

Course Outline

HRA-203
Course Number

Light Commercial Systems II
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

A comprehensive practical course covering electrical ladder diagrams, controls, control settings, accessory equipment and methods of controlling refrigeration temperatures as they pertain to light commercial refrigeration equipment.

Prerequisite: HRA 202

Co-requisite: None

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Latest Review: Spring 2019

Course Objectives:

This course in light Commercial Systems is intended to provide the student with a more in-depth knowledge of control and accessories required on this type of equipment. Emphasis is placed on electrical ladder diagrams with their numerous electrical circuits and controls.

The student will be able to...

1. draw a ladder diagram of a given refrigeration electrical system,
2. use the ladder diagram as a basis and means for doing electrical and mechanical troubleshooting on a given system,
3. revise, if necessary, a ladder diagram to accept additional control or to incorporate newer electronic controls,
4. select, install, and set electro-mechanical and newer electronic controls and explain their operation.

UNIT I (7 nights) – Ladder Electrical Diagrams

Specific Objectives:

The student will be able to...

1. draw a ladder diagram of the "blue" Hill freezer case system.
2. explain the function of all the individual circuits in this diagram.
3. explain the function of all the controls and relays in each circuit.
4. use a voltmeter and ampere meter to test the operation of controls and motors in each circuit and diagnose any existing problems with either.

Instructional Content and Methods:

1. Caulkboard demonstration will be used to show students the methods of making a ladder diagram.
2. Numerous diagram handouts will be supplied to students to assist in drawing ladder diagrams.

Evaluation:

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

UNIT II (8 nights) Installation, Operations and Adjustment of

Controls. Specific Objectives:

The students will be able to...

1. become familiar with the operation and adjustment of time clocks, pressure controls, temperature controls, contactors, start relays, and capacitors.
2. make installations and adjustment of each of the following; a compressor oil pressure failure control, an electronic 3 phase voltage monitor control and several electronics temperature controls.
3. make installation of a voltage boosting transformer. The students will take voltage and amperage readings to understand how low voltage and how proper voltage will affect a motors operation.

Instructional Content and Methods:

1. all above control work will be done in conjunction with ladder diagrams so that students will gain a good understanding how these controls function in a refrigeration systems operation.
2. Manufacturers handouts will be used extensively to illustrate control

function. Evaluation:

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

Course Evaluation and Grading:

While the exact procedure for grading will be up to the individual instructor the following 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 will generally not be considered when evaluating student performance, however, individual instructors do have limited flexibility in recognizing additional efforts and performance by an individual student.