

SUBJECT TEACHING GUIDE

G355 - Mathematics for Economists

DOUBLE DEGREE IN ADMINISTRATION AND BUSINESS MANAGEMENT AND ECONOMICS Degree in Economics

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	DOUBLE DEGREE IN ADMINISTRATION AND BUSINESS MANAGEMENT AND ECONOMICS Degree in Economics			Type and Year	Compulsory. Year 1 Compulsory. Year 1
Faculty	Faculty of Economics and Business Studies				
Discipline	Subject Area: Mathematics for Economics Module: Training in Quantitative Methods				
Course unit title and code	G355 - Mathematics for Economists				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. ECONOMIA
Name of lecturer	MARIA HIERRO FRANCO
E-mail	maria.hierro@unican.es
Office	Edificio de las Facultades de Derecho y Ciencias Económicas y Empresariales. Planta: + 1. DESPACHO PDI (E155)
Other lecturers	XOSE LUIS FERNANDEZ LOPEZ

3.1 LEARNING OUTCOMES

- Understanding the concept and role of functions depending on multiple real variables in the economic analysis.
- The ability to apply optimization techniques appropriate to formalize and solve common problems of optimal allocation of scarce resources in the economic context.
- The ability to apply optimization techniques through specific software packages.

4. OBJECTIVES

To learn to specify and manipulate functions depending on multiple real variables.
To apply routine techniques of multivariable differential calculus suitable for economic applications.
To formulate common problems in economic analysis involving the allocation of scarce resources , as well as to apply the most adequate optimization technique to analitically solve the problem.
An adequate interpretation of the results obtained for the purpose of decision-making.

6. SUBJECT PROGRAM

CONTENTS	
1	Part I. Theory of functions of multiple real variables. 1. Introduction. 2. Differential calculus with several variables.
2	Part II. Introduction to optimization techniques. 3. Convexity. 4. Basic topis in optimization theory.
3	Part III. Classical, non-linear and linear optimization techniques. 5. Classical optimization problems. 6. Non-linear optimization problems. 7. Linear optimization problems.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Midterm exam 1.	Written exam	No	Yes	30,00
Laboratory exam.	Laboratory evaluation	No	Yes	10,00
Final exam.	Written exam	Yes	Yes	60,00
TOTAL				100,00

Observations

In case of an unforeseen change in sanitary conditions that did not allow on-site examination, the platform Moodle would be used for the virtual examination of students.
 For students who have completed but not passed the course in June, a recuperation exam will be provided in September consisting of a combination of practical issues and problems to be solved related the whole contents of the course.

Observations for part-time students

Students combining job and studies will be required to pass only a final exam in June that will count 100% of the final mark.
 In case of an unforeseen change in sanitary conditions that did not allowed to carry out on-site evaluation, student might choose between two options:
 1. To take part of continuous evaluation as all the students .
 2. To take a final exam in June, the grade being that obtained in the exam.
 In case of not passing the course successfully, the student will take a recuperation exam of all the contents of the course, the final grade being that obtained in the exam.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Balbás, A. y Gil, J.A. (1990). Programación matemática. Ed. AC, Madrid.

Barbollá, R., Cerdá, E. y Sanz, P. (1991). Optimización matemática: Teoría, ejemplos y contraejemplos. Ed. Espasa-Calpe, Madrid.

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Cobo, A. (1995). Optimización Matemática. Ed. Angel Cobo Ortega, Univ. de Cantabria.

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Mital, K.V. And Mohan, C. (2004). Optimization methods in operations research and system analysis. Ed. New International Publishers.

Miller, R.E. (2000). Optimization: Foundations and Applications. Ed. John Willey and Son.