

Refrigeration Principles (HART 1407)



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

Prerequisite/Co-requisite: None

Course Description

An introduction to the refrigeration cycle, basic thermodynamics, heat transfer, temperature/pressure relationship, safety, refrigeration containment, and refrigeration components.

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. Identify refrigeration 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)
2. Explain operation of the basic refrigeration cycle and heat transfer. (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. Demonstrate proper application and /or use of tools, test equipment, and safety procedures. (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 Secretary's Commission on Achieving Necessary Skills (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. Safety equipment required for working on pressurized equipment
 2. Proper use of safety equipment

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Course Syllabi

- B. Refrigeration cycle and basic components
 - 1. Basic compression components
 - 2. Basic cycle lay out
- C. Principles of heat transfer
 - 1. Affect of pressure on temperature
 - 2. Study of latent heat
 - 3. Study of sensible heat
- D. Psychometrics and applications
 - 1. Moisture in air
 - 2. Discussion of relative humidity
 - 3. Removal of humidity from condition air
 - 4. Affect from humidity removal on the human body
- E. Air Flow
 - 1. Rating of evaporator blower capacity
 - 2. Affect of duct sizing on air flow
 - 3. CFM requirements per square foot

Grade Scale

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

Course Evaluation

1. Objective 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.

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Course Syllabi

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, Rebecca Cole, at (409)880-1737 or visit her office located in the Cecil Beeson Building, room 120.

Course Schedule

Week	Topic	Reference
1,2, & 3	Study of basic history and fundamental Of refrigeration	Chapter 1 pgs 1-25
4	Study of temperature, pressure measurements	Chapter 1 Pgs 26-50
5	Study of refrigeration tools and materials and Basic refrigeration systems	Chapter 2 & 3
6	Basic refrigeration cycle test	
7	Compression systems and compressors	Chapter 4
8	Test on compression systems, and study of Refrigerant controls	Chapter 5
9	Electric motors	Chapter 7
10	Electric circuits and controls, Test on electric Motors	
11 & 12	Study of electric circuits and controls	Chapter 8
13	Field activities, proper charging techniques	outside lab
14 & 15	Proper superheat and sub cool measurements And preparation for comprehensive final	
16	Comprehensive final	

Contact Information

Instructor:	Mr. Henry Gaus
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Office Hours:	11:00a.m.-12:30p.m.