COURSE DATA

DATA SUBJECT

Code: 35882
Name: Mathematics
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1314 - Degree in International Business	Facultat d'Economia	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1314 - Degree in International Business	Mathematics	BASIC

COORDINATION

JUAN MARTINEZ MARIA DEL CARMEN

SUMMARY

Mathematics is a one semester foundation course in basic mathematics for business placed in the first term (September-January) of the first year of the Degree in International Business.

This course is concerned with the essential mathematics for the quantitative description, analysis and comprehension of economic environment and for making business decisions. Moreover, it provides the basic concepts, techniques and mathematical tools for dealing with the other courses of this Degree.

Contents include matrix algebra, functions of one and several variables: tendency, continuity and differentiability, and an introduction to mathematical programming and integral calculus.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

The only prerequisite is standard elementary calculus, linear algebra and differentiation of functions of one variable.

COMPETENCES / LEARNING OUTCOMES

1314 - Degree in International Business

Actuar con autonomía en el aprendizaje, tomando decisiones fundamentadas en diferentes contextos, emitiendo juicios en base a la experimentación y el análisis y transfiriendo el conocimiento a nuevas situaciones.

Analyse and interpret complex economic and financial information for strategic business and economic decision-making in international environments, taking into account the social, economic and geopolitical realities of international markets.

Apply advanced quantitative and qualitative methods for the analysis of business data, enabling the identification of the strengths and weaknesses of companies and their projects and supporting decision-making in a global context.

Aprender a razonar de una forma rigurosa y sistemática, adoptando una actitud emprendedora para la solución de nuevos problemas complejos.

Be able to work in multidisciplinary and intercultural teams.

Develop the capacity to evaluate and critically analyse international economic phenomena and agents.

Develop the capacity to prepare and defend reports that contribute to the decision-making of public and private agents.

Identify and integrate emerging business trends and practices within the context of globalisation using appropriate mathematical, statistical and econometric techniques, including digital transformation and innovation.

Know how to use the statistical methods and software to manage the company's operations.

Learn autonomously and continuously, making informed decisions in diverse contexts, critically analysing information obtained through practice and study and applying knowledge to new situations within the field of international business.

Proponer soluciones creativas e innovadoras a situaciones o problemas complejos, propios del ámbito de conocimiento, para dar respuesta a las diversas necesidades profesionales y sociales.

Resolver problemas mediante la aplicación de las matemáticas, utilizando un lenguaje simbólico.

Use the economic and financial information of the company to make decisions.

Utilizar rigurosamente el lenguaje matemático y el razonamiento lógico-deductivo en la formulación de los fenómenos económico-empresariales.

DESCRIPTION OF CONTENTS

1. Basics of algebra

Systems of linear and nonlinear equations. Matrices, determinants and inverse matrices.

2. Limits and continuity of functions

Introduction to the topology of Rn. Functions of one and more variables: homogeneous, composite and implicit functions. Graphs of functions: level curves. Concepts of limit and continuity.

3. Derivability of functions

Definition and economic interpretation of the derivative of functions of one variable. Rules for differentation. Definition and economic interpretation of the partial derivatives of real and vector valued functions of several variables. Higher-order derivatives of real- and vector-valued functions of several variables. Differential vector and matrix and hessian matrix.

4. Differentiability of functions

Differentiability of functions. Relation between continuity, derivability and differentiability. Directions of maximum growth of a function.

5. Introduction to mathematical programming

Formulation of a problem of mathematical programming. Type of problems. Modelling.

6. Introduction to integral calculus

Techniques of integration. Riemann integral. Existence of the definite integral and Barrow's rule. Improper integrals.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	30,00
Classroom practices	30,00
Total hours	**60,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	0,00
Independent study and work	40,00
Preparation of lessons	28,00
Preparation for assessment activities	15,00
Resolution of case studies	7,00
Total hours	**90,00**

TEACHING METHODOLOGY

The learning methodology consists of **lectures** and **practice sessions**, where the teacher encourages students in the use of mathematical and symbolic language and logic and systematic thinking and he/she promote the individual and team private study learning.

In the **lectures** the lecturer explains the major topics, illustrate and clarifies definitions and theorems using completely worked out examples, and assists students in their self-study learning and use of the bibliography. The lecturer's explanations will be combined with the students' participation in class through small questions and exercises designed for the discussion of frequent doubts. At the end of the class, the lecturer will give guidelines and homework to prepare next class at home. The aim is that the student develops his/her capacity for self-study and self-learning and for expressing formally using mathematical and symbolic language.

In the **practice sessions** the lecturer shows the main economic and business applications of the topics developed in the lectures and encourages students in the definition, solution and formal discussion of complex problems. The lecturer will solve worked out problems and he/she will propose the preparation of new ones for the next classes. Thus, each student will be able to formulate problems and propose and justify his/her method of resolution.

The study and/or posterior development of lectures and practice sessions will generate **written assignments** and **class and homework tasks** which will be taken into consideration in the continuous assessment of student.

EVALUATION

The evaluation of the course is based on a system consisting of the following components:

1. Written exam. This will take place on the official date scheduled for the course exam. It will assess the specific competencies of the course in terms of content and its application (maximum score: 7 points). In order to pass the course, it is essential to pass this written exam, which means obtaining a minimum score of 3.5 points.

2. Continuous assessment. This will evaluate the achievement of the general competencies of the degree program and the participation and involvement of the student in the teaching-learning process through the completion of exercises (maximum score: 3 points). Activities under continuous assessment are recoverable.

The final grade will be the sum of the score obtained in the written exam and the score from continuous assessment. Naturally, in order to pass the course, the final grade must be equal to or greater than five (5). In cases where the written exam is not passed, but the sum of the written exam score and the corresponding continuous assessment score exceeds 5, the final grade recorded in the official transcript will be a FAIL (4.5).

REFERENCES

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