NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
ELE 146 – ELECTRIC MOTOR CONTROL (4 CR.)

Course Description

Studies solid state devices with application and emphasis toward control of power. Includes diodes, SCR's, photoelectric controls, timing, circuits, voltage regulation and three phase rectifiers. Lecture 3 hours. Laboratory 3 hours. Total 6 hours per week.

General Course Purpose

This course is designed to teach students the basic concepts of electrical motor controls such as controlling motor speed, direction, timing, stopping and starting. This course will utilize frequency drives for modern control and PLC aspect of motor control. This course will teach students to apply theory to read control prints, design and construct motor control circuits, the correct use of discrete control components such as contactors, overload relays, timers, input and output devices, frequency drives and PLCs (PLC for motor controls).

Course Prerequisites/Corequisites

Prerequisite: ELE 150 or equivalent.

Course Objectives

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

- Analyze ladder logic diagrams as they apply to electric motor controls applications.
- Describe the basic input and output devices used in motor control systems.
- Construct motor control circuits to operate various motors.
- Test and troubleshoot motor control circuits to determine the faulty components.
- Demonstrate techniques for reversing starters, braking methods, and reduced voltage starting (4 Different methods)
- Describe the operation of basic motors
- Demonstrate the application of frequency drives and PLCs in motor control
- Describe the safety requirements associated with installing, testing, troubleshooting and repair of motor control circuits.

Major Topics to be Included

- Review of electrical quantities, Electrical Safety
- AC/DC motors
- Motor Control Diagrams
- OPCD, Overload relays
- Solenoids & Transformers
- Starting/Stopping Motors
- Control Devices, Manual, Magnetic and automatic switches, Sensors
- Reversing Motors
- Motor Braking Methods
- Solid State Devices, Reduced Voltage Starters, Soft Start
- Timers/Counters, ON/OFF Timers
- Sensing Devices
- Frequency Drives, Programmable Logic Controllers (Brief introduction)