

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
AIR 235 – HEAT PUMP (4 CR.)**

Course Description

Studies theory and operation of reverse cycle refrigeration including supplementary heat as applied to heat pump systems, including service, installation and maintenance. Lecture 3 hours. Laboratory 3 hours.

General Course Purpose

This course is designed to prepare students for employment in the refrigeration and air conditioning field.

Course Prerequisites/Corequisites

Prerequisites: AIR 122 and 134

Course Objectives

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

- Perform tests to determine proper air flow
- Test heat pumps in the cooling mode for correct charge
- Test heat pumps in the heating mode for correct charge and BTU output
- Evaluate and confirm defrost systems
- Compare R22 to R410A systems

Major Topics To Be Included

- Electric resistance heat
 - Types of heaters
 - Line and low voltage control
 - Thermostats indoor and outdoor
- Air system check
 - Temperature rise method
 - Total CFM
 - Auxiliary heat
- Basic principles
 - Reverse cycle
 - Air and water source
 - Electrical control
- Refrigeration cycle components
 - Compressors and reversing valves
 - Metering devices and check valves
 - Accumulators and heat exchangers
- Heat pump installation
 - Split and package systems
 - Line set leak testing
 - Power and control wiring
- Start up and check out
 - Air system test
 - Superheat and subcooling test
 - System capacity test
- Troubleshooting
 - Refrigeration problems
 - Electrical problems
 - Defrosting problems
- Other heat pump systems
 - Liquid to air
 - Air to liquid
 - Liquid to liquid
 - Dual fuel

Extra Topics (Optional)