Industrial Air Conditioning (HART 2443)

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

Prerequisite/Co-requisite: HART 1441 or HART 1407

Course Description

A study of components, accessories, applications, and installation of air conditioning systems above 25 tons capacity.

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, 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. Apply and describe the sequence of operation for industrial systems.
2. Define the sequence of operation for industrial accessories.
3. Demonstrate knowledge of components relative to industrial systems.
4. Troubleshoot systems.

Course Outline

A. Introduction
    1. Introduction of faculty and students
    2. Review Syllabus
    3. Review Class Policies
    4. Review Lab Assignments
B. Review of Basic Heat Transfer
    1. Convection
    2. Conduction
    3. Radiation
C. Chilled Water Systems
    1. Air-to-Air
    2. Air-to-Water
D. Chilled Water Compressors
    1. Reciprocating
    2. Scroll
    3. Rotary Screw
    4. Centrifugal
E. Motors & Pumps
    1. Externally Driven
    2. Direct Drive
    3. DCV Step Motor
    4. ECM Variable Speed Motor
F. Air Distribution System
    1. Air Coils
    2. Duct Heaters
    3. Fire Dampers
G. Energy Management
    1. Zoning
    2. Humidity Control
    3. Secondary Refrigerant Flow Rate
    4. Troubleshooting

5. Managing
6. Cost Analysis

Grade Scale

A = 90 - 100

B = 80 - 89

C = 70 - 79

D = 60 - 69

F = 0 - 59

Course Evaluation

1. 4--Objective Test 25%
2. Lab Projects/test 25%
3. Comprehensive Final 25%
4. Homework 25%

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 disabilities. Among other things, these statutes require that all students 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 office in Student Services, Cecil Beeson Building.

Course Schedule

Week	Topic	Reference
1	Introduction & Safety Orientation	Lecturer Notes & Hand-Outs

Week	Topic	Reference
2	Review of Basic Heat Transfer Theory	Chapter 1 & Lecturer Notes
3	Identify Chilled Water System Types	Chapter 24 & Hand-outs
4	Identify Compressor Types	Chapter 24 , Hand-outs & campus tour
5	Identify Motor & Pump Types	Chapter 24 & Hand-outs
6	Identify Air Coil and Duct Heaters	Chapter 22 & 23 & Hand-outs
7	Identify Energy Management Software	Lecturer Notes & Energy Management Center Tour
8	Identify Chilled Water Systems	Lecturer Notes & Tour Physical Plant
9	Identify Boiler Types	Lecturer Notes & Hand-outs
10	Identify Boiler Systems	Lecturer Notes & Physical Plant Tour
11	Identify Control Systems	Chapter 26 & Hand-outs
12	Identify Duct Designs	Chapter 23, Hand-outs & Lecturer Notes
13	Identify Cost Benefits	Lecturer Notes & Guest Speaker
14	Identify Total System Layout	Tour Physical Plants
15	Review for Final Exam	Lecturer Notes
16	Final Exam	NAIMA Certification

Contact Information:

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