

# Virginia Western Community College

## AIR 121

### Air Conditioning & Refrigeration I

#### **Prerequisites**

Prerequisite(s): MTE 1 , MTE 2 and MTE 3 or equivalent. Pre/Co-requisite(s): ELE 130 or ELE 133 .

#### **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.

**Semester Credits: 3 Lecture Hours: 2 Lab/Clinical/Internship Hours: 2**

#### **Required Materials**

##### **Textbook:**

**Modern Refrigeration, 20th edition, ISBN#: 9781631263545**

##### **Other Required Materials:**

Calculator (T130 series recommended; must have trig functions (SIN, TAN, COS) and a square root key); Safety glasses must be provided by the student and are required to be worn at all times while in the lab.

#### **Course Outcomes**

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

- A. Explain the operation of a simple mechanical refrigeration system, name and describe each part of the system and each line in the system.
  
- B. Define or explain:
  - 1. Heat
  - 2. Temperature
  - 3. Absolute Zero
  - 4. Pascal's Law
  - 5. Mass
  - 6. Pressure
  - 7. Solid, Liquid, and Gas
  - 8. British Thermal Unit (BTU)
  - 9. Specific Heat
  - 10. Latent Heat
  - 11. Sensible Heat
  - 12. Heat Transfer
  - 13. Vacuum
  - 14. Ton of Refrigeration

- C. Work mathematically:
  - 1. Areas and volumes
  - 2. Fahrenheit and Celsius temperature conversions
  - 3. Work specific and latent heat problems
  - 4. Diameter vs. RPM for pulleys
  
- D. Perform the following:
  - 1. Connect the gauge manifold to a system, read and interpret the gauge readings.
  - 2. Connect copper tubing by flaring, swaging, and silver brazing.
  - 3. Use a pressure-temperature card to convert system pressures to temperatures and vice-versa.

### **Topical Description**

### **Notes to Instructors**

None