Course Syllabus

VECTOR CALCULUS

Printed by: lualtam

Program: Oceanographic Engineering

1. Course number and name

MATG1046 - VECTOR CALCULUS

2. Credits and contact hours

3 credits and 5 contact hours

3. Instructor's course or coordinator's name

PEDRO RAMOS DE SANTIS

4. Text book, tittle, author, and year

- Stewart, J.. Cálculo de varias variables - Trascendentes tempranas (Octava)

a.Other supplemental materials

- Thomas, G.. Cálculo varias variables (13ra.)
- Zill, D. & Wright, W.. Cálculo de varias variables (4ta.)
- Marsden, J. & Tromba., A.. Cálculo Vectorial (6ta.)
- Larson, R. & Edwards, B.. Cálculo 2 de varias variables (9 na.)
- Thomas Jr. G. Calculus (14ta edición)

5. Specific course information

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

Vector calculus is a course aimed at the basic training of professionals in the areas of Engineering, Exact Sciences and Natural Sciences who developed problem-solving and problem-solving skills in the n-dimensional context. For this purpose, the course consists of 5 general themes: three-dimensional analytic geometry and functions of several variables, differential calculus of scalar and vector fields, optimization of scalar functions of several variables, line integrals and multiple integration, surface integrals and theorems of the vector theory; being the main applications of this course: the optimization of functions of several variables applied to practical problems, the calculation of lengths, area, volumes, work and flow, using objects of the plane and space.

b. Prerequisites

SINGLE VARIABLE CALCULUS - MATG1045

c. This course is: Required

6. Specific goals for the course

a. Specific outcomes of instruction

1.- Solve three-dimensional analytical geometry problems, 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.- Solve integrals with vector and scalar fields, using trajectories, arc lengths, oriented surfaces, volumes and theorems of vector theory

5.- Transform multiple integrals, using various integration orders and variable changes

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

7. Brief list of topics to be covered

1.- Evaluation activities

2.- Three-dimensional analytical geometry and functions of several variables

3.- Differential calculus of scalar and vector fields

4.- Optimization of scalar functions of several variables

5.- Line integrals and multiple integration

6.- Surface integrals and theorems of vector theory