COURSE INFORMATION FORM

DISCIPLINE HVAC

COURSE TITLE Fundamentals of Refrigeration

CR.HR 4  LECT HR. 2  LAB HR. 4  CLIN/INTERN HR.  CLOCK HR. 

CATALOG DESCRIPTION

Basic principles of refrigeration and their application in HVAC/R. Development of basic skills required for installation, maintenance and servicing HVAC/R equipment. This course prepares students for the EPA 608 refrigeration certification test.

PREREQUISITES

None

EXPECTED STUDENT OUTCOMES IN THE COURSE (ESO)

Upon completion of this course, the student will be able to:
1. Identify the four main components of the refrigerant system.

2. Demonstrate the ability to differentiate between the three ‘states’ or conditions of refrigerant.

3. Perform superheat and sub-cooling calculations.

4. Analyze basic refrigerant system readings.

5. Recognize important temperature points on the Fahrenheit, Celsius, Rankin, and kelvin temperature scales and correctly perform conversion calculations between the various temperature scales.

6. Summarize heat transfer principles.

7. Explain the use of various manufacture and industry charging aids.

8. Accurately utilize a P/H diagram to plot the refrigeration cycle and calculate correctly the THOR, HOC, and NRE.

9. List and summarize the three basic refrigerant charging methods.

10. List the three main leak detection methods.

11. Summarize the two main methods of system evacuation.

12. Distinguish the operational characteristics and benefits of fixed metering devices and Thermostatic expansion valves.

13. Correctly use tubing benders, flaring and swaging kits.

14. Demonstrate the ability to safely and correctly use torches when brazing.

15. Demonstrate the ability to perform a standing pressure test.

16. Correctly evacuate a refrigeration system.

17. Correctly take a superheat and sub-cooling reading.

18. Correctly recover refrigerant.

19. 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.

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<th>Outcomes</th>
<th>ESO</th>
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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.
4. The program will graduate individuals who exhibit competence in the entry-level skills of technical profession heating, ventilation and air conditioning technology.

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 Exams (1-18)
2. Homework and classroom exercises (1-18)
3. Student participation in class discussions (1-19)
4. Lab assignments (1-18)
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. Theory of Heat
   A. Matter and Energy
   B. Refrigeration and Refrigerants

II. Safety, Tools and Equipment Shop Practices
    A. General Safety
    B. Tools and Equipment
    C. Tubing and Piping
    D. System Charging

III. Introduction to Automatic Controls

IV. Basic Components
    A. Evaporators and the refrigeration system
    B. Condensers
    C. Expansion Devices
    D. Compressors