COURSE OUTLINE

ELEC 109 – ELECTRIC CIRCUITS (1) LABORATORY

Prepared By: Stephen E. Frempong
A. **TITLE:** ELECTRIC CIRCUITS (1) LABORATORY

B. **COURSE NUMBER:** ELEC 109

C. **CREDIT HOURS:** 1

D. **WRITING INTENSIVE COURSE:** There is some level of writing for laboratory report in this course. However, it is not considered writing intensive course.

E. **COURSE LENGTH:** 15

F. **SEMESTER(S) OFFERED:** FALL/SPRING

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:** 2- Hours/Week

H. **CATALOGUE DESCRIPTION:** An introductory laboratory course stressing the understanding of basic concepts and principles of direct current/voltage by analyzing resistive, capacitive and inductive circuits through practical laboratory application. Students will also study circuits using circuit analysis software.

I. **PRE-REQUISITES/CO-COURSES:**
(Corequisite: Electric Circuits I (ELEC101) and Pre-Calculus (Math 123)

J. **GOALS (STUDENT LEARNING OUTCOMES)**

   **Institutional Student Learning Objectives (SLO)**
   (1) Communication  (2) Critical Thinking  (3) Professional Competence

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<tr>
<th>Course Objectives / ABET (SLO)</th>
<th>Institutional SLO</th>
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<tr>
<td>An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined engineering technology activities.</td>
<td>3. Professional Competence</td>
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<td>An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes.</td>
<td>3. Professional Competence 2. Critical Thinking</td>
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<td>An ability to apply written, oral, and graphical communication in both technical and non-technical environments; and an ability to identify and use appropriate technical literature;</td>
<td>3. Professional Competence 2. Communication</td>
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K. **TEXTS:** Laboratory Manual to Accompany Introductory Circuit Analysis
L. REFERENCES: Electric Circuits Fundamentals  
By – Floyd ISBN: 0130163945  
Publisher: Prentice Hall

M. EQUIPMENT: Students need to purchase laboratory components (kit) from the bookstore. All other equipment needed will be made available in the lab.

N. GRADING METHOD: Grade based on average of the following: Midterm Exam, Lab Projects / Reports and Final Exam.

O. MEASUREMENT CRITERIA/METHODS: Lab Projects and Lab Test.

Laboratory report may include the following:  
- Names of all team members  
- Name of the course/instructor/date  
- Name of project or circuit  
- introduction  
- List of components used  
- List of test equipment used  
- Schematic or Block diagram  
- Problems you had and how it was overcome  
- Any external information/resources used  
- The basic operation of the circuit  
- Conclusion

Q. LABORATORY OUTLINE:

1. Resistors and the Color Code  
2. Ohm’s Law  
3. Series Resistance  
4. Series dc Circuits  
5. Parallel Resistance  
6. Parallel dc Circuits  
7. Rheostats and Potentiometer  
8. Series-Parallel dc Circuits  
9. Superposition Theorem (dc)  
10. Thevenin’s Theorem and Maximum Power Transfer  
11. Norton’s Theorem and Current Sources  
12. Methods of Analysis  
13. Capacitors  
14. R-L and R-L-C Circuits with a dc Source Voltage  
15. Wheatstone Bridge  
16. Project