



IDENTIFYING DATA

Mathematics: Mathematics

Subject	Mathematics: Mathematics			
Code	V06G270V01104			
Study programme	(*)Grao en Comercio			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Basic education	1st	1st
Teaching language	Spanish Galician			
Department	Mathematics			
Coordinator	García Cutrín, Francisco Javier Herves Beloso, Carlos			
Lecturers	Alonso Álvarez, José Nicanor García Cutrín, Francisco Javier Herves Beloso, Carlos Quinteiro Sandomingo, María del Carmen Sanmartín Carbón, Esperanza			
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General description	The Mathematics subject, in the Degree in Commerce, has as its primary function to provide students with the language, knowledge and basic mathematical techniques that they will need both in their training and in their professional career. It will also help develop logical thinking to solve problems, the ability to analyze data, the interpretation of results and the synthesis of conclusions. Participation, collaboration and the critical spirit will be encourage at all times. With this purpose, understanding and management of the concepts and fundamental techniques of linear algebra and calculus will be sought during the course; as well as its application to diverse areas of study.			

Competencies

Code	
C21	(*)CE21. Identificar e resolver os problemas modelizables aplicados ás situacións económicas mediante a aplicación das técnicas matemáticas axeitadas, así como interpretar a solución que proporciona o modelo.
D3	(*)CT3. Capacidade de aprendizaxe, traballo autónomo e planificación e organización do traballo.
D4	(*)CT4. Capacidade de análise e síntese, e pensamento crítico.
D5	(*)CT5. Capacidade para aplicar os coñecementos teóricos e prácticos adquiridos no contexto académico. En especial, para aplicar coñecementos e razoamentos multidisciplinares.
D17	(*)CT17. Atención ao detalle, precisión, motivación pola mellora continua.

Learning outcomes

Expected results from this subject		Training and Learning Results
Knowledge of the basic techniques of derivation of real functions of real variable and its application in the economic context	C21	D3 D4 D5 D17
Calculation of the eigenvalues of a matrix, determination of whether or not a matrix is diagonalizable and classification of quadratic forms regarding to its sign	C21	D3 D4 D5 D17
Application of the basics and rules of differential calculus of functions of several variables with the purpose of formulate and solve optimization problems.	C21	D3 D4 D5 D17

Contents

Topic	
Real function	Introduction. Elementary functions: Graphs and properties (domain, continuity, growth / convexity). Derivability. Economic interpretation. Higher order derivatives: Convexity. Optimization.
Matrix calculus	Matrices. Operations with matrices. Determinants Systems of linear equations. Eigenvalues. Diagonalization. Quadratic forms.
Functions of several variables	Introduction. Elementary functions. Graphs and properties (domain, continuity, convexity). Partial differentiation: Calculation and interpretation. Jacobian matrix. Chain rule. Derivatives of a higher order. Hessian matrix. Convexity and concavity. Optimization. Lagrange problems.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	26	26	52
Autonomous problem solving	0	16	16
Seminars	20	30	50
Short answer tests	2	12	14
Essay questions exam	2	16	18

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

Methodologies

	Description
Lecturing	Exposition by the faculty of the general lines of contents, theoretical and practical, on the subject; with the objective of facilitating students the acquisition of knowledge
Autonomous problem solving	Resolution of problems proposed during the lessons
Seminars	Participation of the students will be encourage in order to expose their difficulties, help to solve the questions raised by other students in class or solving exercises suggested by the professor

Personalized attention**Methodologies Description**

Seminars	In the practical classes, all the doubts that the students might raised will be answered
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Assessment

	Description	Qualification	Training and Learning Results
Lecturing	Attendance and attitude during the lectures will be assessed	10	D4 D17
Seminars	The work done during practical classes will be valued	30	C21 D3 D4 D5 D17
Essay questions exam	These short essay questions will be part of the final test which will assess the student's acquisition of contents	60	C21 D3 D4 D5 D17

Other comments on the Evaluation**Sources of information**

Basic Bibliography

Adams, R., **Cálculo**, 6ª Edición, Pearson, 2009

Larson, R.; Edwards, B.H., **Cálculo 1: De una variable.**, 9ª Edición., McGraw Hill, 2010

Larson, R.; Edwards, B.H., **Cálculo 2: De varias variables.**, 9ª Edición., McGraw Hill, 2010

Complementary Bibliography

Besada Morais, M.; et al., **Cálculo de varias variables: Cuestiones y ejercicios resueltos.**, 1ª Edición., Pearson Educación, 2001

Blanco García, S.; et al., **Matemáticas Empresariales I: Enfoque teórico-práctico. Vol.1. Álgebra Lineal**, 1ª Edición., AC Thomson, 2002

Blanco García, S.; et al., **Matemáticas Empresariales I: Enfoque teórico-práctico. Vol. 2. Cálculo diferencial.**, 1ª Edición., AC Thomson, 2004

Calvo, M. E.; et al., **Problemas Resueltos de Matemáticas Aplicadas a la Economía y la Empresa.**, 1ª Edición., AC Thomson, 2003

Cámara Sánchez, A.; et al., **Problemas Resueltos de Matemáticas para Economía y Empresa.**, 1ª Edición., AC Thomson, 2003

Demana, F.D.; et al., **Matemáticas Universitarias Introdutorias con Nivelador Mymathlab.**, 1ª Edición., Pearson Educación, 2009

Jarne, G.; et al., **Matemáticas para la Economía: Álgebra Lineal y Cálculo Diferencial**, 1ª Edición., McGraw Hill, 2001

Jarne, G.; et al., **Matemáticas para la Economía: Programación Matemática.**, 1ª Edición., McGraw Hill, 2001

Jarne, G.; et al., **Matemáticas para la Economía. Libro de Ejercicios: Álgebra Lineal y Cálculo Diferencial**, 1ª Edición., McGraw Hill, 2004

Verdejo Rodríguez, Amelia, **Matemáticas: Grao en Comercio**, 1ª Edición., Servizo de Publicacións da Universidade de Vigo, 2013

Recommendations