

NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
AIR 121 – PRINCIPLES OF REFRIGERATION I (4 CR.)

Course Description

Studies refrigeration theory, characteristics of refrigerants, temperature, and pressure, tools and equipment, soldering, brazing, refrigeration systems, system components, compressors, evaporators, metering devices. Presents charging and evaluation of systems and leak detection. Explores servicing the basic system. Explains use and care of oils and additives and troubleshooting of small commercial systems. Part I of II. Lecture 3 hours. Laboratory 3 hours.

General Course Purpose

Students will discover what opportunities are available to them in the HVACR industry, as well as what will be required of them to succeed.

Course Prerequisites/Corequisites

Prerequisite or Corequisite: SDV 100

Course Objectives

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

- Braze, solder, and flare refrigeration tubing
- Recover refrigerant from a system and recycle it back into the same system
- Evacuate and charge a refrigeration system
- Apply the basic principles of refrigeration to practical applications
- Apply the various gas laws where needed
- Interpret and use as needed the refrigeration pressure-temperature tables
- Understand and use absolute pressures and temperatures in working with gas law formulas for refrigeration problems
- Diagram the basic refrigeration cycle
- Construct and make functional a basic refrigeration system
- Detect refrigerant leaks
- Charge and discharge a system
- Wire the basic refrigeration system
- Apply good customer relations skills

Major Topics To Be Included

- Brazing, soldering, and flaring
- Refrigerant recovery
- Evacuation and charging
- Safety procedures used in laboratory and in the field
- Energy
 - sources
 - measurements
 - control
- Heat transfer and heat transfer methods
- Pressure-temperature relationship and charts
- Gas laws and their applications
- The refrigeration cycle (mechanical cycle only)
- System components
 - compressors

- evaporators
 - condensers
 - metering devices
- Systems
 - air to air
 - air to water
 - indirect
 - double indirect
- Controls
 - temperature
 - pressure
 - oil
- Customer Service

Extra Topics (Optional)