

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, 9th edition.
 - a. ISBN number is 10: 1-285-17998-6
2. Modern Refrigeration and Air Conditioning by Althouse, Turnquist, and Bracciano, 19th edition
 - a. ISBN number is 978-1-61960-199-4

Course Objectives

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

1. Read HVAC and Refrigeration control circuits.
2. Troubleshoot control components.
3. Analyze high and low voltage circuits with the use of wiring diagrams.

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
 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

Approved 12/2013

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Course Syllabus

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.

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the *LIT Catalog and Student Handbook* supersedes all other versions of the same document.

Course Schedule

Week	Topic	Reference
1, 2, &3	Differentiate between high and low Voltage circuits	Chapter 15

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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	