## **ELEC 204: Principles of Electrical Engineering (3 credits)**

This course provides an overview of circuit analysis by reduction methods, source transformations, and mesh and nodal analysis. This course introduces the basic fundamentals of DC machines (Motors, Generators) and transformers. The students will be able to define, identify and categorize the devices that make up rotating machinery. The students will also learn the different characteristics of rotating machinery and transformers along with electric power transmission. Analyse the relationship between the power developed in the primary and secondary of transformer along with electric power transmission.

***Prerequisites:*** *MATH 152 and PHYS 102*

**Course Learning Outcomes:**

By the end of the course, students will be able to:

A1: Demonstrate detailed knowledge of the fundamental concepts related to electricity and electric circuit theory.

A2: Use circuit analysis techniques and computer-based circuit simulation tools in order to determine the electrical properties of the underlying system.

B1: Analyze the relationship between various electrical variables in linear circuits.

B2. Illustrate and evaluate the various energy losses (electrical) of DC generator and motor and understand electrical principle, laws, and working of DC machines.

C1. Operate in teams and take responsibility for the nature and quality of the project output.

**Course Learning Materials:**

* Mano Alexander, C. K., Sadiku, M. (2016). Fundamentals of Electric Circuits (6th Edition). Mc Graw-Hill.

**Course Content:**

1. Basic Electrical circuit Concept
2. Resistive Circuits
3. Circuit Analysis Techniques
4. Network Theorems
5. Energy Storage Elements
6. Transient Circuits
7. Steady state power analysis
8. DC machines, generators and motors
9. Transformers, auto transformers and electric power transmission
10. Project requirements
11. Project presentation
12. Final Exam