

AUSTIN COMMUNITY COLLEGE
Heating , Air Conditioning & Refrigeration Technology
HART 1445 GAS AND ELECTRIC HEATING

00 Course Syllabus

(01/06/2014)

Name:

Office Hours:

Course Name: Gas and Electric Heating; 4 semester credit hours

Course Description: (Intermediate level course in the Certificate program) A study of the procedures and principles used in servicing heating systems including gas fired and electric furnaces

Textbooks/Materials: **Textbooks/Materials:**(Modern Refrigeration and Air Conditioning 19th Edition ISBN: 978-1-60525-199-4 sold at the Acc bookstore. Course packet sold at the Acc bookstore.

An electrical multimeter is required for testing electrical circuits and components. Since there are many choices and options, your instructor will provide valuable advice before you make this purchase.

SCANS Competencies: general academic and workforce skills necessary for entry-level employment for all American workers are the topic of a 1990 report by the Secretary of Labor's Commission on Achieving Necessary Skills (SCANS). Those skills applicable to Electricity Principles are listed here. The State of Texas Higher Education Coordinating Board requires they be included in our curriculum. They are as follows:

1.0 Resources		5.0 Technology	
1.1 Manages Time	X	5.1 Selects Technology	X
1.2 Manages Money		5.2 Applies Technology to Task	X
1.3 Manages Materials and Facility Resources	X	5.3 Maintains and Troubleshoots Technology	X
1.4 Manages Human Resources		6.0 Basic Skills	
2.0 Interpersonal		6.1 Reading	X

2.1 Participates as a Member of a Team	X	6.2 Writing	X
2.2 Teaches Others	X	6.3 Arithmetic	X
2.3 Serves Clients/Customers		6.4 Mathematics	X
2.4 Exercises Leadership	X	6.5 Listening	X
2.5 Negotiates to Arrive at a Decision	X	6.6 Speaking	X
2.6 Works with Cultural Diversity		7.0 Thinking Skills	
3.0 Information		7.1 Creative Thinking	X
3.1 Acquires and Evaluates Information	X	7.2 Decision Making	X
3.2 Organizes and Maintains Information	X	7.3 Problem Solving	X
3.3 Uses Computers to Process Information		7.4 Mental Visualization	X
4.0 Systems		7.5 Knowing How to Learn	X
4.1 Understands Systems	X	7.6 Reasoning	X
4.2 Monitors and Corrects Performance	X	8.0 Personal Qualities	
4.3 Improves and Designs Systems		8.1 Responsibility	X
		8.2 Self Esteem	X
		8.3 Sociability	X
		8.4 Self-Management	X
		8.5 Integrity/Honesty	X

Additionally, the Heating, Air Conditioning and Refrigeration Technology industry has identified certain professional knowledge and skill competencies. Those competencies that are applicable to Gas and Electric Heating are as follows:

- Professional Service-Character Education
- Safety-Personal Safety and Work Practices
- Electrical Safety
- Tools and Equipment-Electrical Testing Devices/Meters
- Basic Electricity
- Electrical Generation and Distribution

Instructional Methodology: Gas and Electric Heating is a series of lessons that are and textbook based theory learning, and hands-on skills applications. Instructor based multimedia PowerPoint presentation and CD-ROM. This packet contains the course syllabus, a progress record and all the lessons for this course.

Course Rationale: Gas and Electric Heating provides the foundation to support understanding how to troubleshoot gas and electric heating equipment.

Learning Outcomes: The student will identify different types of gas furnaces; identify and discuss component operation of gas furnaces; service and troubleshoot gas furnaces; perform safety inspections on gas and electric furnaces; identify unsafe operation of gas furnaces; identify and discuss component operation of electric furnaces; and service and troubleshoot electric furnaces.

Grading Policy: Grade of A - an average grade of 90% to 100%
Grade of B - an average grade of 80% to 89.9%
Grade of C - an average grade of 70% to 79.9%
Grade of D - an average grade of 60% to 69.9%
Grade of F - an average grade below 60%

To receive a grade of A, B, C or D, the student must complete all tests. Lessons that receive a grade but not completed will be calculated into the course grade average with a grade of zero.

Improving Your Grade: the minimum acceptable grade is 70. Lessons with grades below 70 must be corrected and resubmitted for grading. Your new grade will be calculated by adding the two scores together and dividing by two. The new grade will not exceed 70. The tests may be multiple choice, true or false, or fill-in-the-blank type questions.

Performance of skills may also be required.

