

**COURSE PREFIX/NO:** ACR 210  
**COURSE TITLE:** HEAT PUMPS  
**CREDIT HOURS:** 4.0  
**LECTURE HOURS:** 3.0  
**LAB HOURS:** 3.0

**DL ATTENDANCE/VA STATEMENT**  
**TEXTBOOK INFORMATION**

**COURSE DESCRIPTION:**

This course is a study of theory and operational principles of the heat pump.

**COURSE COMPETENCIES:**

Upon successful completion of this course, the student should be competent to install, service, and repair most major brands of manufactured heat pumps.

**MINIMAL STANDARDS:**

Given a set of residential blueprints, the student will work a heat load calculation according to an approved industry standard procedure. (ie. ARI, Manual J, etc.) The student will select the correct size and model heat pump according to manufacturers' specifications per the requirements of his heat load calculation.

Given a malfunction on a heat pump trainer in the shop or on an actual heat pump in the field, the student will troubleshoot the cause of the malfunction and correct the problem according to manufacturers' recommended procedures or accepted industry standards.

Given a heat pump trainer in the shop or an installed heat pump in the field, the student will provide the yearly service maintenance in accordance with manufacturers' recommendations

Given a heat pump trainer in the shop, the student will describe in writing the refrigerant cycle in both heating and cooling modes, the operation of the reversing valve, and the differences between time/temperature, pressure differential or mechanical defrost systems.

Given guidelines of acceptable work behavior by the instructor, the student will exhibit proper work attitudes at all times. See Evaluation Strategies/Grading of this outline for additional details. Given a subject approved by the instructor, the student will research and write a report on the approved subject and present the findings to the class the week following the due date. The instructor will be provided the subject area the student wishes to research no later than **January 24, 2002** for his approval. The paper shall be a minimum of 3 pages, double spaced, 12 font and is due in class **February 21, 2002. Late papers will be penalized 5 points per day until received.**

**COURSE REQUIREMENTS:**

Students are responsible for attaining competencies through completion of the following course requirements:

**ATTENDANCE**

Students will be bound by the policies stated in the York Technical College Student Handbook. "Students must attend 80% of the hours assigned the class for a semester to receive credit for the course." In addition to this requirement, attendance will constitute 15% (150 pts) of the course grade. Every 1 hour of absence will result in the loss of 1.15 points. The instructor may, at his discretion, waive the loss of points for excused absences however all absences both excused and unexcused count towards the 20% maximum.

In the event a student does miss a class, the student is responsible for obtaining the material that was covered during the absence.

If a student is aware that a class will be missed, then the student should notify the instructor at the earliest possible date.

If a student misses a test because of illness or urgent emergency, it is the responsibility of the student to:

Notify the instructor prior to the class period, or at the earliest possible date. At that time a new date for a make up test can be scheduled.

Students with unexcused absences during tests will be allowed to take a make up test at the discretion of the instructor.

The student has the burden to be sure that some arrangement was made with the instructor for taking a make up test.

#### PARTICIPATION IN CLASS DISCUSSIONS

#### COMPLETING ASSIGNED LAB EXPERIMENTS AND TESTS. LABORATORY REQUIREMENTS:

The student will complete all lab assignments issued by the instructor. **ACADEMIC HONESTY:**

"York Technical College adheres to the South Carolina TECH Student Code, approved by the State Board for Technical and Comprehensive Education on March 13, 1974 (revised last April 25, 1984). Copies of this code are available in the Library and from Student Services. ...Any student caught cheating or involved in any other academic dishonesty will be given a grade of zero and will be subject to further disciplinary action."

#### EVALUATION STRATEGIES/GRADING:

The grading scale is as follows:		Points
Grade		
A		900 - 1000
B		800 - 899
C		700 - 799
D		600 - 699
F		0 - 599
Evaluation Method		Total Points
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Tests (minimum of 2)		500
Laboratory		100
Research Paper		200
Attendance		150
Work Attitude		50
1. Participation	25pts	
2. Effort	25pts	1000

#### ENTRY LEVEL SKILLS:

The student must have successfully completed a course on the basic refrigeration cycle and automatic controls. He must have a working knowledge of the basic tools and test instruments used in air conditioning and refrigeration gained from course study or on the job experience.

#### PREREQUISITES: ACR 120

#### CO-REQUISITES: none

**TOPIC/COURSE OUTLINE:** Details to be assigned by instructor.

**LABORATORY EXPERIMENTS:**

Given a set of prints, use requirements, and design conditions, the student will perform a load calculation to determine the equipment necessary to maintain the necessary conditions.

Given a malfunction on a heat pump the student will troubleshoot and correct the problem according to manufacturers' specifications.

**METHODS OF INSTRUCTION:**

This course consists of 2.0 hours of class periods and 6.0 hours of laboratory. The class instruction includes lectures, demonstrations, discussions, and tests. The lectures are given while drawing on the blackboard, using overhead projections, or video tapes.

The lab periods will consist of troubleshooting malfunctions on heat pumps in the shop or on equipment in the field. The students will identify the problem and take corrective action according to manufactures' recommended procedure.

**Research Paper ACR 210**

You will research a subject preapproved by the instructor. If you have not chosen a subject by the preapproval date, the instructor will assign a subject. The paper will be a minimum of 3 pages double-spaced typed. The font will be 12pt. Times New Roman. Upon the completion of the research and paper, you will present to the class your findings. **Late papers will be penalized 5 points per day until received.**

Due Dates:	January 24, 2002	Preapproval Deadline
	February 21, 2002	Paper due
	February 26, 2002	Begin verbal reports