

30202 - Mathematics I

Syllabus Information

Academic year: 2023/24

Subject: 30202 - Mathematics I

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura
326 - Escuela Universitaria Politécnica de Teruel

Degree: 439 - Bachelor's Degree in Informatics Engineering
443 - Bachelor's Degree in Informatics Engineering

ECTS: 6.0

Year: 1

Semester: First semester

Subject type: Basic Education

Module:

1. General information

The main objective is to acquire a solid foundation in calculus and problem solving skills. Introduce the use of mathematical software and numerical problem solving. To work on mathematical rigor, logical and deductive capacity, to select efficient techniques and strategies, and to promote critical and abstract reasoning. To enable students to study other subjects of the curriculum.

Prerequisites: solid knowledge of high school mathematics such as trigonometry, derivation in one variable, integration and arithmetic with complex numbers.

These approaches are aligned with the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 () United Nations (<https://www.un.org/sustainabledevelopment/es/>), since the subject is essential to knowledge of the rest of the degree that directly enables students to contribute to the achievement of the 2030 Agenda.

2. Learning results

1. Handle the basic concepts of passage to the limit, continuity, derivability and integrability of real functions.
2. Know and understand the basic concepts of sequences and series of real numbers. Know how to use the Taylor polynomial approximation.
3. To know basic aspects of function interpolation.
4. Understand the concept of exact value, approximate value and error estimation.
5. Know how to use numerical methods in the resolution of derivative and integration problems in case is not able to solve them exactly.

3. Syllabus

- Arithmetic with complex numbers.
- Calculus with one variable. Derivation.
- Calculus with one variable. Integration.
- Successions and series of real numbers.
- Calculation with several variables.

4. Academic activities

- **Theory lessons: 40 hours** The explanations and examples will guide the students in understanding and application of

mathematics.

- **Problem sessions: 10 hours** The students will solve questions and problems, analyzing the different possible options.
- **Practical classes with computer: 10 hours** Mathematical algorithms are analyzed and programmed by means of symbolic and numerical programming software installed in the center's computer laboratories.
- **Carrying out of proposed activities: 24 hours**
- **Study and personal work: 60 hours**
- **Assessment tests: 6 hours**

5. Assessment system

The following will be assessed: the correct use of efficient strategies and procedures, clear and detailed explanations, the absence of mathematical errors, the correct use of terminology and notation, the orderly, clear and organized exposition, the knowledge of the software used.

Students will be able to take a continuous assessment, but they will also have the opportunity to pass the subject by means of a global test in the two official exams.

The continuous assessment consists of:

1: EINA

Practical block (15%): Tests and final test with problems similar to the practical ones.

Theory and problems block (85%, minimum grade 4):

1) Continuous activity, PAC (25%):

A mid-term test will be conducted.

2) Reduced written test of theory and problems (60%): in the 1st call and will deal with a part of the following of the subject matter. To take this test, the PAC grade must be equal to or greater than 5 (out of 10).

2: EUPT

Partial written test (35%, minimum grade 4.5): theoretical-practical questions, problems and practical exercises.

Academic Work (10%): Assignments with theoretical-practical exercises.

Computer practice (20%): Work developed during the practical sessions and final exam of practices.

Final Exam (35%, minimum grade 4.5): Written test on the theoretical-practical contents of the subject, with exercises and questions of similar difficulty to those worked on in the term.