

I. CATALOG DESCRIPTION:

A. Department Information:

Division: Refrigeration and Air Conditioning
Department: Refrigeration and Air Conditioning
Course ID: REFRIG 067A-Z
Course Title: Controls II
Units: 3
Lecture: 3 Hours
Prerequisite: None

- B. Course and Schedule Description: This is the second term of a three-term national training course offered in conjunction with the Refrigeration Service Engineers Society and is a comprehensive study of refrigeration electric controls. This course is designed to help certify journeymen-level refrigeration technicians and keep their knowledge current. Department Advisory: HVAC Refrigeration work experience

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon completion of this course, students will be able to:

- A. Debate basic control theory.
- B. Distinguish between power supplies, relays, and sensors.
- C. Test low voltage controls, high voltage controls, and modulating controls.
- D. Categorize safety practices.
- E. Analyze system applications.
- F. Evaluate electric control system maintenance.

IV. CONTENT:

- A. Basic Control Theory
 - 1. Power supplies and wiring
 - 2. Relays
 - 3. Sensors
 - 4. Low voltage controls
 - 5. High voltage controls
 - 6. Modulating controls
 - 7. Control valves
 - 8. Control dampers
- B. Safety
- C. System Applications
 - 1. Parts 1-6
- D. Control Maintenance
- E. Manufacturer's Technical Data
 - 1. Barber
 - 2. Honeywell
 - 3. Johnson
 - 4. Ranco
 - 5. Robertshaw
 - 6. White

V. METHODS OF INSTRUCTION:

Methods of instruction will vary from instructor to instructor but may include:

- A. Lectures and discussions about basic control theory, power supplies, voltage controls, control valves, control maintenance and manufacturer's technical data.

- B. Lectures and discussions are complemented with handouts, show and tell demonstrations and instruction on troubleshooting.
- C. Dynamics are accented with the use of pictures, charts and videos.
- D. Homework is assigned to promote expertise, vocabulary and writing skills.

VI. TYPICAL ASSIGNMENTS:

Typical assignments will vary from instructor to instructor but may include:

- A. Why are electrical control contacts designed to open and close rapidly?
- B. Describe the method use to test the defrost limit switch.
- C. What is the purpose of delaying the operation of the evaporator fans upon termination of the defrost cycle?

VII. EVALUATION:

A. Methods of evaluation will vary from instructor to instructor but may include:

- 1. Written tests
- 2. Final exam

Typical Questions:

- a. What is the purpose of controls?
- b. What does the power supply do?

B. Frequency of evaluation will vary from instructor to instructor but may include:

- 1. Three (3) written tests
- 2. One (1) final exam

VIII. TYPICAL TEXT:

Refrigeration Service Engineers Society, RSES Controls, Refrigeration Service Engineers Society, Des Plaines, IL, 2002

IX. OTHER SUPPLIES REQUIRED OF STUDENTS: None