

COURSE PREFIX:	ACR 108
COURSE TITLE:	Refrigeration Fundamentals
LEC HRS/ WEEK:	2.0
LAB HRS/WEEK:	3.0
CREDIT HRS/SEMESTER:	3.0

Distance Learning Attendance/VA Statement
Textbook Information

COURSE DESCRIPTION:

This course is an introduction to the principles of refrigeration.

COURSE COMPETENCIES:

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

Module 1: Introduction

- Explain the history of air conditioning and refrigeration
- Determine career opportunities in the HVACR industry
- Describe the role of Trade organizations
- Define air conditioning and refrigeration

Module 2: Theory of Heat

- Define temperature
- Make conversions between Fahrenheit and Celsius scales
- Describe molecular motion at absolute zero
- Define the British Thermal Unit
- Describe heat flow between substances of different temperatures
- Explain the transfer of heat by conduction, convection, and radiation
- Discuss sensible heat, latent heat and specific heat
- State atmospheric pressure at sea level and explain why it varies at different elevations
- Describe two types of barometers
- Explain psig and psia as they apply to pressure measurements

Module 3: Matter and Energy

- Define matter
- List the three states in which matter is commonly found
- Define density
- Discuss Boyle's Law
- State Charles' Law
- Discuss Dalton's Law as it relates to the pressure of different gases
- Define specific gravity and specific volume
- State two forms of energy important to the air conditioning (heating and cooling) and refrigeration industry
- Describe work and state the formula used to determine the amount of work in a given task

- Define horsepower
- Convert horsepower to watts
- Convert watts to British Thermal Units

Module 4: Refrigeration and Refrigerants

- Discuss the mechanical compression cycle
- Discuss applications for high-, medium- and low-temperature refrigeration
- Describe the term *ton of refrigeration*
- Describe the basic refrigeration cycle
- Explain the relationship between pressure and the boiling point of water or other liquids
- Describe the function of the evaporator or cooling coil
- Explain the purpose of the compressor
- List the compressors normally used in residential and light commercial buildings
- Discuss the function of the condensing coil
- State the purpose of the metering device
- List four characteristics to consider when choosing a refrigerant for a system
- List the designated colors for refrigerant cylinders for various types of refrigerants
- Describe how refrigerants can be stored or processed while refrigeration systems are being serviced
- Plot a refrigeration cycle for refrigerants (R-22, R-410A, R-134A) on a pressure/enthalpy diagram

STANDARDS:

Assignments and attendance must be completed as designated in “Evaluation Strategies/Grading.”
Criteria for minimal acceptable performance will be provided by the instructor.

REQUIREMENTS:

Attendance Policy

The college attendance policy stated in the college handbook will be honored. The instructor will provide specific requirements for the course.

Academic Honesty

Students are expected to adhere to the college policy regarding student conduct as stated in the college handbook.

Assignments

Students are expected to complete all assignments and any supplementary exercises designated by the instructor.

EVALUATION STRATEGIES/GRADING:

Students must complete all modules, including assignments, projects, labs, and tests. Students must earn at least a “C” in order for the course to serve as a prerequisite and for the course to apply towards a certificate.

Grading Scale:

A = 90 – 100
B = 80 – 89.9
C = 70 – 79.9
D = 60 – 69.9
F = 00 – 59.9

Evaluation Method:

Tests/Projects (minimum of one)	8% of Module One <u>+2%</u> of Module One 10%
Tests/Projects (minimum of three total) Work Attitude	25% of Module 2-4 <u>+5%</u> of Module 2-4 30%
	10% Module One
	Plus <u>30% (X 3)</u> Modules 2-4
	100% Final Grade

Work Attitude is defined as:

Participation	Responsibility
Cooperation	Professionalism
Appearance	Attendance
Effort	Self Motivation
Safety	Works Independently

Entry-Level Skills

The student must be able to read and solve basic mathematical equations.

Prerequisites

RDG 031 or equivalent, ACR 102

Co-Requisites

None

Methods of Instruction:

Lectures, reading assignments, projects, discussions, video presentations, multi-media presentations, and web content are the major teaching methods used in this course. See instructor for specifics.

Effective Date: SU06