



## Information about the subject

**Degree:** Bachelor of Science Degree in Business Administration and Management

**Faculty:** Faculty of Legal, Economic and Social Sciences

**Code:** 300205 **Name:** Mathematics of Financial Operations

**Credits:** 6,00 **ECTS Year:** 2 **Semester:** 1

**Module:** Finances

**Subject Matter:** Financial Management **Type:** Compulsory

**Department:** -

**Type of learning:** Classroom-based learning / Online

**Languages in which it is taught:** English, Spanish

### Lecturer/-s:

302A	<u>Sandra Alfonso Sargues</u> (Responsible Lecturer)	sandra.alfonso@ucv.es
314D	<u>Sandra Alfonso Sargues</u> (Responsible Lecturer)	sandra.alfonso@ucv.es
CAMC	<u>Sandra Alfonso Sargues</u> (Responsible Lecturer)	sandra.alfonso@ucv.es
30GI2	<u>Juan Isidro Escamez Marsilla</u> (English Responsible Lecturer)	ji.escamez@ucv.es
31GI4	<u>Juan Isidro Escamez Marsilla</u> (English Responsible Lecturer)	ji.escamez@ucv.es



## Module organization

### Finances

Subject Matter	ECTS	Subject	ECTS	Year/semester
Corporate Finance	18,00	Corporate Finance I	6,00	3/1
		Corporate Finance II	6,00	4/1
		Spanish Financial System	6,00	This elective is not offered in the academic year 23/24
Financial Management	24,00	Mathematics of Financial Operations	6,00	2/1
		Negotiation with Financial Institutions	6,00	This elective is not offered in the academic year 23/24
		Planning and Financial Control	6,00	4/1
		Stock Exchange and Securities Markets	6,00	4/2

## Recommended knowledge

The Finance module subjects are distributed throughout the curriculum of the Bachelor in Economic and Financial Management GADE localized in courses 2, 3, and 4. This achieves a progressive development of the contents, with which students can safely deal with all aspects of an enterprise and its relationship with the environment



## Learning outcomes

At the end of the course, the student must be able to prove that he/she has acquired the following learning outcomes:

- R1 Choose from different investment alternatives those that maximize business value.
- R2 Choose the financial resources efficiently.
- R3 Combine the financial resources to maximize the value of the company.
- R4 Valuing financial assets.
- R5 Write reviews and clear and accurate reports.
- R6 Learn and develop techniques for bank negotiation.



## Competencies

Depending on the learning outcomes, the competencies to which the subject contributes are (please score from 1 to 4, being 4 the highest score):

BASIC		Weighting			
		1	2	3	4
CB2	That students know how to apply their knowledge to their work or vocation in a professional way and possess the skills that are usually demonstrated through the elaboration and defense of arguments and the resolution of problems within their area of study.	X			

GENERAL		Weighting			
		1	2	3	4
CG1	Capacity of analysis and synthesis.	X			
CG2	Adequate management of time and resources.	X			
CG3	Capacity to apply knowledge into practice.				X
CG4	Capacity to handle information from different sources.	X			
CG7	Information management.		X		
CG9	Decision-making orientation.			X	
CG16	Self-confidence and decision making.	X			

SPECIFIC		Weighting			
		1	2	3	4
CE15	Ability to obtain, from the data, valuable information for decision making.				X



CE17 Application of professional criteria to the analysis of business problems.

x



## Assessment system for the acquisition of competencies and grading system

### In-class teaching

Assessed learning outcomes	Granted percentage	Assessment method
R1, R2, R3, R4, R5, R6	15,00%	Objective Tests
R1, R2, R3, R4, R5, R6	25,00%	Conduct of Theory-Practice
R1, R2, R3, R4, R5, R6	10,00%	Class attendance and participation
R1, R2, R3, R4, R5, R6	50,00%	Final Exam

### Observations

In order to measure the acquisition of skills for the course through the Learning Outcomes defined above, the evaluation system is as follows. 4 tests will be conducted throughout the course, which account for 40% of the final grade and that include objective tests (15%) and theoretical-practical activities (25%), on the following dates:

Assessment 1: Fundamentals and classic financial laws. Early October

Assessment 2: Classic Financial laws, financial reserves, cost and performance. late October

Assessment 3: Study of rents. mid November

Assessment 4: Repayment of loans. Early December

Additionally, the papers and their presentation, as well as reports and reporting practices to develop students are evaluated. Attendance and active participation in the discussions and technical discussions are also under evaluation, as well as participation in group dynamics conducted throughout the semester. The final written exam a written test used in several practical exercises. Assessments that have not been realized or passed can be remade after the first term, before the second term, as in accordance with the teacher guidelines.

