

## COURSE SYLLABUS

<b>LAST REVIEW</b>	Fall 2022
<b>COURSE TITLE</b>	Cooling II
<b>COURSE NUMBER</b>	HVAC 0227
<b>DIVISION</b>	Career and Technical Education
<b>DEPARTMENT</b>	HVAC
<b>CIP CODE</b>	47.0201
<b>CREDIT HOURS</b>	3
<b>CONTACT HOURS/WEEK</b>	Class: 1                      Lab: 4
<b>PREREQUISITES</b>	HVAC 0100

### COURSE DESCRIPTION

This course will cover the fundamentals of residential cooling. This will include installation, controls, typical operating conditions, and troubleshooting. Different types of systems will be discussed and evaluated.

### PROGRAM ALIGNMENT

This course is part of a program aligned through the Kansas Board of Regents and Technical Education Authority. For more information, please visit:

[https://kansasregents.org/workforce\\_development/program-alignment](https://kansasregents.org/workforce_development/program-alignment)

### PROGRAM LEARNING OUTCOMES

1. The student will be able to demonstrate the ability to perform HVAC procedures in a safe manner
2. The student will be able to classify the different needs of equipment and summarize a solution.
3. The student will be able to exhibit a high level of professionalism including appropriate dress, attendance, communication skills and other soft skills necessary.

### TEXTBOOKS

<http://kckccbookstore.com/>

### METHODS OF INSTRUCTION

A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, panels, conferencing, performances, and learning experiences outside the classroom.

Methodology will be selected to best meet student needs.

## **COURSE OUTLINE**

- I. Refrigeration Applied to Air Conditioning
  - A. The Function of the Evaporator
  - B. Evaporator Application
  - C. The Compressor
  - D. The Reciprocating Compressor
  - E. The Rotary Compressor
    - 1. Stationary Vane Rotary Compressor
    - 2. Rotary Vane Rotary Compressor
  - F. The Scroll Compressor
  - G. The Condenser
  - H. Expansion Devices

## **COURSE LEARNING OUTCOMES AND COMPETENCIES**

Upon successful completion of this course, the student will:

- A. Demonstrate an understanding of air conditioning evaporator.
  - 1. Describe the evaporator as a tubular refrigeration coil with aluminum fins for heat exchange.
  - 2. Describe and identify an A coil.
  - 3. Describe and identify a slant type coil.
  - 4. Describe and identify a W type coil.
  - 5. Describe heat removal by-products as condensation.
- B. Demonstrate an understanding of the five types of air conditioning compressors.
  - 6. Describe a Reciprocating Compressor – (Residential)
  - 7. Describe a Rotary Compressor – (Commercial)
  - 8. Describe a Scroll Compressor – (Residential)
  - 9. Describe a Centrifugal Compressor – (Commercial)
  - 10. Describe a Screw Compressor – (Commercial)
  - 11. Demonstrate that compressors all compress vaporized refrigerant and pump it throughout the system.
- C. Demonstrate an understanding of an air conditioning condenser.
  - 12. Demonstrate how the condenser functions in heat rejection from the system, resulting in condensation.
  - 13. Describe the use of the concept of “place of no concern” in air conditioning technology.
  - 14. Describe the use of vapor refrigerant as a heat absorbent by state-of refrigerant change.
  - 15. Describe how air flow evacuates heat from the system.
  - 16. Describe and demonstrate temperature probe determination of temperature drop at the evaporator.

- D. Demonstrate an understanding of air conditioning metering devices.
17. Describe how the expansion device meters the refrigerant to the evaporator.
  18. Describe the thermostatic expansion valve and the fixed bore metering device.
  19. Demonstrate understanding of the safe, proper attachment of metering devices to a pressure-based system.
  20. Demonstrate proper attachment sequence of metering devices to a system while pressurized.
  21. Read and describe the events resulting in pressure differentials on the metering lines.
  22. Demonstrate proper charging, bleeding, and refrigerant recovery (according to EPA standards).
- E. describe the package air conditioning equipment.
23. Describe, identify, and explain function of the condenser component of various packaged air conditioning products.
  24. Describe, identify, and explain function of the evaporator component of various packaged air conditioning products.
  25. Describe, identify, and explain function of the compressor component of various packaged air conditioning products.

### **ASSESSMENT OF COURSE LEARNING OUTCOMES AND COMPETENCIES**

Student progress is evaluated through both formative and summative assessment methods. Specific details may be found in the instructor's course information document.

### **COLLEGE POLICIES AND PROCEDURES**

*Student Handbook*

<https://www.kckcc.edu/files/docs/student-resources/student-handbook-and-code-of-conduct.pdf>

*College Catalog*

<https://www.kckcc.edu/academics/catalog/index.html>

*College Policies and Statements*

<https://www.kckcc.edu/about/policies-statements/index.html>

*Accessibility and Accommodations*

<https://www.kckcc.edu/academics/resources/student-accessibility-support-services/index.html>.