Universidad Zaragoza

Academic Year/course: 2023/24

27202 - Mathematics

Syllabus Information

Academic year: 2023/24
Subject: 27202 - Mathematics
Faculty / School: 100 - Facultad de Ciencias
Degree: 452 - Degree in Chemistry
ECTS: 12.0
Year: 1
Semester: Annual
Subject type: Basic Education
Module:

1. General information

The objective of this subject is to manage the mathematical and informatics tools needed in Chemistry, to use with fluency the most used mathematical terminology in Chemistry, to transmit in written form the acquired mathematical knowledge and to know the application of the acquired knowledge to Chemistry.

The approaches and objectives of the subject are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030: 4 (quality education), 5 (gender equality), 8 (decent work and economic growth) and 10 (reduction of inequalities).

2. Learning results

- Know and understand the techniques of matrix calculus and its use in Linear Algebra, and be able to apply them in the construction of numerical methods to solve linear systems of equations.

- Know, understand and apply the most used analytical and numerical techniques in the approximation of functions of one variable, such as Taylor development, interpolation and least squares

- Extract information from functions of several variables, such as the location of maxima and minima.

- Understand the basic analytical and numerical techniques of integration of functions of one and several variables and be able to apply them to line and surface integrals

- Know and distinguish ordinary differential equations and some elementary methods of solution.

- Analyse and evaluate which numerical techniques can be used in certain practical problems.

3. Syllabus

1. Differential calculus in one variable.
2. Systems of linear equations and vector spaces.
3. Diagonalization of matrices.
4. Differential calculus in several variables.
5. Interpolation. Solving nonlinear equations.
6. Integration in one variable.
7. Multiple integration.
8. Line and surface integration.
9. Introduction to differential equations.

4. Academic activities

- Master classes: 75 hours.
- Problem solving and case studies: 30 hours.
- Computerized practices: 15 hours.
- Teaching assignments: 50 hours.
- Study: 150 hours.
- Assessment tests. 8 hours.

5. Assessment system

The student, in order to demonstrate that they has achieved the learning results foreseen in the course, can choose one of the following evaluation procedures:

1. Continuous assessment

The continuous evaluation consists of two parts, corresponding to each of the semesters. Each part will be worth 50% of the final grade and to pass the subject it will be necessary to obtain at least 4 points out of 10 in each of them and that the average grade is equal to or higher than 5 points.

- The grade of the first part will be obtained with:

  - a written test (20 % of the grade)
  - active participation in class and problem solving (10 % of the grade)
  - a written exam to be taken in January, according to the exam schedule (70% of the grade). The student has the option of repeating this exam in the first official call for exams (May-June) of the subject..

- The grade for the second part will be obtained with:

  - a written test (20 % of the grade)
  - active participation in class and problem solving (10 % of the grade)
  - a test in the last practice session (15 % of the grade)
  - a written exam to be taken in the first official call for exams of the subject (55 % of the grade)

In the case of opting for the continuous evaluation, the grades obtained in all the activities of the first and second part are saved for the second call, so that in the second call the student can choose to retake only the exam of the first and/or second part.

2. Overall test

Students who do not choose the continuous evaluation will be evaluated, both in the first call (May-June) and in the second call (June-July), with a global test, which will allow them to opt for 100% of the grade. The exam of the global test will have two parts and each of them will have a weight of 50% of the final grade. In order to pass the subject through the global test, it will be necessary to obtain a minimum grade of 5 points out of 10. The content of each part of the global test will be related to the subject matter taught in each of the semesters, including the practices, and will be different from the exams taken as part of the continuous evaluation. The global test will be held on the official date of the examination calendar.

Very important: all students who wish to take the global test must communicate it in writing to the teachers responsible for the subject at least 2 days before the day of the test

Undergraduate Studies Permanence Regulations and Regulations for the Evaluation of Learning Standards http://wzar.unizar.es/servicios/coord/norma/evalu/evalu.html