

Course Syllabus

ELECTRICAL NETWORKS ANALYSIS I

Printed by: jfmoncay

Program: Telecommunications Engineering

1. Course number and name

ELEG1003 - ELECTRICAL NETWORKS ANALYSIS I

2. Credits and contact hours

3 credits and 4 contact hours

3. Instructor's course or coordinator's name

DENNYS DICK CORTEZ ALVAREZ

4. Text book, title, author, and year

- Nilsson, James William & Riedel, Susan A.. Electric circuits (Tenth edition.);
 - a. Other supplemental materials
- Hayt, William Hart & Kemmerly, Jack E. & Steven M. Durbin. Engineering Circuit Analysis (Hardcover; 2011-09-02)
- Alexander, Charles & Sadiku, Matthew N. O.. Fundamentals of Electric Circuits (Hardcover; 2012-01-13)

5. Specific course information

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

This course studies the analysis of linear electrical networks conformed by resistors, inductors, capacitors, transformers and operational amplifiers. The study is done in state stable, in direct current and in alternating current with independent and dependent sources, of direct and alternating current. Methods of solution of electric circuits are studied based on Ohm's law and Kirchhoff's laws of voltage and current, analyzing source transformations, redundant conditions and Thevenin and Norton theorems, Superposition and maximum power transfer.

- b. Prerequisites

PHYSICS II - FISG1002

- c. This course is: Required

6. Specific goals for the course

- a. Specific outcomes of instruction
 - 1.- Apply basic electrical techniques and conventions to simplify electrical networks.
 - 2.- Apply the methods of currents of meshes and voltages in the nodes for the solution of a circuit both in direct current and in alternating current using conventional methods.
 - 3.- Analyze the characteristic of a charge through the Thévenin and Norton Theorem for the determination of the maximum power transfer condition.
 - 4.- Analyze a polarized circuit with alternate sources in the frequency domain using phasor methods, including magnetically coupled circuits, to obtain the variables of currents



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and voltages in the elements of the network.

5.- Calculate the values of voltages and currents through the use of analysis techniques in alternating current circuits for the determination of electrical parameters.

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 use the techniques, skills and modern tools necessary for engineering

practice

7. Brief list of topics to be covered

- 1.- BASIC COMPONENTS AND ELECTRICAL CIRCUITS.
- 2.- NETWORK ANALYSIS IN CONTINUOUS CURRENT.
- 3.- THE OPERATIONAL AMPLIFIER.
- 4.- STABLE SENOIDAL ANALYSIS.
- 5.- POWER AND ENERGY IN ALTERNATE CURRENT
- 6.- MAGNETIC COUPLING AND COUPLED CIRCUITS

