



Matemáticas  
Financieras /  
Financial  
Mathematics  
**Grado en Creación  
Administración y  
Dirección de Empresas**



UNIVERSIDAD  
**NEBRIJA**

## SYLLABUS

**Course:** Matemáticas Financieras / Financial Mathematics

**Degree:** Grado en Creación Administración y Dirección de Empresas

**Type:** Core

**Language:** Castellano / English

**Modality:** In person / online

**Credits:** 6

**Year:** 1º

**Semester:** 2º

**Professors:** García-Donas Guerrero, Raquel; López Gallego, Julián

### 1. COMPETENCES AND LEARNING OUTCOMES

#### 1.1. Competences

Basic competences: CB1, CB2, CB3, CB4, CB5

General competences: CG1, CG2, CG5, CG6, CG11, CG12, CG13, CG14, CG15, CG16, CG17, CG19

Specific competences: CE8, CE9, CE18, CE21, CE22, CE23, CE24

#### 1.2. Learning outcomes

- Understand financial laws and how to operate with them by learning how to make financial decisions.
- Know how to calculate the present and final values of Financial Returns
- Understand and obtain the components of loan repayment schedules
- Estimate the creation or destruction of value derived from investment decisions

### 2. CONTENTS

#### 2.1. Prerequisites

None

#### 2.2. Description

Técnicas de análisis cuantitativo y cálculo financiero como herramienta básica para analizar las distintas opciones de financiación e inversión: capitalización simple y compuesta, rentas, préstamos, valoración de, proyectos de inversión, etc.

Techniques of quantitative analysis and financial calculation as a basic tool to analyze the different options of financing and investment: simple and compound capitalization, rents, loans, valuation of, investment projects, etc.

### 2.3. Covered topics

1. Módulo 1: Essential statements
  - a. Financial capital. Financial agreement. Financial equivalence.
  - b. Financial laws. Derivative magnitudes.
2. Módulo 2: Capitalisation and discount laws
  - a. Simple capitalisation law.
  - b. Compound capitalisation law.
  - c. Comparison between capitalisation laws. Equivalent capitalisation rates.
  - d. Commercial simple discount law.
  - e. Rational simple discount law.
  - f. Compound discount law.
3. Módulo 3: Rents
  - a. Meaning of rent. Unit, temporary and prepaid rents.
  - b. Unit, temporary and postpaid rents.
  - c. Comparison between prepaid and payable rents. Perpetual rents or annuities.
  - d. Arithmetic progression rents.
  - e. Geometric progression rents.
  - f. Fractional rents.

[Midterm exam]

4. Módulo 4: Loans
  - a. Meaning of loan. General formulation of a loan.
  - b. Amortisation schedule.
  - c. Simple loan. American system.
  - d. Linear system.
  - e. French system.
  - f. Loans with variable rate.
5. Módulo 5: Firm valuation
  - a. Investment firm valuation.
  - b. Gross Profit. Gross profitability pattern. Annual average profitability.
  - c. Pay-back.
  - d. Net Present Value.
  - e. Internal Rate of Return.

### 2.4. Individual / Group assignments

Assignments, tasks, reports or other projects may be developed for the whole semester.

After the end of both *Capitalisation and Yield* and *Loans and Valuation* modules, exercises or problems will be requested via Blackboard platform.

## 2.5. Learning activities

<b>Learning Activities:</b>		
<b>Type of in person activity</b>	<b>Horas</b>	<b>Presencialidad %</b>
A1 Masterclass/Theoretical Foundations	45	100%
A2 Practical classes. Seminars and workshops	9	100%
A3 Tutoring	9	100%
A4 Student work or exercises	18	0%
A5 Activities through virtual resources	6	50%
A6 Access and research on complementary content	6	0%
A7 Individual study	51	0%
A13 Evaluation	6	100%
<b>Type of online activity</b>	<b>Horas</b>	<b>Presencialidad %</b>
A9 Asynchronous classes	12	0%
A10 Practical classes. Synchronous or asynchronous.	12	0%
A3 Tutoring	24	0%
A4 Student work or exercises	18	0%
A5 Activities through virtual resources	12	0%
A6 Access and research on complementary content	12	0%
A7 Individual study	54	0%
A13 Evaluation	6	100%
<b>Methodology:</b>		
<b>In person:</b> MD1, MD2, MD3, MD4, MD5		
<b>Online:</b> MD1, MD2, MD3, MD4, MD5		

