STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

ELEC 101 – ELECTRIC CIRCUITS (1)

Prepared By: Stephen E. Frempong

SCHOOL OF ENGINEERING TECHNOLOGY
ELECTRICAL ENGINEERING TECHNOLOGY &
ENGINEERING SCIENCE DEPARTMENT
FALL 2018

ELEC 101 – ELECTRIC CIRCUITS 1

A. ! TITLE : ELECTRIC CIRCUITS 1

B. ! COURSE NUMBER: ELEC 101

C. ! CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

 # Credit Hours: 3 !
 # Lecture Hours: 3 **per week** !
 # Lab Hours: per week !
Other: per week

Course Length: 15 **Weeks**

D. WRITING INTENSIVE COURSE: NO

E. GER CATEGORY: NONE

F. SEMESTER(S) OFFERED: FALL

G. COURSE DESCRIPTION: This course focuses on direct current (DC) circuit analysis with enough strength to prepare students for upper level courses in the electrical engineering technology program. Students will analyze resistive, capacitive and inductive circuits and laws/theorems including Kirchhoff's Superposition, Thevenin's, Nortons, and Maximum Power Transfer. Students will develop computational skills. Three hours lecture per week.

H. PRE-REQUISITES: NONE

CO-REQUISITES: Pre-Calculus (MATH 123) or College Algebra (MATH 121), or permission of instructor.

I. ! STUDENT LEARNING OUTCOMES

Institutional Student Learning Outcomes (ISLO's):

(1) Communication (2) Critical Thinking (3) Foundational Skills
(4) Social Responsibility (5) Industry, Professional, Discipline-Specific ! Knowledge and Skills !

ABET Student Outcomes (a-k) !

Course Objectives	Institutional ISLO's	ABET Student Outcomes
a. Identify electrical components (resistors, capacitors, inductors, and etc.)	5. Industry, Professional, Discipline-Specific Knowledge and Skills	
b. Perform circuit analysis and calculations for resistive, capacitive, and inductive DC circuits.	2. Critical Thinking	(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.
c. Apply basic laws and calculations to circuit theorems such as Superposition, Thevenins, and Nortons.	2. Critical Thinking 5. Industry, Professional, Discipline-Specific Knowledge and Skills	(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.

J. <u>APPLIED LEARNING COMPONENT</u>: CLASSROOM

K. <u>TEXTS</u>: Introductory Circuit Analysis 13/e
By – Boylestad
ISBN: 978-0-13-392360-5
Publisher: Prentice Hall

L. ! <u>REFERENCES</u>: Electric Circuits Fundamentals
By – Floyd ISBN: 0130163945
Publisher: Prentice Hall

M. EQUIPMENT: No equipment needed for lecture part of the course with the exception of scientific calculator. If computer is needed, student computer lab is available.

N. GRADING METHOD: Grade based on average of the following: Quizzes, Tests, Midterm Exam, and Final Exam.

O. SUGGESTED MEASUREMENT CRITERIA/METHODS: Tests, Homework, and Quizzes.

P. DETAILED COURSE OUTLINE:

1. **! Introduction**
2. **! Voltage and Current**
3. **! Resistance**

- **Circular Wires**
- **Metric Units**
- **Temperature Effects**
- **Types of Resistors**
- **Color Coding and Standard Resistor Values**
- **Ohmmeters**
- **Thermistors**

4. **! Ohm's Law, Power, and Energy**
5. **! Series dc Circuits**

- **Power Distribution in a Series Circuit**
- **Voltage Sources in Series**
- **Kirchhoff's Voltage Law**
- **Voltage Division in a Series Circuit**
- **Loading Effects of Instruments**

6. **! Parallel dc Circuits**
   - **Power**
   - **Kirchhoff's Current Law**
   - **Current Divider Rule**
   - **Voltage Sources in Parallel**
   - **Voltmeter Loading**

7. **! Series-Parallel Circuits**
8. **! Methods of Analysis and Selected Topics (dc)**
9. **! Network Theorems**
   - **Superposition**
   - **Current Conversions**

- **Voltage Conversions**
- **Thevenin's**
- **Norton's**
- **Mesh Analysis**
- **Bridge Networks**

10. Capacitors

- **Capacitors in Series and Parallel**
- **Energy Stored by a Capacitor**
- **Stray Capacitance**
- **Discharging Phase**

11. Inductors

- **Magnetic Field**
- **Inductance**
- **Induced Voltage**
- **R-L Transients**
- **Instantaneous Values**
- **Energy Stored by an Inductor**
- **Inductors in Series and Parallel**

12. Magnetic Circuits

13. Introduction to AC Circuits

- **Sinusoidal ac Voltage Characteristics**
- **Frequency Spectrum**
- **The Sinusoidal Waveform**
- **General Format for the Sinusoidal Voltage or Current**
- **Phase Relations**
- **Average Value**
- **Effective Value (rms)**
- **Ac Applications**

Q. <u>LABORATORY OUTLINE</u>: NONE