COURSE SYLLABUS

LAST REVIEW	Fall 2022
COURSE TITLE	Electrical Theory 1
COURSE NUMBER	HVAC 0105
DIVISION	Career and Technical Education
DEPARTMENT	HVAC
CIP CODE	47.0201
CREDIT HOURS	2
CONTACT HOURS/WEEK	Class: 0.5 Lab: 3
PREREQUISITES	HVAC 0100

COURSE DESCRIPTION

This course will introduce students to basic electricity and electrical components. The course will start with the movement of electrons, conductors, insulators, direct and alternating current and electrical units of measurement.

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. Basic Electricity and Magnetism
   - A Structure of Matter
   - B. Movement of Electrons
   - C. Conductors
   - D. Insulators
   - E. Electricity Produced from Magnetism
   - F. Direct Current
   - G. Alternating Current
   - H. Electrical Units of Measurement
   - I. The Electrical Circuit

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

A. Describe the structure of an atom.
   1. Explain Protons
   2. Explain Electrons
   3. Explain Neutrons

B. Demonstrate an understanding of what makes a good conductor.
   4. Explain copper as a conductor.
   5. Explain silver as a conductor.

C. Demonstrate and understanding of how magnetism works.
   6. Demonstrate A coil with and electric current flowing through the loops of wire will cause an iron bar to be attracted into it. Switching devices designed to use this action are solenoids, relays, and contractors.

D. Understand the difference between alternating current and direct current.
   7. Demonstrate an electrical current produced to flow in one direction is called direct current (DC).
   8. Demonstrate an electrical current that continually reverses itself is called alternating current (AC).

E. List the six units of measurement for electricity.
   9. Explain voltage.
   10. Explain an ampere.
   11. Explain an ohm.
   12. Explain capacitance.
   13. Explain microfarad.

14. Explain impedance.

F. Understand the difference between series and parallel circuits
15. Demonstrate the voltage is divided across the different resistances.
16. Demonstrate the total current flows through each resistance or load.
17. Demonstrate the resistances are added together to obtain the total resistance. The formula for calculating total resistance in a series circuit is as follows:
18. Explain R total = R1 + R2 + R3
19. Demonstrate the total voltage is applied across each resistance.
20. Demonstrate the current is divided between the different loads according to their individual resistances, and the total current is equal to the sum of the currents in each branch.
21. Demonstrate the total resistance is less than the value of the smallest resistance.

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.