NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
ELE 211 – ELECTRICAL MACHINES I (4 CR.)

Course Description

Studies the construction, theory of operations and applications of DC and AC machines.
Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

General Course Purpose

This course is designed to teach students the basic concepts in electrical machines, such as AC and DC motors, transformers, generators, and pumps. This course will also teach students about major control components used with electrical machines, such as relay and solenoids, frequency drives and PLCs. Students will also learn machine alignment using state of the art mechanical systems trainers.

Course Prerequisites/Corequisites

Prerequisites: ELE 146 and ELE 150.

Course Objectives

Upon completing the course, the student will be able to:

- Review of basic DC and AC Circuits
- DC vs. AC Machines
- Magnetic field and use of magnetic field to make efficient machines
- DC Motors detailed discussion
- Fundamental parameters of DC motors, such as torque, speed, voltage and current
- AC Machines
- Single Phase and 3-Phase AC Motors
- Torque vs Speed Characteristics of AC Motors
- Pratical applications of AC motos
- DC and AC Generators
- 3 Phase Generators
- Transformers
- Relays, Solenoids
- Pumps and Vavles
- Alignment of Motors using Mechnaicl Traniers
- Controls of Electrical machnies usnig Frequency Drives and PLCs

Major Topics to be Included

- Review of electrical quantities, Electrical Safety
- AC/DC motors
- DC Motor Types
- DC Motor Parameters
- AC Motor Types
- Single Phase AC Motors
- 3 phase AC Motors
- Torque VS speed parameters of AC Motor
- Generators
- 3 Phase power generation using generatots
- Pumps and Valves
- Motor Alignment
- Solenoids and relays
- Frequency Drives, Programmable Logic Controllers (Brief introduction) as they applied to control of AC Machines