COURSE INFORMATION FORM

DISCIPLINE HVAC
COURSE TITLE Residential Heating & Cooling II

CATALOG DESCRIPTION
Maintenance, servicing and troubleshooting of high efficiency residential equipment.

PREREQUISITES
HVAC 135

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)
Upon completion of this course, the student will be able to:

1. Demonstrate an understanding of the basic refrigerant cycle as applied to a heat pump.
2. Adjust air flow in mechanical components.
3. Install/replace condensate refrigeration pump unit and sight-glass/moisture indicator.
4. Troubleshoot refrigerant circuit and air circuit.
5. Test compressor efficiency and test for burnout condition.
6. Check condensate pump and drain.
7. Check blower assembly and filter.
8. Test temperatures; check moisture indicator.
9. Install/replace temperature controls.
10. Demonstrate the ability to safely and correctly use torches when brazing.
11. Correctly evacuate a refrigeration system using a vacuum pump, refrigerant gages, and micron gage and to explain the purpose and correct use of each item on a working refrigeration system.
12. Correctly take a superheat and sub-cooling reading on a working refrigeration system.
13. Correctly recover refrigerant using refrigerant gages, refrigerant recovery machine, and recovery bottle.
14. Demonstrate an understanding of the business community.
GENERAL EDUCATION OUTCOMES (ESO)
Specify which general education outcomes, if any, are substantially addressed by the course. Numbers in parentheses identify the Expected Student Outcomes linked to the specific General Education Outcome.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>ESO</th>
</tr>
</thead>
</table>

PROGRAM-LEVEL OUTCOMES

CAREER AND TECHNICAL EDUCATION PROGRAM OUTCOMES
Specify which Career and Technical program outcomes, if any, are substantially addressed by the course by completing the “Career and Technical Education template” to show the relationship between course and program outcomes to assessment measures.

1. Student will demonstrate the ability to apply foundational skills in an industrial setting safely, and to industry guidelines.
2. Student will demonstrate professional oral and written communication skills.
3. Student will think critically and apply problem-solving skills.

CLASS-LEVEL ASSESSMENT MEASURES
Student accomplishment of expected student outcomes may be assessed using the following measures. (Identify which measures are used to assess which outcomes.)

1. Quizzes and written examinations (1-13)
2. Homework and classroom assignments (1-13)
3. Student Participation and in-class discussion (1-14)
4. Lab Assignments (1-13)
Individual instructors may order this outline as fits the needs of their individual courses. In addition, they may place more emphasis on some areas than on others. What is assured is that this particular list is covered in the course. Other topics may be added to a course as the instructor sees fit, and as time and interest allow. An *asterisk can be used to mark an item as optional.

I. Troubleshooting Basic Controls
   A. Mechanical
   B. Electrical

II. Mechanical and Electromechanical Controls
   A. Types of Mechanical controls
   B. Types of Electromechanical controls

III. Electronic and programmable controls

IV. Application of motors

V. Motor starting

VI. Troubleshooting electric motors

VII. Troubleshooting
   A. Mechanical
   B. Electrical
   C. Air-Side
   D. Services
   E. Refrigerant Circuit

VIII. Electric heat
   A. All-weather split systems
   B. Packaged units

IX. Heat pumps
   A. Types of heat pumps
   B. Air to air heat pumps

X. Residential Package Units

XI. Business Principles