NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
EGR 251- BASIC ELECTRIC CIRCUITS I (3 CR.)

Course Description

Teaches fundamentals of electric circuits. Includes circuit quantities of charge, current, potential, power, and energy. Teaches resistive circuit analysis; Ohm's and Kirchoff's laws; nodal and mesh analysis; network theorems; and RC, RL, and RLC circuit transient response with constant forcing functions. Teaches AC steady-state analysis, power, and three- phase circuits. Presents frequency domain analysis, resonance, Fourier series, inductively coupled circuits, Laplace transform applications, and circuit transfer functions. Introduces problem solving using computers. Lecture 3 hours per week.

General Course Purpose

These courses will introduce the prospective electrical engineering student to the tools of circuit analysis in the time and frequency domains, utilizing such powerful techniques as LaPlace transforms and Fourier series. It will serve as the foundation for all later work in circuit analysis and design, as well as many other areas in electrical engineering.

Course Prerequisites/Corequisites

Prerequisite: MTH 264. Corequisite: PHY 231.

Course Objectives

To provide the student with the fundamental tools of circuit analysis in the time and frequency domains: Ohm's and Kirchhoff's Laws, nodal and mesh analysis, linear network theorems, first and second order circuits utilizing differential equations, LaPlace transforms, phasors and Fourier series.

Major Topics to be Included

       a) Introduction; circuit quantities
       b) Resistive networks
       c) Dependent sources; operational amplifiers
       d) Nodal and mesh analysis
       e) Linear network theorems
       f) Capacitance and inductance
       g) First order circuits (RC & RL)
       h) Second order circuits (RLS and others)
       i) LaPlace transforms in transient analysis