



## IDENTIFYING DATA

### Mathematics: Mathematics

Subject	Mathematics: Mathematics			
Code	V03G020V01104			
Study programme	Grado en Administración y Dirección de Empresas			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	9	Basic education	1st	1st
Teaching language	#EnglishFriendly Spanish Galician			
Department				
Coordinator	Sanmartín Carbón, Esperanza Hervés Estévez, Javier			
Lecturers	Hervés Estévez, Javier Quinteiro Sandomingo, María del Carmen Sanmartín Carbón, Esperanza Vázquez Pampín, María del Carmen			
E-mail	esanmart@uvigo.es javiherves@uvigo.es			
Web				
General description	Familiarize the student with the basic mathematical tools for Economics. English Friendly subject: International students may request from the teachers: a) resources and bibliographic references in English, b) tutoring sessions in English, c) exams and assessments in English.			

## Training and Learning Results

Code	
B1	Ability to analyse and synthesise
B5	Oral and written communication skills.
B6	Communication skills through the Internet, as well the ability to use multimedia tools for remote communication
B14	Capacity to apply the theoretical and practical knowledge acquired in a specialised academic context
C7	Acquire and understand knowledge regarding: The main instrumental techniques applied to the business context
C12	Solve problems effectively and make decisions using the appropriate quantitative and qualitative methods, including the identification, expression and solution of business problems

## Expected results from this subject

Expected results from this subject	Training and Learning Results	
(*) <input type="checkbox"/> Comprender as técnicas matemáticas básicas, necesarias para a modelización do comportamento económico.	B1 B6	C7 C12
(*) <input type="checkbox"/> Avaliar, utilizando técnicas matemáticas, as consecuencias das distintas alternativas de acción e seleccionar as máis idóneas.	B1 B5 B6 B14	C7 C12
(*) <input type="checkbox"/> Ser capaz de formular modelos simples de relación das variables económicas baseados no manexo da álgebra lineal e do cálculo diferencial.	B1 B5 B6 B14	C7 C12

(\*) Ter habilidades para argumentar de modo rigoroso, coerente e intelixible, tanto na expresión oral como na escrita.

B1  
B5  
B6  
C7  
C12

## Contents

Topic	
Preliminaries.	Mathematical symbols. Real functions of real variable. Elementary functions. Basic mathematical calculations.
Functions of a real variable.	Limits of real functions of real variable. Continuity of real functions of real variable. Theorems related to global continuity. Derivative of a function at a point. L'Hôpital's rule. Rolle and mean value theorems. Higher order derivatives and relative extremes. Concavity and convexity.
Integration.	Areas under curves. Fundamental theorem of integral calculus. Primitives.
Matrix calculus.	Matrices. Determinant of a square matrix. Systems of linear equations. Eigenvalues of a square matrix. Quadratic forms.
Derivatives of functions of several variables.	Introduction. Vectors. Partial derivatives. Differentiable functions. The chain rule. Higher order derivatives. Homogeneous functions. Euler's theorem.
Optimization.	Concave and convex functions. Unrestricted optimization. Optimization with equality constraints.

## Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	37	37	74
Problem solving	33	50	83
Seminars	0	8	8
Autonomous problem solving	1.5	7	8.5
Autonomous problem solving	1.5	7	8.5
Autonomous problem solving	1.5	6	7.5
Essay questions exam	3	32.5	35.5

\*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

## Methodologies

	Description
Lecturing	Activity in which problems and/or exercises related to discipline are formulated. Students must autonomously develop the analysis and resolution of problems and/or exercises.
Problem solving	Activity in which problems and/or exercises related to the subject are formulated. Students must develop the appropriate or correct solutions through the exercise of routines, the application of formulas or algorithms, the application of transformation procedures of the available information and the interpretation of the results. It is usually used as a complement to the lecturing.
Seminars	Interviews that the student body maintains with the teaching staff for the advice/development of activities of the subject and the learning process.
Autonomous problem solving	Activity in which problems and/or exercises related to discipline are formulated. Students must autonomously develop the analysis and resolution of problems and/or exercises.
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## Personalized assistance

### Methodologies Description

Seminars	All information regarding the tutoring timetable and the application procedure will be available on the platform of the subject (Moovi).
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## Assessment

	Description	Qualification	Training and Learning Results
Autonomous problem solving	Resolution of exercises by the students, related to the contents explained in the classroom.	20	B1 B5 B6 B14 C7 C12

Autonomous problem solving	Resolution of exercises by the students, related to the contents explained in the classroom.	20	B1 B5 B6 B14	C7 C12
Autonomous problem solving	Resolution of exercises by the students, related to the contents explained in the classroom.	20	B1 B5 B6 B14	C7 C12
Essay questions exam	Test with theoretical questions and exercises to develop in a limited time.	40	B1	C7 C12
This test will provide the final grade for the students who opt for the global evaluation modality.				

### Other comments on the Evaluation

The dates of the exams of the subject can be consulted on the website of the Faculty <http://fccee.uvigo.es>

On the other hand, the dates of the rest of the continuous evaluation tests will be published in the course platform with sufficient time in advance.

The final grade for the course will be given by the following formula:  $NF=A+(10-A)E/10$  where A is the grade for the continuous assessment (maximum of 6 points) and E is the grade for the final exam (maximum of 10 points). In case of not passing the subject in the first call, the mark obtained for the work throughout the course will be maintained for the second call. The grade of NOT PRESENTED will not be applied to any student who takes any of the final exams.

The same evaluation system will be followed in the case of the end-of-course call.

### Sources of information

#### Basic Bibliography

Balbás, A., **Análisis matemático para la economía I. Cálculo diferencial**, AC, 1991

Sydsaeter, K. e outros., **Matemáticas para el análisis económico**, Pearson, 2012

#### Complementary Bibliography

Balbás, A. e outros., **Análisis matemático para la economía II. Cálculo integral y sistemas dinámicos**, AC, 1991

Besada, M. e outros., **Cálculo diferencial en varias variables: problemas y ejercicios tipo test resueltos**, Alfaomega, 2012

### Recommendations

### Other comments

This subject in the PCEO Degree in Business Administration and Management-Degree in Law is taught in the first quarter of the first year and the teachers in charge are Carmen Quinteiro Sandomingo and Miguel Mirás Calvo.