

SYLLABUS

DATE OF LAST REVIEW:	09/2019
CIP CODE:	11.0801
SEMESTER:	Departmental Syllabus
COURSE TITLE:	Electronic Circuit Fundamentals
COURSE NUMBER:	ENGR-0108
CREDIT HOURS:	3
INSTRUCTOR:	Departmental Syllabus
OFFICE LOCATION:	Departmental Syllabus
OFFICE HOURS:	Departmental Syllabus
TELEPHONE:	913-334-1100
EMAIL:	<i>KCKCC issued email accounts are the official means for electronically communicating with our students.</i>
PREREQUISITE(S):	Simple understanding of mathematics

REQUIRED TEXT AND MATERIALS: Please check with the KCKCC bookstore, <http://www.kckccbookstore.com/>, for the required texts for your particular class.

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 advance 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.

METHOD 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, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:

- I. Unit 1. 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. Unit 2. 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. Unit 3. 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. Unit 4. 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. Unit 5. 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. Unit 6. 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. Unit 7. Parallel Resistive Circuits
- A. Voltage and Current in a Parallel Circuit
Parallel Equivalent Circuit
 - B. Conductances in Parallel
 - C. Current Divider
 - D. Power in Parallel Circuits
 - E. Open Circuits and Short Circuits in a Parallel Circuit

- VIII. Unit 8. 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 Series-Parallel Circuits
 - E. Series-Parallel Circuits
 - F. Analysis of Series-Parallel Circuits

Laboratory Work

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

EXPECTED LEARNER OUTCOMES:

- 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 identify common electronic components.
- C. Upon completion of the course the student will be able to operate standard electronic test equipment.
- 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.

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

- 4. Upon completion of the course the student will be able to identify common electronic components.
- 5. Upon completion of the course the student will be able to recognize electronic components.
- 6. Upon completion of the course the student will be able to read resistances by using color codes.

Upon completion of the course the student will be able to operate standard electronic test equipment.

- 7. Upon completion of the course the student will be able to operate Voltmeters.
- 8. Upon completion of the course the student will be able to operate Ohmmeters.
- 9. Upon completion of the course the student will be able to operate Ampermeters.
- 10. 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.
- 11. Upon completion of the course the student will be able to connect and choose the appropriate test equipment.

12. Upon completion of the course the student will be able to construct electronic circuits from a schematic drawing.
Upon completion of the course the student will be able to apply Ohm's Law to electronic circuits.
13. Upon completion of the course the student will be able to solve basic electronic circuits involving voltage, current, resistance and power.
14. Upon completion of the course the student will be able to identify series circuits.
15. Upon completion of the course the student will be able to draw schematic diagrams,
16. Upon completion of the course the student will be able to identify series- aiding and series-opposing voltages.
17. Upon completion of the course the student will be able to identify parallel circuits.
18. Upon completion of the course the student will be able to solve series-parallel circuits (complex circuits).

19. Upon completion of the course the student will be able to solve complex circuits using Kirchoff's Law.
20. Upon completion of the course the student will be able to identify voltage divider circuits.
21. Upon completion of the course the student will be able to solve voltage divider circuits.
22. Upon completion of the course the student will be able to design voltage divider circuits.

ASSESSMENT OF LEARNER OUTCOMES:

Assessment methods may include, but are not limited to, the following: Homework, Assignments, Quizzes, Class Participation, Chapter Tests, and Final Exam. The grading scale and the process for calculating the course grades are to be determined by the individual instructors. This information will be included in each instructor's syllabus.

SPECIAL NOTES:

This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student's progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

Kansas City Kansas Community College offers equal educational opportunity to all students as well as serving as an equal opportunity employer for all personnel. Various laws, including Title IX of the Educational Amendments of 1972, require the college's policy on non-discrimination be administered without regard to race, color, age, sex, religion, national origin, physical handicap, or veteran status and that such policy be made known.

Kansas City Kansas Community College complies with the Americans with Disabilities Act. If you need accommodations due to a documented disability, please contact the disabilities services office at (913) 288 - 7664.

All enrolled students at Kansas City Kansas Community College are subject to follow all rules, conditions, policies and procedures as described in both the Student Code of Conduct as well as the Student Handbook. All Students are expected to review both of these documents and to understand their responsibilities with regard to academic conduct and policies. The Student Code of Conduct and the Student Handbook can be found on the KCKCC website.

