EE 230

1. Course Number & Name: EE 230, Electronics I
2. Course Credit and Contact Hours: 3 Units, 3 hours
3. Course Coordinator: Dr. Mohamed Salem
5. Supplemental Materials: None
6. Specific Course Information:
   a. Description: Theory, characteristics, and operation of diodes, bipolar junction transistors, and MOSFET transistors; analog and digital electronic circuits; design and analysis of analog electronic circuits such as filters, operational amplifiers, and single and multistage amplifiers; modeling and simulation using spice/multisim software.
   b. Prerequisites: EE 220 and EE 221, MATH 211, and CS 115
   c. Co-Requisite: EE 231
   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. Understand principles of semiconductor materials and $pn$-junctions.
      ii. Understand principles of practical op-amps, diodes, MOS transistors, bipolar junctions transistors.
      iii. Characterize op-amps, diodes, MOS transistors, bipolar junctions transistors.
      iv. Design, analyze, utilize circuits containing op-amps, diodes, and transistors.
      v. Calculate the gain and frequency response of amplifiers.
      vi. Design amplifiers to meet desired specifications.
   b. This course supports the following ABET Student Outcomes:
      i. $SO-1$: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
8. **Brief List of Topics to be Covered:**
   
a. Signals and frequency spectra  
b. Amplifier types  
c. Operational-amplifier circuits  
d. Semiconductors  
e. The pn-junction  
f. Diodes and their circuits  
g. Metal-oxide-semiconductor field-effect-transistors (MOSFETs) principles and biasing  
h. Bipolar junction transistors (BJTs) principles and biasing