Regarding the evaluation system for the second call, the student who has not completed or passed the assessment tests and classroom work required for the first call, must perform a final exam of greater amplitude in which case the qualification obtained will be 100% of your final grade

### Online teaching

Assessed learning outcomes	Granted percentage	Assessment method
R1	5,00%	Attendance and participation in the activities of synchronous communication
R1, R2, R4, R5	25,00%	Conduct of deliverables



R1, R2, R3, R4	15,00%	Regular evaluations through online questionnaires.
R2, R6	5,00%	Participation in discussion forums
R1, R2, R3, R4, R5	50,00%	Final on-site assessment.

## Observations

The deliverable activities of the course will be grouped into 4 Continuous Assessment Activities (AE), which must be delivered and obtain a grade higher than 5, so that the final face-to-face exam of the course will also meet the objective of the validation instrument of the marks obtained in distance activities. Logically, in any case it will be necessary to pass the final exam of the subject

## MENTION OF DISTINCTION:

According to Article 22 of the Regulations governing the Evaluation and Qualification of UCV Courses, the mention of "Distinction of Honor" may be awarded by the professor responsible for the course to students who have obtained, at least, the qualification of 9 over 10 ("Sobresaliente"). The number of "Distinction of Honor" mentions that may be awarded may not exceed five percent of the number of students included in the same official record, unless this number is lower than 20, in which case only one "Distinction of Honor" may be awarded.

## Learning activities

The following methodologies will be used so that the students can achieve the learning outcomes of the subject:

- M1 Problem solving, commentaries, summaries to hand in periodically.
- M3 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
- M5 Group work sessions supervised by the professor. Case studies, diagnostic tests, problems, field work, computer room, visits, data search, libraries, on-line, Internet, etc. Meaningful construction of knowledge through interaction and student activity.
- M7 Supervised monographic sessions with shared participation.
- M9 Application of multidisciplinary knowledge.



- M11 Personalized and small group attention. Period of instruction and / or orientation conducted by a tutor with the objective of reviewing and discussing the materials and topics presented in classes, seminars, readings, conducting work, etc.
- M13 Set of oral and/or written tests used in initial, formative or additive assessment of the student.
- M14 Student study: Group Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.
- M16 Group preparation of readings, essays, problem solving, seminars, papers, reports, etc. to be presented or submitted in theoretical lectures, practical and/or small-group tutoring sessions.
- M17 Teacher presentation of contents, analysis of competences, explanation and in-class display of skills, abilities and knowledge.
- M19 Groupwork sessions in the chat under supervision of the lecturer. Analysis of economic and business case studies, both real and fictitious, in order to build knowledge through the student's interaction and activity. Critical analysis of values and social commitment.
- M21 Monographic sessions though the semester, which will be aimed at current aspects and applications of the subject.
- M23 Set of written or oral tests used for the initial, formative or cumulative assessment of the student.
- M25 Student study: Individual preparation of readings, essays, problem solving, seminars, papers, reports, etc., for their discussion or submission in electronic format.
- M27 Individual support for the monitoring and orientation of the learning process. It will be carried out by a lecturer and will pursue the revision and discussion of the materials, topics, readings, tasks, etc.
- M29 Group preparation of readings, essays, problem solving, seminars, papers, reports, etc., for their discussion or submission.
- M31 Participation in discussion forums related to the subject under the supervision of the lecturer.





