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, 7th edition.
   a. ISBN number is 13: 9781418042875
2. Modern Refrigeration and Air Conditioning by Althouse, Turnquist, and Bracciano
   a. ISBN number is 1590702808

Course Objectives

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

1. Identify systems applications. (SCANS C5.2, C6.4, C7.3, C9.3, C10.1, C14.5, C20.3, F1.3, F2.6, F4.3, F7.5, F7.5, F9.4, F11.2, F12.3)
2. Implement and perform industry accepted refrigerant charging procedures. (SCANS C5.2, C6.4, C7.3, C9.3, C10.1, C14.5, C20.3, F1.3, F2.6, F4.3, F7.5, F7.5, F9.4, F11.2, F12.3)
3. Perform air conditioning system installation procedures. (SCANS C5.2, C6.4, C7.3, C9.3, C10.1, C14.5, C20.3, F1.3, F2.6, F4.3, F7.5,F7.5, F9.4, F11.2, F12.3)
4. Perform component and part diagnostics and replacement. (SCANS C5.2, C6.4, C7.3, C9.3, C10.1, C14.5, C20.3, F1.3, F2.6, F4.3, F7.5, 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. Accessing equipment in attics
2. Safety in confide 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 Entergy 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

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.

Course Schedule

Week	Topic	Reference
1&2	Introduction to basic A/C systems and Principles	Chapter 9 &
3, 4, & 5	Study of refrigerants and environmental Requirements	10Chapter 12
6	Preparation for EPA section 608 universal Technician exam	Handouts ESCO Institute study guide
7	Administer EPA exam	
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	Guess lecture
14	Installation of residential Air Conditioning Equipment	lab
15	Review and prepare for comprehensive finals	
16	Comprehensive final	

Contact Information

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