

COURSE SYLLABUS

LAST REVIEW	Spring 2021
COURSE TITLE	Electronic Circuit Fundamentals
COURSE NUMBER	AUDI 0108
DIVISION	Arts, Communications, and Humanities
DEPARTMENT	AUDI
CIP CODE	10.0203
CREDIT HOURS	3.00
CONTACT HOURS/WEEK	Class: 3.00 Lab: X Clinical: X
PREREQUISITES	Simple understanding of mathematics
COURSE PLACEMENT	Students must meet the correct placement measure for this course. Information may be found at: https://www.kckcc.edu/admissions/information/mandatory-evaluation-placement.html

COURSE DESCRIPTION

This beginning course in electronics gives an understanding of voltage, current, resistance, and power in electronic circuits. It covers the fundamentals of Ohm's Law, Joule's Law, and Kirchhoff's Laws. Additionally, an introductory survey of simple transistor circuits and digital circuits will offer students a preview of more advanced material in electronics. Students will learn to read and draw schematic diagrams of electronic circuits, and will learn how to construct circuits based on those schematics. Students will learn to operate standard electronics test equipment to make quantitative measurements of and will become familiar with electronic components. All topics will have an associated laboratory experiment to demonstrate real electronics operation in conjunction with theory.

KANSAS SYSTEMWIDE TRANSFER: AUDIO108

The learning outcomes and competencies detailed in this course outline or syllabus meet or exceed the learning outcomes and competencies specified by the Kansas Core Outcomes Groups project for this course as approved by the Kansas Board of Regents.

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

General Education Learning Outcome

- Basic Skills for Communication
- Mathematics
- Humanities
- Natural and Physical Sciences
- Social and Behavioral Sciences

Institutional Learning Outcomes

- Communication
- Computation and Financial Literacy
- Critical Reasoning
- Technology and Information Literacy
- Community and Civic Responsibility
- Personal and Interpersonal Skills

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. The Nature of Electricity
 - A. Electrification by Friction
 - B. Planetary Atom
 - C. Electric Current and Potential Difference
 - D. Source of Electricity
 - E. Electric Lamp
 - F. Circuit Diagrams
 - G. Electric Shock
- II. The International System of Units (SI Units)

- A. Fundamental Units
- B. Scientific Notation, Metric Prefixes, and Significant
- C. Figures
- D. Unit of Force
- E. Work, Energy, and Power
- F. Temperature and Heat
- III. The Electrical Units
 - A. Units of Current and Charge
 - B. Current Direction
 - C. EMF, Potential Difference, and Voltage
 - D. Resistance and Conductance
 - E. Ohm's Law
 - F. Electrical Power and Energy Page 3
- IV. Conductors, Insulators, and Resistors
 - A. Atomic Bonding
 - B. Insulators
 - C. Conductors
 - D. Conductor Resistivity
 - E. Temperature Effects on Conductors
 - F. Resistor Construction
 - G. Color Code
 - H. Resistor Power Ratings
 - I. Temperature Coefficient of Resistors
 - J. Linear and Nonlinear Resistors
- V. Voltage Cells and Batteries
 - A. Simple Voltage Cell
 - B. Cell Equivalent Circuit
 - C. Dry Cells
 - D. Voltage Cells in Parallel
 - E. Lead-Acid Battery
- VI. Series Resistive Circuits
 - A. Current in a Series Circuit
 - B. Voltage Drops in a Series Circuit
 - C. Voltage Divider
 - D. Potentiometer
 - E. Power in a Series Circuit
 - F. Voltage Dropping and Current Limiting
 - G. Open Circuits and Short Circuits in a Series Circuit
- VII. Parallel Resistive Circuits
 - A. Voltage and Current in a Parallel Circuit
 - B. Parallel Equivalent Circuit
 - C. Conductances in Parallel
 - D. Current Divider
 - E. Power in Parallel Circuits

- F. Open Circuits and Short Circuits in a Parallel Circuit
- VIII. Series-Parallel Circuits
 - A. Equivalent circuits of a Series-Parallel Circuits
 - B. Currents in a Series-Parallel Circuit
 - C. Voltage Drops in a Series-Parallel Circuit
 - D. Open-Circuits and Short-Circuits in
 - E. Series-Parallel Circuits
 - F. Analysis of Series-Parallel Circuits
- IX. Laboratory Experiments
 - A. Introduction to Equipment and Components
 - B. How to Use Basic Lab Equipment
 - C. Ohm's Law
 - D. Series Circuits
 - E. Series-Aiding and Series-Opposing Voltages
 - F. Parallel Circuits
 - G. Series-Parallel Circuits
 - H. Kirchhoff's Laws
 - I. Voltage Dividers With Loads
 - J. Current Dividers
 - K. Voltage Divider Design
 - L. Ammeters
 - M. Voltmeters
 - N. Ohmmeters
 - O. Construct Electronic Circuits

COURSE LEARNING OUTCOMES AND COMPETENCIES

Upon successful completion of this course, the student will:

- A. Upon completion of the course the student will be able to identify standard electronic test equipment.
- B. Upon completion of the course the student will be able to operate standard electronic test equipment.
- C. Upon completion of the course the student will be able to identify common electronic components.
- D. Upon completion of the course the student will be able to apply ohm's law to electronic circuits.

COURSE COMPETENCIES:

Upon completion of the course:

The student will be able to identify standard electronic test equipment.

1. Upon completion of the course the student will be able to identify Voltmeters.
2. Upon completion of the course the student will be able to identify Ohmmeters.

3. Upon completion of the course the student will be able to identify Ampermeters.
4. Upon completion of the course the student will be able to identify common electronic components.

The student will be able to operate standard electronic test equipment.

5. Upon completion of the course the student will be able to operate Voltmeters.
6. Upon completion of the course the student will be able to operate Ohmmeters.
7. Upon completion of the course the student will be able to operate Ampermeters.
8. Upon completion of the course the student will be able to solve basic electronic circuits involving voltage, current, resistance and power.

The student will be able to identify common electronic components.

9. Upon completion of the course the student will be able to identify series circuits.
10. Upon completion of the course the student will be able to draw schematic diagrams,
11. Upon completion of the course the student will be able to recognize electronic components.
12. Upon completion of the course the student will be able to read resistances by using color codes.
13. Upon completion of the course the student will be able to identify series- aiding and series-opposing voltages.
14. Upon completion of the course the student will be able to identify parallel circuits.

The student will be able to apply Ohm's Law to electronic circuits.

15. Upon completion of the course the student will be able to solve series-parallel circuits (complex circuits).
16. Upon completion of the course the student will be able to solve complex circuits using Kirchoff's Law.
17. Upon completion of the course the student will be able to identify voltage divider circuits.
18. Upon completion of the course the student will be able to solve voltage divider circuits.
19. Upon completion of the course the student will be able to design voltage divider circuits.
20. Upon completion of the course the student will be able to use basic hand tools; such as, soldering iron, pliers, wire cutters (diagonal cutters), etc.
21. Upon completion of the course the student will be able to connect and choose the appropriate test equipment.
22. Upon completion of the course the student will be able to construct electronic circuits from a schematic drawing.

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>.