DATE OF LAST REVIEW: 2/15/2013
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: KCKCC issued email accounts are the official means for electronically communicating with our students.
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 technology is to give a clear concept of direct current, the relationship between voltage, current and resistance. Also to familiarize with laboratory instruments, circuit components and basic measuring techniques. In order to build a solid foundation for the entire program, an individual must have a clear concept of D.C. electricity. The student must recognize basic electronic components, instruments and circuit symbols. The student should be able to draw a schematic diagram of a circuit. Last but not least, the student should know how to use the instruments and make quantitative measurements of electronic units. This introductory course is designed to lead students to understand and retain in their minds the basic circuit fundamentals of electronics.

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 Figures
C. Unit of Force
D. Work, Energy, and Power
E. 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

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
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
   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 Ampmeters.

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 Ampmeters.
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.

13. Upon completion of the course the student will be able to apply Ohm’s Law to electronic circuits.

14. Upon completion of the course the student will be able to solve basic electronic circuits involving voltage, current, resistance and power.

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 Director of the Academic Resource Center at 913-288-7670.