JEFFERSON COLLEGE

COURSE SYLLABUS

EGR261

CIRCUIT ANALYSIS I

3 Credit Hours

Prepared by: Mr. Cliff Castle

Revised by: Dr. Bob Brazzle
April, 2016

Minor Revision or Update by: Fran Moore
Per Curriculum Committee Process Change: April 25, 2018

Dr. Rob Brieler, Division Chair, Math & Science
Dr. Shirley Davenport, Dean, Arts & Science Education

EGR261 Circuit Analysis I

I.   CATALOG DESCRIPTION

      A.   Course prerequisite: Reading proficiency
                Course co-requisites:
- PHY224 General Physics II
- MTH205 Differential Equations

      B.   3 semester hours credit

      C.   Circuit Analysis I is a beginning course in the mathematical modeling of electrical circuits. Emphasis is placed on circuit elements, Kirchoff's Laws, mesh and nodal analyses, and the response of resistors, inductors, and capacitors to various signals. (S)

      D.   Curricular alignment: Elective course applies toward AA or AS – Engineering emphasis degree.

II.   EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Expected Learning Outcomes	Assessment Measures
Visualize and redraw an electrical circuit into a simpler equivalent	Classroom discussions, homework, exams
Identify and use a minimal set of equations and procedural tools for analysis of circuits	Classroom discussions, homework, exams
Recognize the difference between an actual and ideal power source	Classroom discussions, homework, exams
Apply concepts and procedures from MTH205 to analyze electrical circuits	Classroom discussions, homework, exams
Acquire the background needed to thrive in future electrical engineering courses	Students will take the Missouri U. of S&T's Final

III.   OUTLINE OF TOPICS

      A.   Introduction to terminology - students will learn the terminology circuit element, voltage, current, power, node, and loop

      B.   Loop and nodal analysis
            1.   Ohm's Law will be understood as the basic relationship between voltage and current
            2.   Kirchoff's Laws will be defined as the bases of circuit analysis.
            3.   Students will discriminate between single-loop and single node-pair circuits
            4.   Compare and contrast mesh and nodal analysis
            5.   Thevenin's and Norton's Theorems will be seen as a simplifying method for complex circuits

C. Inductors and capacitors
    1. LC circuits will be explained
    2. RC circuits will be compared and contrasted with LC circuits
    3. RL circuits will be compared and contrasted with LC and RC circuits
    4. RLC circuits illustrate the most general type of electrical circuit

D. Signals
    1. Natural and forced responses will be introduced
    2. Source-free parallel circuits will be analyzed by the students
    3. Source-free series circuits will be analyzed and compared to parallel circuits
    4. Students will predict the complete response for any general circuit

IV. METHODS OF INSTRUCTION

A. Lecture

B. Classroom discussion

C. Homework

V. REQUIRED TEXTBOOK

Cunningham and Stuller; *Basic Circuit Analysis*; (current edition). Boston: Houghton Mifflin

VI. REQUIRED MATERIALS

Calculator

VII. SUPPLEMENTAL REFERENCES

None

VIII. METHODS OF EVALUATION

A. Graded homework

B. Examinations

IX. ADA AA STATEMENT

Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (TC 101; phone 636-481-3169).

X.   ACADEMIC HONESTY STATEMENT

All students are responsible for complying with campus policies as stated in the Student Handbook (see college website, http://www.jeffco.edu).

XI.   ATTENDANCE STATEMENT

Regular and punctual attendance is expected of all students. Any one of these four options may result in the student being removed from the class and an administrative withdrawal being processed: (1) Student fails to begin class; (2) Student ceases participation for at least two consecutive weeks; (3) Student misses 15 percent or more of the coursework; and/or (4) Student misses 15 percent or more of the course as defined by the instructor. Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.

XII.   OUTSIDE OF CLASS ACADEMICALLY RELATED ACTIVITIES

The U.S. Department of Education mandates that students be made aware of expectations regarding coursework to be completed outside the classroom. Students are expected to spend substantial time outside of class meetings engaging in academically related activities such as reading, studying, and completing assignments. Specifically, time spent on academically related activities outside of class combined with time spent in class meetings is expected to be a minimum of 37.5 hours over the duration of the term for each credit hour.