COURSE TITLE: AC/DC Circuits I
COURSE NUMBER: ELET0130
CREDIT HOURS: 4
INSTRUCTOR: Departmental Syllabus
OFFICE LOCATION: Departmental Syllabus
OFFICE HOURS: Departmental Syllabus
EMAIL: Departmental Syllabus
KCKCC-issued email accounts are the official means for electronically communicating with our students.
PREREQUISITE (S): None

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

COURSE DESCRIPTION:
The purpose of the course is to provide the student an introduction to the basic principles of electricity including sources of alternating (A.C.) and direct (D.C.) and voltage. The student will learn Ohm’s and Kirchhoff’s Laws by working test and pictorial problems. They then will apply the knowledge in the laboratory. Software will also be utilized alongside learning the theories, and to back up the lab work. This is a foundation course of basic knowledge, skills, and aptitude preparing the student for more advanced electronics courses.
**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, panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

**COURSE OUTLINE**

I. Demonstrate and Understanding of:
   1. Sources of A.C. and D.C. Electricity
   2. Principles of generators and batteries
   3. Principles of series, parallel, and series-parallel circuits
   4. Principles of reasoning of bridges and voltage-divider networks

II. Use of a Scientific/Engineering calculator to analyze currents and voltage through a (A.C./D.C. Circuit)

III. Ohm's Law solving for A.C./D.C. voltage, current and resistance

IV. Know the Basic Electrical Symbols

V. Know the resistor color codes

VI. Multi-meter measurement of A.C./D.C. voltage, current, ohms and frequency

VII. A.C. vs. D.C. voltage and current

VIII. Induction and RL Circuits

IX. Learn the make-up and use of generators and batteries

X. Basic semiconductor theory.

XI. Recognize and draw series, parallel, and series-parallel circuits

XII. Learn the practical application of full-wave and half-wave bridge rectifiers

XIII. Cover the use of PC software where A.C./D.C. circuit input can be analyzed

XIV. Learn the use of analog and digital Voltmeters

XV. Learn the use and reading of Megohm meters.

**EXPECTED LEARNER OUTCOMES:**

A. The student will be able to describe and apply Ohms, Watts, and Kirchoff laws.

B. The student will be able to define, demonstrate and apply the characteristics of series, parallel, and combination circuits.

C. The student will be able to explain DC theory concepts.

D. The student will be able to explain AC theory concepts.

E. The student will be able to perform and interpret electrical measurements using industry standard equipment.

F. The student will be able to explain the use analog and digital voltimeters.

G. The student will be able to analyze series and parallel resonate circuits and evaluate the effects of capacitive/inductive reactance and impedance.

H. The student will be able to explain the components of generators and battery elements.
I. The student will be able to understand the use of a scientific calculator to analyze currents and voltage through an A.C./D.C. Circuit.

J. The student will be able to read and understand electric and electronic schematics.

CORE COMPETENCIES:

The student will be able to describe and apply Ohms, Watts, and Kirchoff laws.

1. The student will be able to plot current flow from source to work load.
2. The student will be able to measure current in a circuit.
3. The student will be able to measure resistance in a circuit.
4. The student will be able to measure power in a circuit.
5. The student will be able to measure voltage in a circuit.
6. The student will be able to wire a series circuit.
7. The student will be able to wire a parallel circuit.

The student will be able to define, demonstrate and apply the characteristics of series, parallel, and combination circuits.

8. The student will be able to solve for resistance in series circuits.
9. The student will be able to solve for voltage in series circuits.
10. The student will be able to solve for amperage in series circuits.
11. The student will be able to solve amperage in parallel circuits.
12. The student will be able to solve voltage in a parallel circuit.
13. The student will be able to determine resistance in a parallel circuit.
14. The student will be able to determine resistance in a series-parallel circuit.

The student will be able to identify characteristics of a series circuit.

15. The student will be able to identify characteristics of a parallel circuit.
16. The student will be able to identify characteristics of a series-parallel circuit.

The student will be able to explain DC theory concepts.

17. The student will be able to describe the make-up of batteries.
18. The student will be able to demonstrate how batteries use chemicals to produce direct current power.
19. The students will be able to explain why D.C. energy speed can be controlled.
20. The student will be able to display a sine wave of D.C. electricity
21. The student will be able to determine which type of battery life is more durable.

The student will be able to draw a full-wave bridge rectifier.

22. The student will be able to draw a half-wave rectifier.
23. The student will be able to demonstrate the flow of electricity in a bridge rectifier.

The student will be able to define the characteristics of different battery types.

The student will be able to explain A.C. theory concepts.

24. The student will be able to use a metering device to explain A.C./D.C. electricity.
25. The student will be able to explain A.C./D.C. components.
26. The student will be able to explain characteristics of different A.C./D.C. sources.
The student will be able to perform and interpret electrical measurements using industry standard equipment.

27. The student will be able to measure current with an ammeter.
28. The student will be able to measure voltage with voltmeter.
29. The student will be able to measure resistance with ohmmeter.

The student will be able to explain the use of analog and digital voltmeters.

30. The student will be able to demonstrate procedure for using an analog voltmeter.
31. The student will be able to demonstrate procedure for using digital voltmeter.

The student will be able to analyze series and parallel resonate circuits and evaluate the effects of capacitive/inductive reactance and impedance.

32. The student will be able to explain resonance.
33. The student will be able to show a graph of capacitive/inductive reactance.
34. The student will be able to use a formula to determine impedance.

The student will be able to explain the components of generators and battery elements.

35. The student will be able to describe the make-up of generators.
36. The student will be able to demonstrate how generators produce alternating current.
37. The student will be able to explain the different types of generators.
38. The student will be able to explain the different characteristics in generators.

The student will be able to understand the use of a scientific calculator to analyze currents and voltage through a simple A.C./D.C. Circuit.

39. The student will be able to demonstrate Ohm’s law using a calculator for A.C./D.C. circuits.

The student will be able to read and understand electric and electronic schematics.

40. The student will be able to read and understand electronic schematics.
41. The student will be able to explain different components of an electronic schematic.
42. The student will be able to explain the function of an electronic component.
43. The student will be able to determine the operation of the circuit.

ASSESSMENT OF LEARNER OUTCOMES:
Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.

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, in Rm. 3354 or call at: 288-7670.