Calculus II

Academic Year: (2019 / 2020)   **Review date: 22/04/2020 11:08:03**

Department assigned to the subject: Mathematics Department

Coordinating teacher: RAMIREZ URBAN, FERNANDO

Type: Compulsory ECTS Credits : 6.0

Year : 1 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Calculus I
Linear Algebra

OBJECTIVES

In this second course of Calculus the students should acquire the mathematical background needed to understand and apply the concepts and techniques appearing in Statistics which involve several real variables. In particular they should become acquainted with functions of several variables, their properties of continuity, partial differentiability, differentiability and the calculus of double and triple integrals. Moreover, they will apply also these skills to solve optimization problems.

DESCRIPTION OF CONTENTS: PROGRAMME

1.- Vectors and scalar product. Basic topological concepts.
2.- Functions of several variables. Graphs and level sets. Limits and continuity.
3.- Partial derivatives. Directional derivatives. Differentiability: Tangent plane.
4.- Chain rule. Higher order derivatives.
5.- Quadratic approximation: Taylor's theorem.
6.- Maxima and minima. Lagrange multipliers.
7.- Double and triple integrals: properties. Iterated integrals. Changes of variables.
8.- Applications of double and triple integrals.

LEARNING ACTIVITIES AND METHODOLOGY

The course will be taught mostly through lectures, with supporting material available on the web. These classes should be complemented with the students' autonomous reading on some aspects of the syllabus, especially concerning motivation and applications.

Some of the lectures will be devoted to solving exercises singled out from the collection of exercises the students will be given at the beginning of the semester. A partial exam will be done involving continuity, diferenciability and optimization.

ASSESSMENT SYSTEM

% end-of-term-examination/test: 60

% of continuous assessment (assigments, laboratory, practicals…):   40

A partial exam will be done previous to the final exam. The final exam will cover all the subject while the partial exam will cover continuity, differentiability and optimization.

BASIC BIBLIOGRAPHY

- James Stewart Cálculo multivariable, Thomson.

- Jerrold E. Marsden, Anthony J. Tromba Cálculo Vectorial, Pearson Educación, 2004

- Ron Larson y Bruce H. Edwards Cálculo 2, Mc Graw Hill, 9ª edición 2010