

**NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
AIR 134 - CIRCUITS AND CONTROLS I (3 CR.)**

Course Description

Presents circuit diagrams for air conditioning units, reading and drawing of circuit diagrams, types of electrical controls. Includes analysis of air conditioning circuits, components, analysis and characteristics of circuits and controls, testing and servicing. Introduces electricity for air conditioning which includes circuit elements, direct current circuits and motors, single and three-phase circuits and motors, power distribution systems, and protective devices. Studies the electron and its behavior in passive and active circuits and components. Demonstrates electronic components and circuits as applied to air conditioning system. Part I of II. Lecture 2 hours. Laboratory 2 hours.

General Course Purpose

This course is designed to provide the student with theory and practical experience needed to understand electric wiring diagrams, and be able to connect motors, controls, and safety devices properly. It studies AC motors and controls, power transmission and distribution, pictorial and schematic circuit diagrams used in air conditioning, refrigeration, and heating for home, commercial, and light industrial installations.

Course Prerequisites/Corequisites

Prerequisite: AIR 111

Course Objectives

Upon completion of this course, the student should be able to:

- Safely work with electricity in an entry level position in the HVACR industry
- Identify and troubleshoot electrical circuits
- Calculate wire size for given load requirements
- Demonstrate a sound comprehension of theory and principles of electric wiring diagrams used in refrigeration systems
- Draw various wiring diagrams for refrigeration air conditioning and heating systems
- Wire basic controls and loads
- Use the material and testing equipment as they apply to electric wiring diagrams and various controls; and
- Utilize various electrical meters to test transformers, motors, motor starting devices, and motor controls

Major Topics to Be Included

- Motor principles
- Types of electric motors
- Motor starting circuits and controls (relays, contactors and overloads)
- Hermetic compressors and starting relays
- Thermostats and pressure switches
- Gas, oil, and electric heating controls and wiring
- Air conditioning and heat pump controls and wiring
- Troubleshooting control devices
- Commercial and industrial air conditioning systems and wiring
- Commercial cooler, freezer, ice machine systems and wiring
- Troubleshooting HVACR electrical systems

Extra Topics (Optional)