Air Conditioning Control Principles (HART 1403)

Credit: 4 semester credit hours (2 hours lecture, 6 hours lab)

Prerequisite/Co-requisite: None.

Course Description

A study of HVAC and refrigeration controls; troubleshooting of control components; emphasis on use of wiring diagrams to analyze high and low voltage circuits.

Required Textbook and Materials

1. Electricity for Refrigeration, Heating and Air Conditioning by Russell E. Smith, 8th edition.
   a. ISBN number is 10: 1-111-03874-0
2. Modern Refrigeration and Air Conditioning by Althouse, Turnquist, and Bracciano, 18th edition
   a. ISBN number is 1590702808

Course Objectives

Upon completion of this course, the student will be able to

1. Read HVAC and Refrigeration control circuits. (SCANS C5.2, C6.4, C7.3, C9.3, C10.1, C14.5, C20.3, F1.3, F2.6, F4.3, F7.5, F9.4, F11.2, F12.3)
2. Troubleshoot control components. (SCANS C5.2, C6.4, C7.3, C9.3, C10.1, C14.5, C20.3, F1.3, F2.6, F4.3, F7.5, F9.4, F11.2, F12.3)
3. Analyze high and low voltage circuits with the use of wiring diagrams. (SCANS C5.2, C6.4, C7.3, C9.3, C10.1, C14.5, C20.3, F1.3, F2.6, F4.3, F7.5, F9.4, F11.2, F12.3)

SCANS Skills and Competencies

Beginning in the late 1980's, the U.S. Department of Labor **S**ecretary's **C**ommission on **A**chieving **N**ecessary **S**kills (SCANS) conducted extensive research and interviews with business owners, union leaders, supervisors, and laborers in a wide variety of work settings to determine what knowledge workers needed in order to perform well on a job. In 1991 the Commission announced its findings in *What Work Requires in Schools.* In its research, the Commission determined that "workplace know-how" consists of two elements: foundation skills and workplace competencies.

Course Outline

A. Safety
   1. Operation of a volt ohm meter
   2. Safety equipment required
   3. Identification of low voltage circuits
B. Interpret high and low voltage control circuits

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1. reading of control circuit diagrams
2. wiring of low voltage circuits
3. step down transformer principles

C. Test, repair, replace HVAC-related electrical components
1. Identify relate characteristics
2. Identify contactor characteristics
3. Troubleshoot low voltage circuits

Grade Scale

A = 90-100

B = 80-89

C = 70-79

D = 60-69

F = 0-59

Course Evaluation

1. 4 Tests	33%
2. Comprehensive Final	33%
3. Homework/Lab work	33%

Course Requirements

1. Homework assignments
2. Hands on lab activities
3. Complete comprehensive final

Course Policies

1. There will be *no* horseplay tolerated.
2. No open foot shoes, sandals, or flip-flops: closed foot shoes *only*.
3. No smoking, eating, or sleeping will be tolerated during class.
4. If an assignment is late, there will be 5 points deducted per day.
5. No hanging jewelry or rings in lab.

Disabilities Statement

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)880-1737 or visit the Special Populations Office in the Cecil Beeson Building, Room 120.

Course Schedule

Week	Topic	Reference
1, 2, &3	Differentiate between high and low Voltage circuits	Chapter 15
4	Measure voltage and amp draw of control Circuits	units in lab
5 & 6	Measure and install field wiring	units in lab
7 & 8	Draw and label control circuits handouts	
9 & 10	Prepare for hands on low voltage wiring exam	
11	Complete low voltage wiring as per examples	
12	Low voltage circuits for home appliances	Chapter 11
13	Study of multi- tap step down transformers	lab components
14	Wire and test multi-tap transformers	lab components
15	Prepare for comprehensive final	
16	Administer comprehensive final	

Contact Information

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