

**Title of course:** Análisis Matemático II

**Program title:** Licenciatura en ADE Asig. Oblig. ENGLISH cycle 1

**Code:** 04C50829

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**Type:** Troncal **Year:** 2 **Semester:** 1 and 2

**Credits (hours/week):** 4.5

**ECTS Credits:** 4.5

**Language:** Spanish

**Faculty:**

Rosa Varela Otero

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**Prerequisites:**

There are no compulsory prerequisites, but it is useful to have knowledge of matrixes and the resolution of linear equation systems, as well as to be familiar with the mathematical reasoning learned in Mathematical Analysis I.

**Previous knowledge:**

Properties of real numbers.

Concept of application between two sets.

**Course description:**

It is a second-year obligatory subject and corresponds to the basic content of a course on linear algebra, with particular emphasis on the possible applications in using a large amount of data, and in the acquisition of practice in the understanding and analysis of mathematical principles and in the capacity for deductive reasoning.

**Course objectives:**

At the end of the course, students must be capable of the following:

1. Interpreting matrixes of all sizes and  $R^n$  points and vectors.
2. Performing all the usual matrix operations.
3. Using the Euclidian space  $R^n$  as a tool for the geometric understanding of the techniques for reducing large-size matrixes.
4. Knowing how to use matrix calculation to solve many of the problems requiring a large amount of data.
5. Knowing how to use DERIVE to perform the abovementioned matrix calculations.

**Contents:**

SUBJECT 1: MATRIXES, DETERMINANTS, LINEAR EQUATION SYSTEMS

SUBJECT 2: VECTORIAL AND EUCLIDIAN SPACES: THE  $R_n$  SPACE  
SUBJECT 3: ENDOMORPHISMS AND SQUARE MATRIXES:  
DIAGONALISATION  
SUBJECT 4: BILINEAR AND QUADRATIC FORMS: CLASSIFICATION

**Methodology:**

The subject includes a weekly session of one and a half hours, combining theory and related problems. At the end of each session, students are given a set of exercises related to the theory class to be solved at home. The doubts arising while solving these exercises can be looked at in the one-hour tutorials, which take place once a week.

For each subject, students have notes on the theory, completed exercises and a set of exercises for doing at home.

New material is regularly added to the course website: self-assessment (with the solution after a few days), revision exercises that are also completed or to be completed and consulted in class, examinations from previous years, solutions to all their tests and examinations, etc.

Furthermore, in each subject, students have to do practicals with a mathematical calculation programme (DERIVE) which they learned to use in mathematical Analysis I and for which they are given a manual with the necessary instructions and completed examples.

**Evaluation:**

A1. Final examination

A2. Ten-minute tests at the end of the class, with an average of one every two sessions, on theory and/or the exercises examined. Partial examination which does not eliminate material.

J. Participation in class and attendance to tutorials.

The final mark for the course is obtained as follows:

- 20% from the average test mark after eliminating the three worst scores and only if it improves the final examination mark.

- 20% from the partial examination mark, only if it improves the final examination mark.

- 60% from the final examination mark.

Participation in class is taken into account overall in the final mark.

**Performance criteria:**

Objectives 1, 2, 3 and 4:

Students must demonstrate the ability to work with matrixes and that they have acquired the knowledge, language and techniques required to work in a Euclidian space and with large-size matrixes (A and J).

Objective 5:

Students must demonstrate fluency in DERIVE to solve some of the questions or exercises set on the examinations or in class (A and J).

**Textbooks:**

BLANCO, S. et al. Matemáticas Empresariales I. Enfoque teórico-práctico. Vol. I. Álgebra Lineal. Editorial AC - Thomson, 2003.

CÁMARA A. et al. Problemas Resueltos de Matemáticas para Economía y Empresa. Editorial AC - Thomson, 2003.

**Other required material:**

SANZ, P. et al. Problemas de Álgebra Lineal. Cuestiones, ejercicios y tratamientos en DERIVE®. Prentice Hall, 1998.

AGUILÓ, I. et al. Àlgebra lineal. Aplicacions en Economia. Palma de Mallorca: Universitat de les Illes Balears, 2000 (Colección Materials Didàctics, 70).

GARCÍA M. T. et al. Álgebra. Teoría y Ejercicios. Editorial Paraninfo, 1993.

JARNE, G. et al. Matemáticas para la Economía. Álgebra Lineal y Cálculo Diferencial. McGraw-Hill, 2001.

BARBOLLA, R. et al. Álgebra lineal y teoría de matrices. Prentice Hall, 1998.

CABALLERO, R. et al. Matemáticas aplicadas a la Economía y a la Empresa. 380 ejercicios resueltos y comentados. Ediciones Pirámide SA, 1993.

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