

## 29800 - Mathematics I

### Syllabus Information

**Academic year:** 2024/25

**Subject:** 29800 - Mathematics I

**Faculty / School:** 110 - Escuela de Ingeniería y Arquitectura

326 - Escuela Universitaria Politécnica de Teruel

**Degree:** 440 - Bachelor's Degree in Electronic and Automatic Engineering

444 - Bachelor's Degree in Electronic and Automatic Engineering

**ECTS:** 6.0

**Year:** 1

**Semester:** 440-First semester o Second semester

107-First semester

444-First semester

**Subject type:** Basic Education

**Module:**

### 1. General information

Objectives: to acquire a solid foundation in **Differential and Integral Calculus** and problem-solving skills; to introduce the use of mathematical software and **numerical problem solving**; to work on mathematical rigor, logical-deductive ability and to enhance critical and abstract reasoning; to prepare students for the study of other subjects in the syllabus.

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 (<https://www.un.org/sustainabledevelopment/es/>), since the subject is essential to base the knowledge of the rest of the degree that directly enables students to contribute to the achievement of the Agenda 2030.

### 2. Learning results

- Apply the acquired knowledge of Differential and Integral Calculus, related numerical methods and optimization to solve mathematical problems, particularly in the field of engineering.
- Use numerical methods in solving some mathematical problems.
- To use symbolic and numerical calculation tools in a reflexive way.
- Possess scientific-mathematical thinking skills that allow them to ask and answer certain mathematical questions.
- Manage and use with skill the mathematical language; in particular, the symbolic and formal language.

### 3. Syllabus

- Real numbers.
- Introduction to complex numbers.
- Functions of a real variable and/or sequences of real numbers and related concepts.
- Differential calculus of functions of one variable.
- Integration of functions of one variable.
- Functions of various variables.

### 4. Academic activities

- Theoretical and practical classes (38 hours). Explanation of the theoretical contents together with illustrative examples.
- Problem sessions (10 hours). Problem solving in small subgroups.
- Computer practices (12 hours). Analysis and programming of mathematical algorithms using symbolic and numerical programming software installed in the center's computer laboratories.
- Personal study and solution of proposed academic works and activities.
- Assessment tests.

At EUPT, the subject is taught in two different modalities: face-to-face (the above applies) and blended learning. In the blended learning modality, students will have at their disposal adapted activities and the necessary materials, accessible in the online subject (<http://moodle.unizar.es/>). Likewise, it will be guided by the professor with the help of the tutorials telematics.

### 5. Assessment system

Students may take a continuous assessment, but they will also have the opportunity to pass the course by means of a global

test in both official exams, being the global test compulsory in the second exam.

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

The continuous assessment consists of:

#### **Río Ebro Campus (Zaragoza):**

- Partial written test (40%, minimum grade 5 out of 10): problems and theoretical-practical questions of the first part of the subject.
- Final written theoretical-practical test (60%): problems and questions of the second part of the subject (40%) and problems of the practical part (20%). It will take place in the 1st official exam call.

#### **Teruel Campus**

Face-to-face activity:

- Partial written test (40%, minimum grade 4.5 out of 10): theoretical-practical questions, problems and practical exercises.
- Computer practice (20%): Work developed during the practical sessions and final practical exam.
- Final exam (40%, minimum grade 4.5 out of 10): Written test (in 1st call) on the theoretical and practical contents of the subject, with exercises and questions of similar difficulty to those worked on in the course,.

Semi-attendance mode:

- Non-attendance academic work (20%).
- Final on-site exam (80%, minimum grade 4.5 out of 10).

## **6. Sustainable Development Goals**

4 - Quality Education

9 - Industry, Innovation and Infrastructure

12 - Responsible Production and Consumption