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Calculus II

Academic Year: (2023 / 2024)   **Review date: 30-05-2022**

Department assigned to the subject: Mathematics Department

Coordinating teacher: OVIAÑO GARCÍA, FRANCISCO

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 underlying automation and industrial electronics engineering.

2.- The ability to apply their knowledge and understanding to identify, formulate and solve mathematical problems of calculus of several using established methods.

3.- The ability to choose and apply relevant analytical and modelling methods in calculus of several variables.

4.- The ability to select and use appropriate tools and methods to solve mathematical problems in terms of calculus of several variables.

5.- The ability to combine theory and practice to solve mathematical problems of calculus of several variables.

6.- Understanding of the applicable methods and techniques applicable to calculus of several variables 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. Green, Stokes and Gauss theorems. Laplace transform. 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.

- Partial controls.

- Final control.

- Tutorials.

ASSESSMENT SYSTEM

The evaluation will be based in the following criteria:

- Several partial evaluation controls (40%).

- Final examination (60%).

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

BASIC BIBLIOGRAPHY

- MARSDEN, VECTOR CALCULUS, W.H. FREEMAN, 2003

- NAGLE, Fundamentals of differential equations , PEARSON-ADDISON WESLEY, 2008

- SALAS, S. Calculus : one and several variables, WILEY, 2007

- UÑA, SAN MARTIN, TOMEO PROBLEMAS RESUELTOS DE CALCULO EN VARIAS VARIABLES, THOMSON.

- ZILL ECUACIONES DIFERENCIALES CON APLICACIONES, GRUPO EDITORIAL IBEROAMERICA.

ADDITIONAL BIBLIOGRAPHY

- APOSTOL CALCULUS, John Wiley & Sons.

- LIASHKO, BOIARCHUK, GAI, GOLOVACH ANTI-DEMIDOVICH (VOL. 3 & 4), URSS.

- SIMMONS Differential equations with applications and historical notes , MC GRAW HILL, 1991