## 3. EVALUATION SYSTEM

### 3.1. Grading system

The final grading system shall be expressed numerically as follows:

- 0 - 4,9 Failure (SS)
- 5,0 - 6,9 Passed (AP)
- 7,0 - 8,9 Notable (NT)
- 9,0 - 10 Outstanding (SB)

The mention of "matrícula de honor" may be awarded to students who have obtained a grade equal to or higher than 9.0.

### 3.2. Evaluation criteria

#### Ordinary call

Modality: In person

Sistemas de evaluación	Percentage
Evaluation system	10%
S1 Class attendance and participation	30%
S2 Presentation of work and projects (Individual and team work)	10%
S3 Partial test in person (written/presentation of work)	50%

S4 Final exam or final work in person	
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Modality: Online

Evaluation system	Percentage
S10 Participation in forums and tutored activities	10%
S2 Presentation of work and projects (Individual and team work)	30%
S4 Final exam or final work in person	60%

Extraordinary call

Modality: In person

Evaluation system	Porcentaje
S2 Presentation of work and projects (Individual and team work)	30%
S4 Final exam or final work in person	70%

Modality: Online

Evaluation system	Porcentaje
S2 Presentation of work and projects (Individual and team work)	30%
S4 Final exam or final work in person	70%

Restrictions and explanation of weighting: In order to be able to average the above weightings, it will be necessary to obtain at least a mark of 5 in the final exam.

Likewise, it will be the teacher's discretion to request and re-evaluate the practicals or written assignments, if these have not been handed in on time, have not been passed or if the student wishes to improve the mark obtained in both exams.

In any case, the passing of any subject/subject is subject to passing the corresponding final face-to-face and individual tests.

### 3.3. Restrictions

#### Minimum Grade

To be able to qualify for inclusion of the above evaluation criteria percentages in the calculation of the final grade, it is necessary to obtain at least a grade of 5.0 in the final test.

#### Attendance

Student who have missed more than 25% class meetings (unexcused) may be denied the right to take the final exam in the ordinary session.

#### Writing Standards

Special attention will be given to written assignments, as well as to exams, regarding both presentation and content in terms of grammatical and spelling aspects. Failure to meet the minimum acceptable standards may result in point deduction.

### 3.4. Plagiarism warning

Nebrija University will not tolerate plagiarism under any circumstances. Reproducing content from sources other than a student's own work (the internet, books, articles, and peers' work, among others) without proper citation will be considered plagiarism.

If these practices are detected, they will be considered a serious offense, and the sanctions provided for in the Student Regulations may be applied.

#### 4. BIBLIOGRAPHY

##### Requested reading

Garret, S. (2015). Introduction to Actuarial and Financial Mathematical Methods. Elsevier.  
Navarro, E. (2019). Matemáticas de las operaciones financieras. Pirámide.

##### Recommended reading

Aparicio, A., Gallego, R., Ibarra, A. y Monroel, J.R., (2000). Cálculo financiero. Teoría y Ejercicios. Paraninfo.  
Baquero, M y Maestro, M. L. (2003). Problemas Resueltos de Matemática de las Operaciones Financieras. Thomson.  
Miner, J., (2005). Matemática Financiera. MC Graw Hill.  
Tovar, J. (2001). Operaciones Financieras (Teoría y Problemas Resueltos). Editorial Centro de Estudios Financieros.  
Valls, M. C. y Cruz, S. (2009). Introducción a las Matemáticas Financieras. Problemas Resueltos. Pirámide.