

Austin Community College
Heating, Air Conditioning & Refrigeration Technology
HART2449 HEAT PUMPS

00 SYLLABUS

(08/07/2012)

Course Description a study of heat pumps, heat pump control circuits, defrost controls, auxiliary heat, air flow, and other topics related to heat pump systems.

Course Level intermediate

Prerequisite advanced Electricity (HART 2431)

Supplies Required

- quality multi-meter - digital preferred

- **Textbooks/Materials:** **Textbooks/Materials:** (Modern Refrigeration and Air Conditioning 18th Edition ISBN: 1-59070-280-8

Course packet sold in the HART Department (fifteen dollars)

Learning Outcomes the student will explain a reverse cycle system; list the mechanical and electrical components for the heat operation; and explain the operation of heat pump modes including cooling, heating, defrost, emergency heat, and auxiliary heat mode. The student will identify and explain different methods of accomplishing defrost; check the system charge in the heating and cooling modes with a variety of metering devices; troubleshoot electrical and mechanical components; perform tests for adequate air flow; and determine balance point and CO.P. (Coefficient of performance).

Competencies for Heat Pumps Air Conditioning and Refrigeration Institute (ARI) **Subtopic C**

Title: XII 4. Basic Principles and Components COMPETENCY OBJECTIVES: the student will-
Knowledge:

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- 1 Review the history of heat pumps
 - 2 Explain basic heat pump principles of operation
 - 1 Analyze and explain the refrigerant cycle in both cooling and heating—identifying the pressure and state of the refrigerant at any point in the refrigerant circuit.
 - 1 Explain the basic theory of the air source heat pump system.
 - 2 Explain the basic theory of the water source heat pump system.
 - 3 Explain the basic theory of geothermal source heat pump system.
 - 1 Identify and explain the function of the electrical and mechanical components of the heat pump systems.
 - 1 Explain terms typically used for heat pumps: SEER, COP, HSPF, Balance Points, ODT.
 - 2 Explain the different types of defrost methods.
 - 3 Describe the operation of the time clock in a defrost control.
 - 4 Identify three components of a heat pump system controlled directly during a defrost cycle.
 - 5 Describe a heat pump thermostat function.

Tasks: