

## Course Syllabus

# ELECTROMAGNETIC THEORY

Printed by: jfmoncay

Program: Telecommunications Engineering

### 1. Course number and name

ELEG1002 - ELECTROMAGNETIC THEORY

### 2. Credits and contact hours

2 credits and 3 contact hours

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

OTTO ISMAEL ALVARADO MORENO

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

- Branislav M. Notaros. Electromagnetics (11 edition)
  - a. Other supplemental materials
- Branislav M. Notaros. Conceptual Electromagnetics (first edition)
- Ida, Nathan. Engineering Electromagnetics (3rd Edition)
- Tama Franco, Alberto. FUNDAMENTOS DE ELECTROMAGNETISMO (Primera)
- Hayt, W. Engineering Electromagnetics (9th edition)

### 5. Specific course information

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

This course comprises the study of electrostatic and magnetostatic fields, using different methodologies and laws to compute electric fields, potential difference, capacitance, electrical resistance, magnetic fields, magnetic flux, mutual and self-inductance, induction phenomenon. All the calculations are performed on systems with diverse configurations and varied symmetry, and that are composed of different materials.

- b. Prerequisites

DIFFERENTIAL EQUATIONS - MATG1004

PHYSICS III - FISG1003

- c. This course is: Required

### 6. Specific goals for the course

- a. Specific outcomes of instruction

1.- Calculate electric and magnetic fields on systems with different configurations and media in order to understand the operation of electromagnetic devices.

2.- Calculate electrical potential and potential difference for the analysis of electrical devices.

3.- Calculate the capacitance of symmetric systems with different arrangements and media to compute the amount of stored energy.

4.- Calculate the electrical resistance, self-inductance and mutual inductance of systems with different configurations and materials to determine the power that is dissipated by



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Joule's effect and the energy that is stored in the magnetic field.

5.- Apply the concept of magnetization and electromagnetic induction to understand the operating principle of electrical, electronic and electromechanical equipment

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
- A knowledge of contemporary issues

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

- 1.- Electrostatics and Conductors
- 2.- Electrostatics and Dielectrics
- 3.- Steady Current Fields
- 4.- Magnetostatics in a Vacuum
- 5.- Magnetostatics and Materials
- 6.- Electromagnetic Induction

