

Basic Electricity for HVAC (HART 1401)



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

Prerequisite/Co-requisite: N/A

Course Description

Principles of electricity as required by HVAC, including proper use of test equipment, electrical circuits, and component theory and operation.

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. Demonstrate knowledge of basic principles of electricity, electrical current, circuitry, and air conditioning devices.
2. Apply Ohm's law to electrical calculations.
3. Perform electrical continuity, voltage, and current test with appropriate meters.
4. Demonstrate electrical safety.

Course Outline

- A. Electrical Safety:
 1. Measuring and troubleshooting of energized electrical circuits.
 2. Knowledge of using electrical testing meters & tools, such as DMM.
 3. Proper techniques using safety equipment.
 4. Proper use of lock-outs and tag-outs.
- B. Electrical Principles
 1. Calculating Ohm's Law
 2. Knowledge of electrical theory.
 3. Measuring electrical power, pressure, current & resistance.
 4. Knowledge of electrical symbols.
 5. Analyzing electrical cost efficiency, such as S.E.E.R. & E.E.R.
- C. Series Circuits
 1. Uses for series circuits
 2. Examples of series circuits

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3. Calculation of electrical pressure, pressure drop & current flow through all electrical loads.
- D. Parallel Circuits
 1. Uses for parallel circuits
 2. Examples of parallel circuits
 3. Calculation of electrical pressure, pressure drop & current flow through all electrical loads.
- E. Series – Parallel Circuits
 1. Uses for parallel circuits
 2. Examples of parallel circuits
 3. Calculation of electrical pressure, pressure drop & current flow through all electrical loads.

Grade Scale

- A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = 0-59

Course Evaluation

- | | |
|------------------------|-----|
| 1. 4 Objective Test | 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

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persons with documented disabilities will 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 their office located 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	Electrical safety	Chapter 1
3	Basic electricity	Chapter 2
4	Electric circuits	Chapter 3
5 &6	Electrical symbols	Chapter 5
7 & 8	Reading electric diagrams	Chapter 6
9	A/C Power and D/C Power	Chapter 7
10 &11	Installation of HVAC systems	Chapter 8
12	Basic electric motors	Chapter 9
13	Hands on electric meter evaluation	Chapter 10
14 & 15	General electric meter use, amp meter Volt meter, and ohm meter	
16	General overview and comprehensive final	