**Purpose:** This a one-credit course that introduces students to the fundamental concept of heating systems and heat pumps. Emphasis is placed on identification and operation of different components and

advanced problem-solving techniques. Students learn to troubleshoot problems in gas heat, electrical

heat, and heat pumps. Students enrolled in this course are able to read with comprehension both text

and diagrams. Basic mathematics skills are required for understanding and analyzing airflow

problems. Students use different meters and instruments to obtain information to be used to follow flow charts. Instruction in this course consists of both individual and group classroom and

laboratory activities.

**Goals and Objectives:** Upon completion of this course, students demonstrate skills necessary for

servicing and installing different types of heating systems and their components such as gas piping

and refrigerant piping. Students also demonstrate skills necessary to determine proper airflow and

airflow characteristics. Special emphasis is given to heat pump components and their operation. Prerequisites for course are 3 of the other courses, this course is the advanced class of all courses.

**Textbooks and Other Literature:**

NCCER Level 1

Heating and Cooling Essentials

Electricity & Controls for HVAC/R

**Supplies needed:**

Pencil

Loose leaf paper (College or Wide Rule) - Notebook will be supplied

Overalls (optional)

**Assignments:**

100 points All Class work

100 points Test/Quizzes

100 points Article Research

200 points Tool Test

100 points Shop/Labs

200 points Projects

100 points Shop cleanup

**Training and Testing Credential Policy through NCCER**

**NCCER Testing and Performance Assessment will consist of Module Assessments and the student must:**

Registration/Release Form **MUST** be filled out completely.

Achieve a score of 70 percent or higher on the **closed-book written test** (The score earned on the **first attempt is to be used for LEA grading purposes**.) Students are allowed to retest after a waiting period of 48 hours in order to achieve a 70% or better score for NCCER reporting purposes.

Successfully complete the **module performance assessment** to the satisfaction of the instructor using the industry-based criteria provided by NCCER in making his/her evaluation. This is a ***pass/fail*** test.

Should the student fail the written test, he/she may re-test (take the test over) after a minimum waiting period of 48 hours. Those failing the performance test may re-test immediately or at later time designated by the instructor.

**Special NCCER and ATS Testing Policies**

**The end of module tests cannot be modified or altered in any way.**

Under certain circumstances, the end of module written test may be read, one-on-one, to trainees who have special needs (i.e. trainees in high school programs with IEP documentation) Certified instructor must read test to student being tested.

**No observers are allowed in any testing session.**

Written tests must be administered by a Certified Instructor, ICTP Proctor, or Master Trainer Performance tests must be administered by a Certified Instructor or Performance Evaluator

**For students to earn NCCER credentials, and for the ATEF to retain NCCER accreditation, these policies and procedures must be adhered to without exception.**

**Grading Policy**

1. Class work ; graded for completeness (2 nine week grading periods per semester)

 - full credit = on time and complete

 - half credit = incomplete and late

 - no credit = not turned in

All work will be done in class and turned in at end of day unless instructed otherwise.

Shop work will be graded by amount of time and set points of each action to complete task.

2. Grading Scale:

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

3. Make-up Work:

 Students with Excused absences are responsible for getting class information from another student to find out what was done the day he or she was absent. Any handouts that are needed will be at the front class on the small desk. Make up work will be due the day he or she returns to class or make arrangements with instructor. Any shop or lab work missed will have to be arranged by instructor for that particular work missed.

 **No work may be made up for unexcused absences**.

If student is placed in ISS, that student must notify instructor to arrange class work to be sent to ISS center and must be completed and brought back to class for credit after being released from ISS.

 **No class work returned - No Credit !**

4. Extra credit:

 Extra Credit may be obtained throughout the semester. No extra credit will be assigned if final grades have been calculated.

5. Final Exam:

 A final exam will be given at the end of the semester. It will be worth 20% of the final overall grade for the semester.

**Classroom Rules and Procedures:**

1. Be in your seat when Tardy bell rings. First Tardy will result in a warning.

2. Bring Pencil and paper every day to class.

3. Obtain notebook and begin assignment that is posted on the board.

4. No food or drinks allowed in class.

5. Student must ask for permission to leave class. Permission will be given to go to restroom or water fountain when Instructor is done with class instruction.

6. No one will be in the shop without permission given by the Instructor.

7. Keep your hands off of other’s property. If it is not yours, leave it alone.

8. No profanity, horseplay, disrespect, and lack of cooperation will be allowed. All are grounds for a referral. **This is your first warning!**

9. Do not damage any school property. Tools, desks, tables, or building must be treated with care.

10. No one is allowed in the Instructor’s office without Instructor’s permission.

11. NO PRIVILEGES until fees are paid.

**Format for Heading Papers**

On right hand top margin:

Name Example: George Smith

Assignment Title Hand tools Vocabulary

Block Block 1

Date Sept. 4, 2009

**Final remarks:**

All of the information given is for the student to be able to have an enjoyable semester while also being taught the skills to obtain a passing grade and a means of advancing to the next required class. If any questions are needed to be answered throughout the semester, please feel free to ask. Remember, the effort that is given is what you are graded on. Good attitude = Good semester.

I understand what is expected of me in this class and will do all that is required to have a good semester.

I understand that I will be graded accordingly by the work that is completed and will work hard and respectfully while in the shop.

Student Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_