

Revised: Fall 2016

Air Conditioning and Refrigeration I

AIR-121

COURSE OUTLINE

Prerequisites:

Prerequisites MTE 1, 2, and 3 or equivalent; Pre or Co-requisite: 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 and troubleshooting of small commercial systems.

Semester Credits: 3 Lecture Hours: 2 Lab/Recitation Hours: 2

VIRGINIA WESTERN COMMUNITY COLLEGE
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(540)-857-7273



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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 | 8. British Thermal Unit (BTU) |
| 2. Temperature | 9. Specific Heat |
| 3. Absolute Zero | 10. Latent Heat |
| 4. Pascal's Law | 11. Sensible Heat |
| 5. Mass | 12. Heat Transfer |
| 6. Pressure | 13. Vacuum |
| 7. Solid, Liquid, and Gas | 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 vise-versa.



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Required Materials:

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

Textbook:

Modern Refrigeration & Air Conditioning, by Althouse, 19th edition, ISBN: 978-1-619-60199-4

The following supplementary materials are available:

- 1.
- 2.
- 3.

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Topical Description: (Outline chapters and sections to be covered in the book – may include timeline)

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Notes to Instructors

(List information about optional topics, departmental exams, etc)

- 1.
- 2.
- 3.
- 4.

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