

28805 - Mathematics II

Syllabus Information

Academic year: 2023/24

Subject: 28805 - Mathematics II

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

Degree: 424 - Bachelor's Degree in Mechatronic 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.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) and certain specific targets, such that the acquisition of the learning results of the subject will contribute to some extent to the achievement of targets 4.4 and 4.5 of Goal 4, and targets 9.5 and 9.c of Goal 9.

2. Learning results

1. Applying the basic concepts of differential and integral calculus, linear algebra, statistic and probability.
2. Knowledge of the specific mathematical software and its use on the problem solving.
3. Knowledge of mathematical terminology, notation and methods.
4. Critical analysis of the obtained results.

3. Syllabus

- 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

- **Theoretical lessons**, in which the fundamental concepts are explained complemented by detailed examples to illustrate them.
- **Practical lessons** in which problems that must be solved using the concepts and methods previously considered and the support of specific software are proposed.
- **Assessment**
- **Autonomous work** (individual or group).

5. Assessment system

- **Written tests:** There will be two written tests along the term. They will test theoretical and practical aspects of the subject. They will relate to learning results 1, 2, 3 and 4. 80 % of the grade.
- **Assessment criteria:** To test the evolution of the students, 4 periodical controls will be taken in class. They will consist on practical exercises. The learning results with those that are related are 1, 2, 3 and 4. Its total weight in the final grade will be 20%.

Final grade (100 %) will be calculated considering each assessment instrument, without having to reach 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
- organised and clear presentation.