29800 - Mathematics I

Información del Plan Docente

Academic Year	2017/18
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	Half-yearly
Subject Type	Basic Education
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

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

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

The teaching methodology will include:

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- Master classes (theory and problems) (42 hours)

- Resolution of exercises.

- Computer sessions (6 sessions of 2 hours).

- Tutorial sessions.

- Partial exam.

Final exam (3 hours).

5.2.Learning tasks

The docent methodology will include the following learning activities:

- Master classes in large groups where the knowledge that the students must acquire will be presented.

- Resolution of exercises by the student that will serve as self-evaluation and to acquire the necessary skills.

- Computer sessions oriented to practical knowledge related with the fields of the course.

- Tutorial sessions, individual and voluntary, in which students will have the possibility to ask their doubts and questions on the subject to the teacher. The time and place of these sessions will be set by the teacher at the beginning of the course.

5.3.Syllabus

Description of contents: PROGRAMME

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UNIT 1. REAL NUMBERS

- The real line. Intervals. Inequalities. Absolute value. Sets in the real line.

UNIT 2. INTRODUCTION TO COMPLEX NUMBERS

- Definition. Sum and Product. Conjugate. Modulus and Argument. Complex Exponential. Powers and Roots of Complex Numbers.

UNIT 3. LIMITS AND CONTINUITU OF FUNCTIONS OF ONE VARIABLE

- Elementary functions. Composition of functions. Inverse function. Polar coordinates and sketch of graphs of functions. Limits of functions. Definition, main theorems. Evaluation of limits. Continuous functions, properties and main theorems.

UNIT 4: DIFFERENTIAL CALCULUS IN ONE VARIABLE

- Differentiation of functions: definition, differentiation rules, interpretation. Main theorems on differentiation. Extrema of functions. Taylor polynomial: definition, main theorems. Evaluation of limits with Taylor polynomial. Approximation of functions by polynomials.

UNIT 5: INTEGRATION OF FUNCTIONS OF ONE VARIABLE

- Antiderivatives, integration rules, integration by parts and by decomposition in simple fractions. Integration by substitution and other methods to evaluate integrals. Definite integral and the fundamental theorem of calculus. Applications of integration: areas, volumes and length. Physical applications of the definite integral.

UNIT 6: FUNCTIONS OF SEVERAL VARIABLES

- Limits and continuity. Directional derivatives. Partial Derivatives. Differentiability. Derivatives and Chain Rule. Integration

5.4.Course planning and calendar

The time and place of master classes and computer sessions will be set by the Center.

The time and place of tutorial sessions will be set by the teacher at the beginning of the course.

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5.5.Bibliography and recommended resources