COURSE DATA

DATA SUBJECT

Code: 36759
Name: Mathematics
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2026-27

STUDY (S)

Degree	Center	Acad. year	Period
1933 - Double Degree in Law and Economics_2022	Facultat d'Economia	1	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1933 - Double Degree in Law and Economics_2022	Asignaturas de primer curso	COMPULSORY

COORDINATION

MENEU GAYA ROBERT

SUMMARY

Mathematics is a semester-long basic training subject that is taught in the first year, first semester of the double Degree in Law and Economics and consists of a total of 6 credits.

This subject studies the basic mathematical tools for the description, analysis and understanding in quantitative terms of the economic environment, techniques and basic mathematical instruments to successfully tackle the double degree.

These contents include the review of matrix calculus, the study of functions of one and several variables: continuity and marginal analysis, and the approach and resolution of optimization problems with restrictions.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

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

OTHER REQUIREMENTS

Previous knowledge corresponding to first and second year of high school in the branch of humanities and social sciences is assumed.

COMPETENCES / LEARNING OUTCOMES

DESCRIPTION OF CONTENTS

1. Basic notions of algebra

Systems of linear and nonlinear equations. Matrix, determinants, range and calculation of the inverse.

2. Limits and continuity of functions

Notions of topology in Rn. Functions of one and several variables: homogeneous, compound and implicit function. Graphs of functions: level curves. Concepts of limit and continuity.

3. Derivability of functions

Definition and economic interpretation of the derivative of a real function. Derivative calculation. Definition and economic interpretation of partial derivatives of scalar and vector functions. Successive derivatives of functions of one or more variables. Gradients, Jacobian and Hessian.

4. Diferenciability of functions

Differentiability of functions. Relationship between the concepts of continuity, derivability and differentiability. Directions of growth of a function. Derivative of composite function. Derivative of the implicit function.

5. Optimization

Basic concepts. Unconstrained optimization with one or more decision variables. Optimization with equality constraints: Lagrange multipliers method. Optimization with inequality constraints: Kuhn and Tucker conditions. Modeling of nonlinear, linear and integer linear problems.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theoretical and practical classes	60,00
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	60,00
Preparation of lessons	0,00
Preparation for assessment activities	20,00
Resolution of case studies	10,00
Total hours	**90,00**

TEACHING METHODOLOGY

The didactic methodology to carry out the objectives is supported by theoretical and practical classes in which the teacher will promote the use of mathematical and symbolic language and rigorous and systematic reasoning, and will favor the autonomous work of the student both individually and as a team.

In the theoretical classes, the teacher will highlight the main aspects of each topic, make standard examples and guide the study of the students through the materials available in the virtual classroom and the basic bibliography. The explanations will be combined with the participation of the students through the discussion of proposed exercises and / or brief questions posed by the teacher for the class discussion of the most frequent doubts. At the end of the class, the necessary materials for the next class will be indicated, so that the student can prepare the session.

It is intended that the student develop her capacity for autonomous work (with the work prior to class) and her ability to argue rigorously using mathematical and symbolic language.Together with these classes, practical classes will be developed in which the theoretical knowledge studied will be applied in the analysis of business problems and the ability of the student to define, solve and expose complex problems in a systemic way. The teacher will previously solve some standard problems and propose the realization of others for subsequent classes, so that in each class the student must be able to pose the proposed problems and clearly defend a resolution method.

The planning of practical activities (number, characteristics and location in the course schedule) will be presented in the first class of each group and course, and will be published in the Virtual Classroom (http: //aulavirtual.uv.es) or in the faculty website.

The study prior and / or after the development of the theoretical and practical content may lead to "deliveries" or "tests" that will be subject to continuous evaluation by the teacher during the semester.

EVALUATION

The evaluation of the subject is based on a system that consists of the following parts:

- Written exam on the day the subject exam is officially convened, in which the specific competencies of the subject will be evaluated regarding content and its application (maximum mark 7 points).
- Continuous evaluation of the student in which the achievement of the general competences of the degree and the participation and involvement of the student in the teaching-learning process will be evaluated (maximum mark 3 points). Continuous assessment activities are recoverable.

To pass the course, the written exam must be passed. The final grade will be obtained from the sum of the written exam grade plus the continuous assessment grade. In case of not passing the written exam, the final mark will be a maximum of 4.5. Logically, to pass the subject, a final grade greater than or equal to five (5) must be obtained.

REFERENCES

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- Barbolla, R., Cerdá, E. y Sanz, P. (2011): Optimización. Programación Matemática y aplicaciones a la Economía. Ed. Garceta. S i519.87 BAR

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- Sydsaeter K. y Hammond P. J. (2002) Matemáticas Esenciales para el Análisis Económico. Ed. Pearson. S 51 SYD

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- Barrios García, Javier A. y otros (2022): Análisis de funciones en Economía y Empresa. Un enfoque interdisciplinar. 2ª edición. Ediciones Díaz de Santos. S i330.4 BAR

- Meneu Gaya, Robert (2022): Apunts de Matemàtiques. https://hdl.handle.net/10550/83464