

Mercer County Community College  
Business & STEM Division

Course Outline

HRA202  
Course Number

Light Commercial Systems I  
Course Title

Credits 2

Class Hours 1

Laboratory 2

TEXT:

Refrigeration & Air Conditioning Technology  
4th Edition

Authors: Whitman, Johnson, Tomczyk

ISBN: 076680667-7

Publisher: Thompson Learning

15 Weeks  
Length of Semester

Catalog Description

Fundamental requirements for locating, wiring, piping, troubleshooting, and operating performance of low temperature and medium temperature light commercial refrigeration equipment.

Pre-requisite:HRA 102, HRA 103

Co-requisite: None

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Latest Review: Spring 2019

## Course Objectives:

This course in Commercial Systems is intended to provide the student with the basic knowledge of the requirements of a total installation and start-up of small commercial refrigeration systems as well as troubleshooting techniques.

The student will be able to...

1. select the proper location for condensing unit and fixture.
2. install fixture condensate drain.
3. field wire condensing unit and fixture.
4. select and install necessary tubing.
5. leak check, evacuate and charge system.
6. start-up unit and set system controls as required.
7. use recovery equipment as needed for repairs.

## UNIT I (5 nights) – Locate Unit and Piping

### Specific Objectives:

The student will be able to...

1. set refrigeration fixture in accordance with manufacturer's specifications and connect condensate drain.
2. locate refrigeration condensing unit and perform electrical check of unit and fixture.
3. select from industry data liquid and suction line sizes.
4. evaluate from manufacturer's data compressor capacity and fixture requirements.
5. install, insulate, leak check and evaluate entire system.

### Instructional Content and Methods:

1. Students will be supplied with manufacturer's information on fixture and system to be installed. All information will be reviewed during the lecture periods.
2. Two systems will be positioned, piped, leak checked and evacuated during laboratory periods.
3. Videos and overhead transparencies will be used to highlight difficult areas.

### Evaluation:

One written evaluation and one laboratory evaluation will be administered covering this material.

## UNIT II (4 nights) System Wiring

### Specific Objectives:

The students will be able to...

1. explain the function of all electrical components in the system.
2. duplicate from memory the wiring diagram for the system being installed.
3. troubleshoot malfunctions in all components in the system.
4. completely field wire a small commercial refrigeration system, including wire size selection.

### Instructional Content and Methods:

1. During instructional periods, instructor will review wiring requirements of each system being worked on and students will provide a complete wiring diagram to instructor before wiring units.
2. Students will physically wire two complete small commercial refrigeration systems.

### Evaluation:

One written and one performance test will be given.

## UNIT III (6 nights)-Starting, Charging and Setting System Controls

### Specific Objectives:

The student will be able to...

1. properly charge a small refrigeration system.
2. set all pressure switches, thermostats, defrost timer and refrigeration devices properly.
3. check total system for normal operation in refrigeration and defrost modes.
4. use recovery equipment to facilitate needed repairs.

### Instructional Content and Methods:

1. During instructional periods manufacturer's data and overhead transparencies will be used to show function, location and settings of each control device. Actual controls will be used during classroom dissertations to show each student how adjustments are made
2. Laboratory periods will be used for location of controls in each system and actual setting of controls on operating systems.

## Course Evaluation and Grading:

While the exact procedure for grading will be up to the individual instructor, the following guidelines will apply:

1. A written final examination covering all material presented in the course will be given to each student before he or she can successfully complete the course.
2. Final grade will be determined by evaluating final examination results, test results (a minimum of three test scores, other than the final examination will be given), laboratory performance and attendance.
3. Extra credit work will generally not be considered recognized in evaluating student performance, however, individual instructors do have limited flexibility in recognizing additional effort and performance by an individual student.