

## Course Syllabus

### MULTIVARIABLE CALCULUS

Printed by: jfmoncay

Program: Telecommunications Engineering

#### 1. Course number and name

MATG1002 - MULTIVARIABLE CALCULUS

#### 2. Credits and contact hours

3 credits and 5 contact hours

#### 3. Instructor's course or coordinator's name

EBNER ALEXANDER PINEDA MOGOLLON

#### 4. Text book, title, author, and year

- Stewart, J.. Cálculo de Varias Variables (Séptima Edición)
  - a. Other supplemental materials
- Claudio Pita Ruiz. Cálculo Vectorial (Primera)

#### 5. Specific course information

- a. Brief description of the content of the course (catalog description)

Calculus of several variables is a course aimed at training professionals in the areas of engineering, natural sciences, exact sciences and social sciences, who need to develop planning and problem-solving skills in the n-dimensional context. For this purpose, the course consists of four topics: analytical geometry in three-dimensional space, differentiability of functions of several variables, multiple integration and the study of vector fields; being among the main applications of this course, the optimization of functions of several variables, the calculation of lengths, areas, volumes, work and flow, using objects of the plane and space.

- b. Prerequisites

SINGLE VARIABLE CALCULUS - MATG1001

- c. This course is: Required

#### 6. Specific goals for the course

- a. Specific outcomes of instruction

1.- Solve problems of three-dimensional analytical geometry, using surfaces, lines and planes.

2.- Analyze limits, continuity, derivability and differentiability of functions of several variables, using definitions and theorems.

3.- Solve approximation and optimization problems using gradients and differentials.

4.- Calculate integrals with vector or scalar fields, using trajectories, arc lengths, oriented surfaces, volumes and theorems of vector theory.

5.- Transform multiple integrals, using different orders of integration and changes of variables.



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b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to function on multidisciplinary teams

#### 7. Brief list of topics to be covered

- 1.- Three-dimensional analytical geometry
- 2.- Differentiation of functions of several variables
- 3.- Optimization of scalar functions of several variables
- 4.- Vector functions
- 5.- Line integrals
- 6.- Multiple integration
- 7.- Surface integrals
- 8.- Theorems of vector theory

