

Academic Year: ( 2023 / 2024 )

Review date: 01-12-2022

Department assigned to the subject: Mathematics Department

Coordinating teacher: SANTOS RODRIGO, ALEJANDRO JOSE

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 1

Branch of knowledge: Engineering and Architecture

## OBJECTIVES

The student will be able to formulate, solve and understand mathematically the problems arising in engineering. To do so it is necessary, in this first course of Calculus, to be acquainted with the real functions of one variable, their properties of continuity, derivability, integrability and their graphic representation.

The student will understand the concepts of derivative and integral and their practical applications. Also, it will manage sequences and series of real numbers and of functions that will apply to numeric approximation of functions.

## DESCRIPTION OF CONTENTS: PROGRAMME

- 1) Real numbers.
- 2) Sequences and series of real numbers
- 3) Limits of Functions. Continuity. Differentiation.
- 4) Taylor Expansions. Local Approximations. Graphical representation.
- 5) Sequences and series of functions.
- 6) Riemann Integral. Fundamental Theorem of Calculus. Integration techniques. Geometrical Applications of Integration.

## LEARNING ACTIVITIES AND METHODOLOGY

Theory (2.5 credits).

Problem sessions working individually and in groups (2.5 credits).

## ASSESSMENT SYSTEM

We follow a continuous-assessment system plus a final exam:

- The continuous-assessment part consists in three exams with a 40% weight on the final mark (20% each). The exams will take place, approximately a week after the necessary lessons have been taught and it will be held in regular class hours, according to the current regulations.

- The final exam (contributing with weight 60% to the final mark) is compulsory, and will be held at the end of the quarter.

<b>% end-of-term-examination:</b>	60
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	40

## BASIC BIBLIOGRAPHY

- Gilbert Strang Calculus, Wellesley-Cambridge Press, 1991
- HERNANDO, P. J. Clases de Cálculo I para Ingeniería, Versión 2.6, PDF, 2021
- J. Stewart Calculus, Thomson Brooks/Cole, 2009
- JUAN de BURGOS ROMAN Cálculo Integral (una y varias variables). 70 Problemas Útiles, García Maroto Editores, Madrid 2006.

#### ADDITIONAL BIBLIOGRAPHY

- Juan Diego Álvarez Román y Manuel Carretero Cerrajero Cálculo: Un enfoque práctico, Copy Red. S.A, Getafe , 2009
- R. LARSON, R. HOSTETLER y B. EDWARDS Cálculo I, Reverté, 1994.
- S.L. SALAS Y E. HILLE Calculus (primer tomo), Reverté, 1994.
- T.M. APOSTOL Calculus (2 tomos), Iberoamericana.