Academic Year/course: 2023/24

29700 - Mathematics I

Syllabus Information

Academic year: 2023/24
Subject: 29700 - Mathematics I
Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
Degree: 434 - Bachelor's Degree in Mechanical Engineering
ECTS: 6.0
Year: 1
Semester: 434-First semester o Second semester
107-First semester
Subject type: Basic Education
Module:

1. General information

The main objective of Mathematics I is for students to consolidate and expand the fundamentals of Differential and Integral Calculus, incorporating some numerical approximation methods. It is also a priority that the student learns to solve problems rigorously, selecting the most effective techniques and strategies available, thus enhancing the critical and abstract reasoning that characterizes this discipline, and using both analytical and numerical methodswith the support of appropriate mathematical software, giving priority here to the analysis and interpretation of results obtained.

These approaches and objectives are aligned with several of the Sustainable Development Goals, SDGs, of the Agenda 2030 (https://www.un.org/sustainabledevelopment/es/) and certain goals, among which we highlight 12.2, 12.5 and 13.3.

2. Learning results

To pass this subject, students must demonstrate the following results:

1. Solves mathematical problems that may arise in Engineering.
2. Aptitude to apply the acquired knowledge of Differential and Integral Calculus.
3. Know how to use numerical methods, with some mathematical software, in the resolution of some mathematical problems that are posed.
4. Know the reflexive use of symbolic and numerical calculation tools.
5. Possess scientific-mathematical thinking skills that allow them to ask and respond correctly and rigorously to certain mathematical questions.
6. Be skilled in handling mathematical language; in particular, symbolic and formal language.

3. Syllabus

The contents of the subject cover the following topics:

- Numerical sets and their applications
- Real functions of real variable
- Derivative and applications
- Polynomial approximation and applications
- Simple integral and applications
- Real functions of several variables

4. Academic activities

The subject's credits (6 credits = 150 hours) are divided into:

- Lectures (theory and problems): 42 hours.
- Participative problem classes in small groups: 6 hours
- Computer practices: 12 hours.
- Individual and group tutored work: 24 hours
- Autonomous study: 60 hours
- Examinations: 6 hours

Class materials will be available through Moodle: notes used in class, course syllabus, as well as other course-specific learning materials as well as other learning materials specific to the subject.

More information about the subject will be provided on the first day of class.

5. Assessment system

In each of the two official calls, the global test of the subject may be taken in two exams, one theoretical-practical and the other practical.

1. Theoretical-practical written exam (70%). Calculators and electronic devices are not allowed. This part will be evaluated from 0 to 10 points, being necessary to obtain a cut-off mark of more than 3.5 points to be able to count the rest of the scores.

2. Practical exam (30%, avoidable by continuous assessment). Calculators or electronic devices are supported with the mathematical software used during the term. It follows the theoretical-practical examination.

3. Continuous assessment (30%) by means of practical tasks and academic work. It avoids the practical exam. Those who take the practical exam waive any grade they may have received for continuous assessment.

4. In order to pass the subject, a cut-off mark higher than 3.5 must be obtained in the theoretical-practical exam and a total grade higher than or equal to 5 points out of a maximum of 10 possible points.
Final grade = (Theoretical-practical exam grade) x 0.70 + (Practical exam or continuous assessment grade) x P, where P=0 when the cut-off grade is not reached, and P=0.30 when the cut-off grade is exceeded.