29900 - Mathematics I

Syllabus Information

Academic year: 2023/24
Subject: 29900 - Mathematics I
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 435 - Bachelor's Degree in Chemical Engineering
ECTS: 6.0
Year: 1
Semester: First semester o Second semester
Subject type: Basic Education
Module:

1. General information

Mathematics I is a basic subject in the curricula of Engineering degrees, taught in the first four-month period and whose overcoming is convenient to successfully address the subject of Mathematics III which is taken in the second semester of the first year.

The main objective of the subject is the mastery of its contents: differential calculus, integral calculus and series, by means of analytical, numerical and computational techniques .

It is required to have acquired baccalaureate mathematical knowledge.

These approaches and objectives are aligned with the Sustainable Development Goals (SDGs) of the 2030 agenda of United Nations (https://www.un.org/sustainabledevelopment/es/), so that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to its achievement.

2. Learning results

- Solve mathematical problems that may arise in engineering.
- Know how to apply the acquired knowledge of differential and integral calculus.
- Use numerical methods in solving some mathematical problems.
- Know the reflexive use of symbolic and numerical calculation tools.
- Possess mathematical scientific thinking skills that allow them to ask and answer certain mathematical questions .
- Acquire skills in the use of mathematical language; in particular, symbolic and formal language.

3. Syllabus

1. Real numbers. Real functions.

2. Complex numbers Elementary complex functions.

3. Differential calculus of one variable. Numerical solution of equations.

4. Approximation of functions: Taylor's formula. Interpolation.

5. Integral calculus of functions of one variable. Numerical integration.

6. Differential calculus of functions of several variables.

7. Integral calculus of functions of several variables.

8. Numerical series and power series.

4. Academic activities

- Master class. 48 hours.
    - Most of the theoretical content will be presented followed by practical exercises.
- Laboratory practices: 12 hours

    In these sessions, of two hours every two weeks, numerical algorithms are programmed and implemented by means of mathematical software of symbolic and numerical programming installed in the computer laboratories of EINA
- Directed works: 26 hours
- Study and personal work: 60 hours
- Assessment 4 hours

5. Assessment system

The subject will be evaluated in the global modality, by means of a written test of open answer carried out in the dates that the Center establishes for each one of the official calls. It will consist of three parts:

1. -A first part in which the theoretical and practical contents developed in the master classes will be evaluated. The grade will account for 70% of the total qualification.

2. -A second part in which the work done in the laboratory practices will be evaluated. The rating will be the

-20% of the total grade.

3. -A third part to be carried out by students who have not presented the proposed directed work in the term, and that will deal with any content of the subject. The grade will be 10% of the total grade.

Optionally, students may take the second part of the subject on a date prior to the overall assessment.

The grades obtained during the term, of the laboratory practices and of the directed works if they have been carried out, will be maintained in the second call, if the student so wishes .

The faculty may choose to carry out an intermediate test in order to encourage students to follow the subject and make it easier for them to pass it.