- all tests are to be taken during your normal scheduled assigned class times
- all tests are to be administered only by your assigned instructor
- tests are to be turned in at the end of the scheduled class, regardless if it is completed or not
- be sure that you have enough time to complete your tests before starting it

Each test covers the material presented since the previous test. The final exam covers the entire course.

Course Policies:

- the class must be in session when any hands-on work is performed
- students are not to perform hands-on work outside of normal class times
- shop clean up begins at least 10 minutes before end of class. All lab work should stop at that time. A student must clean up spills or mess he creates.
- students must pass (HART1407) welding test before using torches
- students must wear goggles when using grinder, drill, brazing, soldering or working with refrigerant. Safety glasses are an acceptable substitute.

Attendance-you are expected to attend all scheduled meetings. All air conditioning courses meet twice each week, on a Monday-Wednesday schedule or a Tuesday-Thursday schedule. Absences can be made up. Your instructor will work with you in arranging to make up absences. To make up an absence, you must attend a class other than the one you are registered in. You should request permission of the instructor whose class you wish to attend. At the close of the class, present the instructor with a "Class Attendance Form". Have the form filled out so that the instructor need only sign the form. Return the signed form to your official instructor.

Grade of I (Incomplete)-students may receive a grade of "I" if the student has **no** unexcused absences and has completed at least 75% of the required course work. The student must meet with the instructor and request the grade of incomplete.

Grade of W (Withdrawal)-when a student is unable to complete the course and does not qualify for a grade of "I", the student should consider withdrawing from the course. It is the student's responsibility to initiate withdrawal procedures. Do not rely on the instructor to perform this service for you. If a student stops attending, or otherwise fails to complete the course, and does not withdraw, the student may receive a grade of F. Absences: your instructor may initiate withdrawal procedures and assign a grade "W" if you accumulate as many as four unexcused absences.

Excused Absences: verifiable family emergencies, illness or hospitalization constitute excused absences. A prolonged illness or situation which will prevent attendance of many classes may require the student to withdraw rather than receive a grade of "I". These situations should be discussed with your instructor.

HART1445 Gas & Electric Heat - Progress & Evaluation Record (05/15/08)

Name _____ ID _____ Synonym _____ Semester _____

Lesson	Title	Date	Labs	Tests
	Syllabus			
1	Introduction to Gas heat (Video and textbook Ch 10-2)			
2	Central Gas Heaters (Lab)			
3	Tracing Gas Heating & Electric Cooling Circuits (Lab and textbook Ch 8-1)			
4	Gas Burners (Video and textbook Ch 10-1)			
5	SECTION TEST 1 INTRODUCTION TO GAS & ELECTRIC FURNACES			
6	Gas Furnaces (Video)			
7	Testing Thermocouples (Lab)			
8	Controls (Video and textbook Ch 10-4)			
9	Fuses & Breakers (Lab and textbook Ch 7-2)			
10	SECTION TEST 2 GAS FURNACES AND CONTROLS			
11	Electric Heating & Cooling Schematic (Instructor and textbook Ch 8-3)			
12	ST-18 Electric Heat Service Trainer (Lab)			
13	Gas Ignition System (Video)			
14	Hampden Gas Control Trainer (Lab)			
15	SECTION TEST 3 ELECTRIC HEAT & GAS IGNITION SYSTEMS			
16	Safety & Operating Controls (Video and textbook Ch 8-2)			
17	Gas Pressure, BTU'S Per Cu. Ft. & Furnace Pm (Inst & textbook Ch 10-3)			
18	Gas Fired Furnace Controls (Lab)			
19	Honeywell Retrofit Kit Y8610F (Lab)			
20	Hot Surface Ignition (Lab)			
21	Heat Sequencers (Lab)			
22	SECTION TEST 4 - Controls			
23	Janitrol Gas Furnaces (Lab)			
24	Tracing Circuitry (Instruction & Textbook Ch 12-1)			
25	Wiring & Operating Rheem Furnace (Lab)			
26	Lennox Electric Furnace (Lab)			
27	SECTION TEST 5 Gas & Electric Furnaces			
28	Central Heating System (lab)			
29	Wiring an Electric Furnace (Lab)			
30	Motor Pulley (Lab and textbook Ch7-4)			
31	Fusible Link (Instruction)			
32	For future Use			
33	Janitrol Horizontal Furnace (Lab)			
34	FINAL EXAM			
Labs total points =		÷17	x 40% =	
Section tests total =		÷ 5	x 40% =	
Final exam total =			x 20% =	
100-90 = A; 89.9 - 80 = B; 79.9-70 = C; 69.9-60 = D		GPA =		Grade =

Instructor's Signature: _____ Date _____

