Universidad Zaragoza

Academic Year/course: 2024/25

30106 - Mathematics II

Syllabus Information

Academic year: 2024/25
Subject: 30106 - Mathematics II
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
179 - Centro Universitario de la Defensa - Zaragoza
Degree: 425 - Bachelor's Degree in Industrial Organisational Engineering
563 - Bachelor's Degree in Industrial Organisational Engineering
ECTS: 6.0
Year: 1
Semester: Second semester
Subject type: Basic Education
Module:

1. General information

The basic mathematical methods which form part of the number of tools with which all engineers must count on to solve any problem that might appear on their work. This subject provides the student with the capacity to solve mathematical problems that might appear in engineering about differential and integral calculus and geometry.

Defence profile:

The curriculum is in the process of being phased out. The content of this teaching guide is the same as that of the 2023-2024 academic year. It can be consulted on this same website by selecting the aforementioned academic year at the top.

2. Learning results

- RA-1. Solve mathematical problems that may arise in Engineering.
- RA-2. Have the aptitude to apply the acquired knowledge of Linear Algebra, Geometry, Differential Geometry, Numerical Methods and Numerical Algorithmics.
- RA-3. Know how to use numerical methods in the solution of some mathematical problems.
- RA- 4. Know the reflexive use of symbolic and numerical calculation tools.
- RA- 5. Possess scientific-mathematical thinking skills that allow them to ask and answer certain mathematical questions.
- RA- 6. Be skilled in handling mathematical language; in particular, symbolic and formal language

3. Syllabus

COMPANY PROFILE

Algebra:

1. Linear equations in linear algebra.
2. Matrix algebra.
3. Determinants.
4. Vector spaces.
5. Eigenvalues and eigenvectors
6. Orthogonality and least squares.

Integral calculus:

1. Multiple integrals.
2. Curves.
3. Surfaces.
4. Vector analysis.

4. Academic activities

COMPANY PROFILE

- **Theoretical classes**, in which the fundamental concepts are presented, complemented with detailed examples that

illustrate them.

- **Practical classes**, in which problems are proposed to be solved using the concepts and methods previously considered and with the support of specific computer software.
- **Assessment tests**.
- **Personal work of the student** (individually or in groups).

5. Assessment system

COMPANY PROFILE

There will be **two written tests** along the term. They will test theoretical and practical aspects of the subject. They are related to learning results 1, 2, 3 and 4. Their weight in the final grade will be 50% each.

The final grade (100%) will be calculated by adding weighted the grade of each evaluation milestone, without the requirement of to achieve a minimum grade in each of the tests. To pass the subject, the student must obtain a grade equal or higher than 50 %.

If the student has not passed any of these activities during the semester, they will have the opportunity to pass the subject by means of a **global test** in the two official exams.

Assessment criteria: The assessment criteria are the same. The following will be valued:

- understanding of the mathematical concepts used to solve the problems;
- use of strategies and efficient proceedings for their resolution,
- clear and detailed explanations with justification for the answers,
- absence of mathematical errors in the development and the solutions,
- adequately interpret the results obtained,
- correct use of terminology and notation
- orginsed and clear presentation.

6. Sustainable Development Goals

4 - Quality Education
5 - Gender Equality
9 - Industry, Innovation and Infrastructure