

## 29600 - Mathematics I

### Syllabus Information

**Academic Year:** 2019/20

**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**