Department: Electrical and Computer Engineering

**EEL 3003 — Introduction to Electrical Engineering**

**Curriculum Designation:** Required for CpE majors

**Course (Catalog) Description:** Introduction to electrical engineering concepts for non-electrical engineering majors. Covers a broad range of topics including basic circuit theory, semiconductor devices, instrumentation, amplifiers, and machine. This course will provide the basic principles of current, voltage, and power; resistors, inductors, and capacitors; network theorems and laws; operational amplifiers; phasors; impedances; sinusoidal steady-state analysis.

**Prerequisites:** MAC2312
**Co-requisites:** PHY2049


**Course Objectives:**

1. Calculate power absorbed by element with passive sign convention.
2. Identify relationship between charge versus current, voltage versus energy, and energy versus power.
3. Identify voltage sources versus current sources, independent sources versus dependent sources.
4. Identify the voltage-current characteristics of resistors, capacitors and inductors.
5. Construct equivalent circuits of resistive circuits using series or parallel.
6. Solve a resistive circuit through nodal analysis.
7. Solve a resistive circuit through loop analysis.
8. Identify an Operational Amplifier and its ideal characteristics.
9. Identify a sinusoid with a phasor.
10. Calculate the impedances of circuit elements and RLC circuits.
11. Apply network theorems such as linearity, superposition, Thevenin’s theorem and Norton’s theorem to analyze resistive networks.
12. Solve an AC circuit using nodal analysis, loop analysis and/or other circuit theorems.

**Topics Covered:**

1. Basic circuit theory.
2. Principles of voltage, current and power.
3. Passive devices such as resistors, capacitors, and inductor.
4. Operational amplifiers.
5. AC Steady State Analysis
Class Schedule: Three 50- or two 75-minute lectures per week (3 credit hours).

Subject Area: Engineering

Significant Design: No

Relationship to Assessed ABET Student Outcomes: None

Last Updated by: R.J. Perry                 Date: April 30th, 2021