## IN-CLASS LEARNING

### IN-CLASS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
On-campus Class M3	R1, R2, R3, R4, R5, R6	22,50	0,90
Practical Class M5	R1, R2, R3, R4, R5, R6	15,00	0,60
Seminar M7	R1, R2, R3	4,50	0,18
Group Presentation of Papers M16	R1, R2, R3, R4, R5, R6	6,00	0,24
Office Assistance M11	R1, R2, R3, R4, R5, R6	6,00	0,24
Assessment M13	R1, R2, R3, R4, R5, R6	6,00	0,24
<b>TOTAL</b>		<b>60,00</b>	<b>2,40</b>

### LEARNING ACTIVITIES OF AUTONOMOUS WORK

	LEARNING OUTCOMES	HOURS	ECTS
Group Work M16	R1, R2, R3, R4, R5, R6	30,00	1,20
Independent Work M14	R1, R2, R3, R4, R5, R6	60,00	2,40
<b>TOTAL</b>		<b>90,00</b>	<b>3,60</b>



## ON-LINE LEARNING

### SYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Synchronous Virtual Session M17	R1, R2, R3, R4, R5, R6	4,00	0,16
Synchronous Virtual Practical Session M19	R1, R2, R3, R4, R5, R6	4,00	0,16
Seminar and Synchronous Virtual Videoconference M21	R1, R2, R3, R4, R6	4,00	0,16
On-site or Synchronous Virtual Assesment M13	R1, R2, R3, R4, R5, R6	3,00	0,12
<b>TOTAL</b>		<b>15,00</b>	<b>0,60</b>

### ASYNCHRONOUS LEARNING ACTIVITIES

	LEARNING OUTCOMES	HOURS	ECTS
Individual Work M25	R1, R2, R3, R4, R5, R6	60,00	2,40
Tutorial Support Sessions M27	R1, R2, R3, R4, R5, R6	5,00	0,20
Group Work M29	R1, R2, R3, R4, R5, R6	10,00	0,40
Discussion Forum M31	R1, R2, R3, R4, R5, R6	10,00	0,40
Continuous Assessment Tasks M1	R1, R2, R3, R4, R5, R6	50,00	2,00
<b>TOTAL</b>		<b>135,00</b>	<b>5,40</b>



## Description of the contents

Description of the necessary contents to acquire the learning outcomes.

### Theoretical contents:

Content block	Contents
BLOQUE I. FUNDAMENTALS FINANCIAL CAPITAL.	<ul style="list-style-type: none"><li>- Financial equivalence</li><li>- Classical Financial laws : Compounding and discounting.</li></ul>
BLOQUE II. FINANCIAL OPERATIONS.	<ul style="list-style-type: none"><li>- Concept.</li><li>- Book.</li><li>- Cost and performance.</li></ul>
BLOQUE III. RANTING RENTS	Ranting Rents
BLOQUE IV. OPERATIONS AMORTIZATION OF CAPITAL	Operations amortization of capital
BLOQUE V: OPERATIONS RAISING CAPITAL	Operations raising capital



## Temporary organization of learning:

Block of content	Number of sessions	Hours
BLOQUE I. FUNDAMENTALS FINANCIAL CAPITAL.	10,00	20,00
BLOQUE II. FINANCIAL OPERATIONS.	6,00	12,00
BLOQUE III. RANTING RENTS	6,00	12,00
BLOQUE IV. OPERATIONS AMORTIZATION OF CAPITAL	4,00	8,00
BLOQUE V: OPERATIONS RAISING CAPITAL	4,00	8,00



## References

### Basic Bibliography

BONILLA, M, IVARS, A. y MOYA, I. (2006): *Matemática de las operaciones financieras*. Editorial: Thomson

DE LA FUENTE & PRA, I.(2020) *Matemáticas de las operaciones financieras*. Editorial Universitaria Ramón Areces.

DE LA FUENTE & PRA, I.(2020) *Ejercicios de Matemáticas de las operaciones financieras*. Editorial Universitaria Ramón Areces.

DE PABLO, A (1998): *Matemáticas de las operaciones financieras I y II*. Madrid: UNED.

