**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)**

-