

29600 - Mathematics I

Syllabus Information

Academic Year: 2020/21

Subject: 29600 - Mathematics I

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 430 - Bachelor's Degree in Electrical Engineering

ECTS: 6.0

Year: 1

Semester: 430-First semester o Second semester

107-First semester

Subject Type: Basic Education

Module: ---

1.General information

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The learning process is based on the following:

Lectures (theory and problems) (42 hours)

Practical sessions of computer (12 hours)

Tutorials and exhibition of work in the group (6 hours)

Preparation of works in group (14 hours)

Personal study of the student (73)

Realization of examinations and tests (3 hours)

To achieve that the students know the concepts of the course they will be needed theoretical lectures, practical sessions and group works.

The auxiliary material for the course is available in the ADD.

4.2.Learning tasks

The course includes the following learning tasks:

Classroom

They will be 3 hours a week into the classroom to complete a total of 42 hours. In these classes will be developed the theoretical contents and illustrative examples.

The contents of the course are divided into two main blocks: differential and integral calculus in one and several variables.

Practices with computer

They will be 6 practise sessions with computer 2 hours each. Mathematical software will be used to resolve them. The chosen software will allow the student to work with calculation symbolic, numeric and graphic.

Students will have in advance a manual for each session that will contain the objectives, the theoretical contents and an explanation of the mathematical software commands used to solve the proposed problems.

Works in group

Several works must be made in groups of 3 to 5 people and will be guided with interviews/seminars with Professor.

4.3.Syllabus

The course will address the following topics:

- 1. Differential calculus in one variable:**
 1. Real and complex numbers.
 2. Differentiable functions.
 3. Polynomial approximation.
 4. Numerical methods.
- 2. Integral calculus in one variable:**
 1. Techniques of integration.
 2. The definite integral.
 3. Applications of the integral.
 4. Numerical integration.
- 3. Differential calculus in several variable:**
 1. Scalar and vector fields.
 2. The gradient vector.
 3. Tangent planes and linear approximation.
 4. Maximum and minimum of two variables functions.
- 4. Multiple integrals:**
 1. Double integrals.
 2. Line integrals

4.4.Course planning and calendar

The presentation of works in the group will be always before the start of the first semester exams. The dates of the meetings with the Professor will be detailed in class. This information will be available on ADD of the course.

The planning of the practical sessions with the computer will be published at the beginning of course.

4.5.Bibliography and recommended resources