VALLS, M. y CRUZ, S. (2004): *Introducción a las matemáticas financieras*. Pirámide

### Complementary Bibliography

ALHABEEB, M. J. (2012). *Mathematical Finance*. John Wiley & Sons, New Jersey.

BAQUERO M. y MAESTRO, M. (2003): *Problemas resueltos de matemáticas de las operaciones financieras*. Thomson

BROWN, R.; ZIMA, P. & KOPP, S. (2011): *Mathematics of Finance*. McGraw-Hill Ryerson, New York.

CABELLO, J. et al. (2002): *Matemáticas financieras aplicadas*. Editorial AC.

GARCIA, J. (2011). *Matemáticas Financieras*. Ed. PIRÁMIDE.

GARCÍA, J. et al. (2002) *Problemas resueltos de matemática de las operaciones financieras*. Pirámide.

GONZÁLEZ CATALÁ, V. (1995): *Análisis de las Operaciones Financieras Bancarias y Bursátiles*. Madrid: Ediciones de las Ciencias Sociales, S.A.

LUDERER, B. (2020) *Classical Financial Mathematics: Basic Ideas, Central Formulas and Terms at a Glance*. Springer, Wiesbaden

MARQUÉS FERNÁNDEZ-FLORES, J.R. (1996): *Créditos y Préstamos*. Madrid: Pirámide.

MENEU, V.; JORDÁ, M. Y BARREIRA, T (1994): *Operaciones financieras en el mercado español*. Madrid: Ariel.

NAVARRO, E. (2019) *Matemáticas de las operaciones financieras (Economía y Empresa)*. Ediciones Piramide

RÍO BÁRCENA, J. (1997): *Los productos bancarios I y II*. Madrid: Pirámide. SANTANDREU, P. (2002): *Matemática Financiera*, Barcelona: Ediciones Gestión 2000

TOVAR, J. (2011). *Operaciones financieras. Teoría y problemas resueltos*. Ed. CEF, Madrid.

VILLALOBOS, J. (2001) *Matemáticas financieras*. Mc Graw Hill.



## Addendum to the Course Guide of the Subject

Due to the exceptional situation caused by the health crisis of the COVID-19 and taking into account the security measures related to the development of the educational activity in the Higher Education Institution teaching area, the following changes have been made in the guide of the subject to ensure that Students achieve their learning outcomes of the Subject.

**Situation 1: Teaching without limited capacity** (when the number of enrolled students is lower than the allowed capacity in classroom, according to the security measures taken).

In this case, no changes are made in the guide of the subject.

**Situation 2: Teaching with limited capacity** (when the number of enrolled students is higher than the allowed capacity in classroom, according to the security measures taken).

In this case, the following changes are made:

### 1. Educational Activities of Onsite Work:

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject will be made through a simultaneous teaching method combining onsite teaching in the classroom and synchronous online teaching. Students will be able to attend classes onsite or to attend them online through the telematic tools provided by the university (videoconferences). In any case, students who attend classes onsite and who attend them by videoconference will rotate periodically.

In the particular case of this subject, these videoconferences will be made through:

☒ Microsoft Teams

☐ Kaltura



## **Situation 3: Confinement due to a new State of Alarm.**

In this case, the following changes are made:

### **1. Educational Activities of Onsite Work:**

All the foreseen activities to be developed in the classroom as indicated in this field of the guide of the subject, as well as the group and personalized tutoring, will be done with the telematic tools provided by the University, through:

☒ Microsoft Teams

☒ Kaltura

Explanation about the practical sessions:



## 2. System for Assessing the Acquisition of the competences and Assessment System

### ONSITE WORK

#### Regarding the Assessment Tools:

☒ The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.

☐ The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

#### Comments to the Assessment System:





## ONLINE WORK

### Regarding the Assessment Tools:

- ☒ The Assessment Tools will not be modified. If onsite assessment is not possible, it will be done online through the UCVnet Campus.
- ☐ The following changes will be made to adapt the subject's assessment to the online teaching.

Course guide		Adaptation	
Assessment tool	Allocated percentage	Description of the suggested changes	Platform to be used

The other Assessment Tools will not be modified with regards to what is indicated in the Course Guide.

### Comments to the Assessment System: