NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
AIR 251 – AIR CONDITIONING SYSTEMS I (4 CR.)

Course Description

Studies air conditioning, sizing selection, and application, servicing, repairing of coils and compressors. Includes troubleshooting the cooling system. Studies piping design and sizing, installation, condensers and water towers. Includes valves, strainers and accessories, duct systems and air distribution design and their relationship with volume, static pressure and velocity. Part I of II. Lecture 3 hours. Laboratory 3 hours.

General Course Purpose

Prepares the student to be able to evaluate and solve problems involving coil construction, capacities, selection, and repair. Also to evaluate and diagnose technical problems associated in the design, installation, and repair/replacement of residential and commercial air conditioning systems.

Course Prerequisites/Corequisites

Prerequisites: AIR 122 and AIR 134

Course Objectives

Upon completion of this course, the student should be able to:

- Describe refrigerant properties and demonstrate their proper and safe usage
- Demonstrate the ability to use charts and tables in making calculations of air properties and quantities
- Calculate system and component capacities
- Determine refrigeration effect
- Determine refrigerant quantity (GPM) flow through piping
- Explain the relationship between the components of a system
- Repair a damaged coil
- Evaluate residential and commercial refrigeration systems
- Install or repair existing residential or commercial air conditioning systems
- Evaluate capacity control systems and methods of capacity control
- Calculate the correct size of system components by using the appropriate tables and charts
- Use equipment charts and tables to determine the correct piping sizes, wire sizes, and system refrigerant charge
- Demonstrate an in-depth knowledge of the various refrigerant flow control devices including multi-evaporator operation
- Describe the various components of a commercial air conditioning system

Major Topics To Be Included

- Refrigeration properties
- Refrigerant tables
- Absolute - Gauge - Partial pressures
- Specific volume - specific density of refrigerants
- Enthalpy of various refrigerants
- Weight of refrigerant to be circulated
- Calculating the refrigerant effect
- Calculating the coil compressor efficiency
- Determining the effects of superheat -subcooling
- Evaluating the system components
- Determining fluid flow through evaporators /condensers
- Determining pressure drop through evaporators
- Determining refrigerant pipe size and installation procedure