EE 221

1. **Course Number & Name:** EE 221, Electric Circuits Laboratory
2. **Course Credit and Contact Hours:** 1 Unit, 3 hours
3. **Course Coordinator:** Dr. Mohamed Salem
4. **Textbook:** Charles K. Alexander and Matthew N. O. Sadiku, *Fundamentals of Electric Circuits*, 6th Edition, McGraw Hill., 2016, ISBN 978-0078028229
5. **Supplemental Materials:** Lab instructions and lab exercise information will be provided, Multisim by National Instruments (available in the lab)
6. **Specific Course Information:**
   a. **Description:** Laboratory work on material treated in EE 220 emphasizing elementary design principles.
   b. **Prerequisites:** EE 110, CS 115, and MATH 211, or consent of instructor
   c. **Co-Requisite:** EE 220 and PHYS 214, or consent of instructor
   d. **Status:** ☑ Required for EE program, ☐ Elective, ☐ Selected Elective
7. **Specific Goals for the Course:**
   a. **Specific outcomes of instruction:** Upon successful completion of this course the students will be able to:
      i. Construct circuits on breadboard and perform measurements using digital multimeters, oscilloscopes, and functional generators.
      ii. Measure voltages and currents in electric circuits.
      iii. Conduct experiments to verify basic electric circuit laws.
      iv. Use simulation software to analyze circuits.
      v. Test first order circuits with steady state and transient input and draw phasor diagrams.
      vi. Conduct basic AC measurements.
      vii. Measure amplitude and frequency response of low pass filters and draw bode plot.

viii. Work collaboratively in a team.

b. This course supports the following ABET Student Outcomes:

i. *SO-5: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.*

ii. *SO-6: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.*

8. Brief List of Topics to be Covered:

a. Ohm's law
b. Series and parallel resistors and Kirchhoff's laws
c. Methods of circuit analysis
d. Introduction to circuit simulation
e. Thevenin's & Norton's equivalent circuits
f. Oscilloscope and signal/function generator
g. First-order circuits
h. Sinusoids, phasors, and AC power analysis
i. Frequency response of a low-pass filter