

COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Electrical Fundamentals
COURSE NUMBER	HVAC 0125
DIVISION	Career and Technical Education
DEPARTMENT	HVAC
CIP CODE	47.0201
CREDIT HOURS	4
CONTACT HOURS/WEEK	Class: 1.5 Lab: 5
PREREQUISITES	None

COURSE DESCRIPTION

This course will introduce students to wiring system diagrams and proper and safe wiring techniques. It is important to understand system diagrams when diagnosing and repairing heating and cooling problems. This course will also cover wire types, wiring all weather systems, special tools and all wiring system diagrams.

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

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. Wiring Diagram
 - A. Drawing of Electrical Circuits
 - B. Pictorial Wiring Diagrams
 - C. Ladder Schematic
 - D. Legends
 - E. Symbols
- II. Four steps in building an Diagram
- III. Schematic Symbols
- IV. Safety Precautions
- V. Ohm's Law

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Describe the terms associated with wiring diagrams.
 1. State and demonstrate the safety precautions that must be followed when working on electrical equipment and circuits.
 2. Describe how AC and DC electricity are different
 3. Describe how to review math principles pertaining to basic algebraic equations.
 4. Read and interpret common electrical symbols.
 5. Describe how to read and interpret electrical diagrams.
- B. Demonstrate the four steps in building a diagram.
 6. Demonstrate how a pictorial diagram shows the location of a component in the system.
 7. Describe the operation of a load by following the flow of power through a schematic diagram.
 8. Demonstrate how the transformer divides the line voltage from control voltage.
 9. Demonstrate how to use the ladder schematic to find the correct operation of an electrical circuit.
- C. Demonstrate an understanding of schematic symbols.
 10. Demonstrate how to construct parallel circuits.
 11. Demonstrate how to construct series circuits.
 12. Demonstrate how to construct combination parallel and series circuits.
 13. Demonstrate how line voltage and low voltage circuits are shown together.
 14. Draw and demonstrate a pictorial diagram.

15. Draw and demonstrate a ladder schematic.
 16. Identify electrical loads.
- D. Demonstrate safety precautions.
17. State and demonstrate the safety precautions that must be followed when working on electrical equipment and circuits.
 18. Demonstrate how electrical power is distributed.
 19. Identify control switches for each circuit.
 20. Describe the purpose and operation of the various electrical components used in HVAC equipment.
 21. Perform voltage, current, and resistance measurements using electrical test equipment.
 22. Identify low voltage from high voltage.
 23. Demonstrate how to follow the flow of electrical current.
- E. Describe Ohm's Law.
24. Apply Ohm's law to calculate the current, voltage, and resistance in a circuit.
 25. Apply the power formula to calculate how much power is consumed by a circuit.
 26. Describe how voltage, current, resistance, and power are related.
 27. Describe the difference between series and parallel circuits and calculate loads in each.
 28. Describe the formulas for finding voltage, resistance, current.

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>.

