MASTER SYLLABUS

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:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

- # Credit Hours: 1 !
- # Lecture Hours:  per week !
- # Lab Hours: 2 per week !
- Other:  per week

Course Length: 15 Weeks

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. **GER CATEGORY:** NONE

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

G. **COURSE 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.

H. **PRE-REQUISITES:** NONE

**CO-REQUISITE:** Electric Circuits I (ELEC101) and Pre-Calculus (Math 123)

I. **STUDENT LEARNING OUTCOMES:**

   **Institutional Student Learning Outcome (ISLO’s)**

**Accreditation Board for Engineering and Technology ABET- Student Outcomes (a-k)**

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<th>Course Objectives</th>
<th>ABET-Student Outcomes (a-k)</th>
<th>ISLO’s</th>
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<td>(a) Correctly measure the currents and voltage of series-</td>
<td>(b) An ability to select and apply the knowledge, techniques, skills, and modern tools of the discipline to broadly-defined</td>
<td>5. Industry, Professional,</td>
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parallel dc network, verify Kirchhoff’s current law, build and test the application of the current divider rule. Engineering technology activities.

(b) Validate conclusions regarding the behavior of capacitors in a steady-state dc network, plot the exponential curve for the voltage across a charging capacitor, and verify the basic equations for determining the total capacitance for capacitors in series and parallel. (c) An ability to conduct standard tests and measurements; to conduct, analyze, and interpret experiments; and to apply experimental results to improve processes.

(b) an ability to select and apply a knowledge of mathematics, science, engineering, and technology to engineering technology problems that require the application of principles and applied procedures or methodologies.

2. Critical Thinking
5. Industry, Professional, Discipline-Specific Knowledge and Skills.

### J. APPLIED LEARNING COMPONENT: LABORATORY

#### K. TEXTS:
Laboratory Manual to Accompany Introductory Circuit Analysis
13/E, By – Boylestad and Kousourou ISBN: 0132196158
Publisher: Prentice Hall

#### 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:
A-F

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

Laboratory report may include the following:
- Names of all team members
P. **DETAILED COURSE OUTLINE:** NONE

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