

**I. CATALOG DESCRIPTION:**

A. Department Information:

Division: Refrigeration and Air Conditioning  
Department: Refrigeration and Air Conditioning  
Course ID: REFRIG 051A-Z  
Course Title: Refrigeration and Air Conditioning 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 compressors, condensers, and accessories. 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, the student will be able to:

- A. Examine pressure and enthalpy diagrams.
- B. Assess heat loads.
- C. Compare and describe the different compressor applications and installations.
- D. Classify the different condenser types.
- E. Distinguish between the different evaporators.
- F. Test capacitors and protectors.
- G. Consider the refrigeration processes as applied to fresh meats, beverages, and ice machines.

**IV. CONTENT:**

- A. Diagrams
  - 1. Understanding and applying pressure and enthalpy diagrams
  - 2. Estimating the heat load
- B. Compressors and Condensers
  - 1. Hermetic and semi-hermetic compressors
  - 2. Air-cooled refrigeration condensers
  - 3. Water-cooled condensers
  - 4. Evaporative condensers and cooling towers
- C. Water Treatment
  - 1. Water treatment
  - 2. Closed circuit water coolers
  - 3. Food store room requirements
- D. Refrigerant Controls
  - 1. The capillary tube
  - 2. The thermostatic expansion valve
- E. Refrigeration Evaporators
  - 1. Evaporator operation
  - 2. The electric motor in refrigeration
- F. Motor Capacitors and Protectors
- G. Defrosting Methods
- H. Ice Machines and Dispensers

San Bernardino Valley College  
Curriculum Approved: February 4, 2002

1. Cube icemakers
  2. Flake icemakers
  3. Ice cream and milk dispensers
- I. Refrigeration System Piping
  - J. Refrigeration System Accessories

**V. METHODS OF INSTRUCTION:**

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

- A. Lectures and discussions about pressure/temperature relationships, heat loads, compressor applications, condenser types, evaporator types, and testing procedures.
- B. Lectures and discussions are complemented with handouts and instruction on different methods of testing and troubleshooting.
- C. Dynamics are accented with graphs 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. Describe the function of a metering device in a refrigeration system.
- B. Explain the method of operation of a capillary tube, automatic expansion valve, and thermostatic expansion valve.
- C. Describe the proper method for determining superheat and explain how it is used in troubleshooting and evaluating a sealed system.

**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 commonly used to produce flake ice?
- b. What is the advantage of forced circulation evaporators?

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 Refrigeration and Air Conditioning, Refrigeration Service Engineers Society, Des Plaines, IL, 2002. (*The Refrigeration Service Engineers use their own book.*)

**IX. OTHER SUPPLIES REQUIRED OF STUDENTS: None**