

**BACHELOR'S DEGREE IN BUSINESS ADMINISTRATION
FIRST YEAR 2013-2014**

Course Title	Business Mathematics II	Code	802269
Module	Basic Instruction	Area	Mathematics
Type	Basic Instruction		
ECTS Credits	6	Attending	3
		Not-attending	3
Year	First	Semester	Second

PROFESSORS, GROUPS AND TIMETABLES

Department	Economía Financiera y Contabilidad I		
Coordinator	E-mail	Office	Tutorials
Blanco García, Susana	susanablanca@ccee.ucm.es	207, Pab. 5º	
Professors			
Balbás Aparicio, Raquel	raquel.balbas@ccee.ucm.es	214, Pab 5º	

Professors	Groups	Timetable
Balbás Aparicio, Raquel	E	Thursdays:13.00-15:00 Fridays:15:00-17.00 SEMINARS: Every two weeks

SHORT DESCRIPTOR
Typical content on Mathematical Analysis and Calculus. Optimization of multi-variable functions.
PREVIOUS KNOWLEDGE
Background in mathematics with the level of a Secondary School.
MAIN OBJECTIVES
OBJECTIVES
To establish previous mathematical knowledge and progress in new concepts, methods and mathematical techniques with the aim of applying mathematical reasoning to economic problems.
COMPETENCES
General: CG1,CG2,CG3 Cross-sectional: CT1,CT4,CT5 Specific: CE1,CE3,CE4
CONTENTS

1. Linear Algebra.

- Vectors. Vectorial spaces.
- Specific vectorial space concepts.
- Vectorial subspaces.
- Linear transformations.
- Eigenvalues, eigenvectors and diagonalization.
- Sign of a quadratic form.

2. Multi-variable calculus.

- Multiple-variable functions: Level curves.
- Partial derivatives: gradients and Hessians.
- Differentiating compounded functions.
- Implicit function theory. Differentiating implicit functions.
- Homogeneous functions: Euler's Theorem.

3. Multi-variable functions: Integration Theory.

- Multi-integrals: Fubini's Theorem.
- Integrating in general domains.

4. Optimizing multi-variable functions.

- Unconstrained problems.
- Equality constraints: Lagrange multipliers.

TEACHING ACTIVITIES

Lectures	Percentage of the total ECTS credits	
Contents of the course, (20%).		
Practical Classes	Percentage of the total ECTS credits	
Solving exercises closely related to the theoretical approach, (20%).		
Other Activities	Percentage of the total ECTS credits	
Seminars: 5 % Attention to Students (Tutorship sessions): 5% Assessment Activities: 5% Preparation of projects: 20% Private study hours: 25 %		

ASSESSMENT

Exams	Percentage of the Final Grade	
Final Exam:	75 % of the final grade	
Other activities	Percentage of the Final Grade	
Continuous assessment, with participation in seminar sessions, resolution of practical exercises and resolution of worksheets and projects: 25% of the final grade.		

ASSESSMENT CRITERIA

Continuous assessment will take the form of exercises, practical work, attendance to seminars, personal attention and following up of the student, exams: 25 % of the final grade.
Final Exam: 75 % of the final grade.

The global grade will depend on the Spanish Law RD 1125/2003: There is a qualitative grade and a quantitative one. Both are closely related. The quantitative one will be lying within the spread 0-10 and may incorporate one decimal digit. The correspondence between their quantitative and the qualitative grades is the following:

- 0-4,9: Suspenso (SS)
- 5,0-6,9: Aprobado (AP)
- 7,0-8,9: Notable (NT)
- 9,0-10,0: Sobresaliente (SB)

Those students reaching a final grade higher than 9.0 could be awarded highest distinction: "Matrícula de Honor".

ORIENTATIVE SCHEDULE

FEBRUARY:

Week	Unit	Class work	Homework
	Linear Algebra.	<ul style="list-style-type: none">• Presentation of the subject• Exercises	<ul style="list-style-type: none">• Personal study of the theoretical contents.• Worksheet

MARCH:

Week	Unit	Class work	Homework
	Linear Algebra (II). Multi-variable calculus.	<ul style="list-style-type: none">• Exercises	<ul style="list-style-type: none">• Personal study of the theoretical contents.• Worksheet

MAY:

Week	Unit	Class work	Homework
	Multi-variable functions: Integration Theory.	<ul style="list-style-type: none">• Exercises	<ul style="list-style-type: none">• Personal study of the theoretical contents.• Worksheet

JUNE:

Week	Unit	Class work	Homework
	Optimizing multi-variable functions.	<ul style="list-style-type: none">• Exercises	<ul style="list-style-type: none">• Personal study of the theoretical contents.• Worksheet

RESOURCES

BIBLIOGRAFY

- Alpha C. Chiang: *Fundamental Methods of Mathematical Economics*, Mc. Graw-Hill.
- Martin Anthony and Norman Biggs: *Mathematics for Economics and Finance: Methods and Modelling*, Cambridge University Press.

OTHER IMPORTANT INFORMATION

Further information may be found in the Virtual Campus.