Calculus II

Academic Year: (2022 / 2023) **Review date: 18-05-2022**

Department assigned to the subject: Mathematics Department

Coordinating teacher: ALVAREZ ROMAN, JUAN DIEGO

Type: Basic Core ECTS Credits : 6.0

Year : 1 Semester : 2

Branch of knowledge: Engineering and Architecture

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Calculus I

OBJECTIVES

By the end of this content area, students will be able to have:
1.- Knowledge and understanding of the mathematical principles of calculus of several variables and of the basic theory of linear differential equations underlying mechanical engineering.
2.- The ability to apply their knowledge and understanding to identify, formulate and solve mathematical problems of calculus of several variables and basic linear differential equations using established methods.
3.- The ability to choose and apply relevant analytical and modelling methods in calculus of several variables as well as in basic linear differential equations.
4.- The ability to select and use appropriate tools and methods to solve mathematical problems in terms of calculus of several variables as well as in basic linear differential equations.
5.- The ability to combine theory and practice to solve mathematical problems of calculus of several variables and of the basic theory of linear differential equations.
6.- Understanding of the applicable methods and techniques applicable to calculus of several variables and to basic linear differential equations and their limitations.

DESCRIPTION OF CONTENTS: PROGRAMME

The Euclidean space. Several variables Functions. Continuity and differentiability. Polar, spherical and cylindrical coordinates. Free and conditional optimization. Iterated integration. Changes of variables. Integration along trajectories. Integration on surfaces. Computation of areas and volumes. Other applications of the integral. Introduction to differential equations.

LEARNING ACTIVITIES AND METHODOLOGY

The docent methodology will include:
- Master classes, where the knowledge that the students must acquire will be presented. To make easier the development of the class, the students will have written notes and also will have the basic texts of reference that will facilitate their subsequent work.
- Resolution of exercises by the student that will serve as self-evaluation and to acquire the necessary skills.
- Problem classes, in which problems proposed to the students are discussed and developed, that previously have worked on.
- Partial controls.
- Final control.
- Tutorials.

ASSESSMENT SYSTEM

The evaluation will be based in the following criteria:
- Two partial evaluation controls (40%).
- Final examination (60%).

% end-of-term-examination:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

BASIC BIBLIOGRAPHY

- MARSDEN, TROMBA CALCULO VECTORIAL, ADDISON WESLEY.
- NAGLE, SAFF FUNDAMENTOS DE ECUACIONES DIFERENCIALES, ADDISON WESLEY.
- SALAS, HILLE, ETGEN CALCULUS, VOLUMEN II, REVERTE.
- SPIEGEL MATEMATICAS AVANZADAS PARA INGENIERIA Y CIENCIAS, MC GRAW HILL (SERIE SCHAUM).
- STEWART CÁLCULO MULTIVARIABLE, THOMSON.