San Bernardino Valley College
Curriculum Approved: February 4, 2002

I. CATALOG DESCRIPTION:

A. Department Information:

Division:	Refrigeration and Air Conditioning
Department:	Refrigeration and Air Conditioning
Course ID:	REFRIG 061A-Z
Course Title:	Refrigeration and Air Conditioning Electricity 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 alternating current and applications. 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. Compare the fundamentals of alternating current.
B. Describe the physical properties of inductance and capacitance.
C. Contrast inductive reactance and capacitive reactance.
D. Describe how transformers work and their application.
E. Select alternating current instruments and demonstrate their use.
F. Diagram troubleshooting techniques used on an AC circuit.
G. Test and repair single-phase motors.

IV. CONTENT:

A. Plant Engineering
   1. Taking the mystery out of electrical schematics
   2. Inside wiring circuits
B. Introduction to Alternating Current
   1. Single phase motor schematics
   2. Inductance and capacitance
   3. Motor capacitors
   4. Inductive and capacitive reactance
   5. Fundamental alternating current circuit theory
   6. Transformers
C. Alternating Current Motors
   1. Single phase motors testing
   2. Test and repair of electric motors
   3. Motor protection
D. Alternating Current Instruments
   1. Troubleshooting hermetic compressors
   2. Troubleshooting industrial controls
E. Standard Service Techniques
F. Typical Starting Switches Wiring Diagrams

V. METHODS OF INSTRUCTION:

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

A. Lectures and discussions about alternating current fundamentals, inductance, capacitance, reactance, transformers, motors, AC tools and troubleshooting techniques.

B. Lectures and discussions are complemented with handouts and instruction on troubleshooting.
C. Dynamics are accented with the use of pictures, 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. Name several conditions to which test meters are sensitive.
B. How is the ammeter set when the circuit is unknown?
C. What is the wattage of a compressor with a motor operating at 230 volts drawing 27.5 amperes?

VII. EVALUATION:

A. Methods of evaluation will vary from instructor to instructor but may include:
   1. Written tests
   2. Final exam
      Typical Questions:
      a. How do you use an ohmmeter to check for continuity?
      b. Calculate the reactance of a motor winding, 25H @ 60Hz.

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 Electricity, Refrigeration Service Engineers Society, Des Plaines, IL, 2002

I**X. OTHER SUPPLIES REQUIRED OF STUDENTS:** None