Universidad Zaragoza

Academic Year/course: 2023/24

29504 - Fundamentals of Mathematics I

Syllabus Information

Academic year: 2023/24
Subject: 29504 - Fundamentals of Mathematics I
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 625 - Bachelor's Degree in Industrial Processes' Data Engineering
ECTS: 6.0
Year: 1
Semester: First 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 students with the ability to solve mathematical problems that may arise in engineering on differential calculus, integral and differential equations.

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. Learn the basics necessary to solve mathematical problems that may arise in Linear Algebra; Graph Theory; Differential and Integral Calculus, Numerical Methods and optimization.
2. Know the reflective use of symbolic and numerical computation tools.
3. Possess scientific-mathematical thinking skills that allow them to ask and answer certain mathematical questions.
4. Have the ability to handle mathematical language; in particular, symbolic and formal language.

3. Syllabus

1. Complex numbers
2. Real functions of a real variable. Limits and continuity.
3. Differential calculus in one variable functions.
4. Integral calculus in one variable functions.
5. Introduction to ordinary differential equations.

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.
- Asessment
- 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: In order to evaluate the evolution of the students in class, 4 controls will be carried out, which will consist of periodic in-class exercises, which will consist of 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
- orginsed and clear presentation.