

Residential Air Conditioning (HART 1441)



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

Prerequisite/Co-requisite: N/A

Course Description

A study of components, applications, and installation of mechanical air conditioning systems including operating conditions, troubleshooting, repair, and charging of air conditioning systems.

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. Identify systems applications.
2. Implement and perform industry accepted refrigerant charging procedures.
3. Perform air conditioning system installation procedures.
4. Perform component and part diagnostics and replacement.

Course Outline

- A. Safety
 1. Accessing equipment in attics
 2. Safety in confined space
 3. Ladder climbing safety
- B. Applications of residential cooling systems
 1. Sizing of system to condition space
 2. Determining tonnage for maximum system performance
 3. Affect of Energy rated building materials
 4. Affect of housing structure type
- C. Mechanical components and their function
 1. Duct systems
 2. Affect of duct sizing on air flow
 3. Types of duct material
- D. Electrical components and their function
 1. Identify electrical components in residential systems
 2. Troubleshooting techniques for basic electrical components

- E. Installation techniques of residential systems
 - 1. Field install piping techniques
 - 2. Use of performed copper fittings and piping lay out
 - 3. Brazing techniques
 - 4. Proper insulation of field piping
- F. Troubleshooting of residential cooling systems
 - 1. Electrical troubleshooting techniques
 - 2. Gas side troubleshooting techniques
 - 3. Condensate service procedures

Grade Scale

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

Course Evaluation

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|------------------------|-----|
| 1. 4 Objective Test | 34% |
| 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 her 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 Outline

Week	Topic	Reference
1&2	Introduction to basic A/C systems and Principles	Chapter 12
3,4, &5	Study of refrigerants and environmental Requirements	Chapter 9 & 10
6	Preparation for EPA section 608 universal Technician exam	Handouts
7	Administer EPA exam	ESCO Institute study guide
8	Serve and install small hermetic systems	Lab components
9	Leak detection and repair	Use of lab equipment
10& 11	Soldering techniques	Use of lab equipment
12 & 13	Discussion of SEER ratings effective on Entergy consumption and residential energy	Guest lecture
14	Installation of residential Air Conditioning Equipment	lab
15	Review and prepare for comprehensive finals	
16	Comprehensive final	