism, supervision?) which provides a collective assurance that these essential values are completely developed

VII.-Bibliography	
Reference Generic	
Ethics, Professional Standarts and Quantitative Methods; CFA Institute	
Principles of Finance with Excel; Simon Benninga (2006); Oxford University Press Inc (2006)	
Cálculo Financiero. Teoría y Ejercicios; Aparicio, A., et al. (2017); Thomson-Paraninfo, (3th Edition)	
Reference literature	
Matemática de las Operaciones Financieras; Bonilla, María; Ivars, Antonia y Moya, Ismael (2006); Thomson-Paraninfo	
Curso de Matemática Financiera; Miner, Javier (2008); Mc Graw Hill	
Websites of interest: www.tesoro.es www.bde.es www.excelavanzado.com Financial newspapers: www.eleconomista.es www.expansion.es www.cinco dias.es	

IX.-Lecturers/Teachers/Professors	
Lecturer/teacher/professor´s name	MARIA ELISA GARCIA ABAJO
E-mail address	mariaelisa.garcia@urjc.es
Department/field	Economía Financiera y Contabilidad
Category	Titular de Universidad interino
Academic qualifications	Doctor
Subject Coordinator	Yes
Academic tutorial timetable	Para consultar las tutorias póngase en contacto con el/la profesor/-a a través de correo electrónico
Nº of Quinquenios	3
Nº of Sexenio	0
Nº period for technology transfer	0
Stretch Docentia	4