

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
- 4. Textbook:** Adel S. Sedra and Kenneth C. Smith, *Microelectronic Circuits*, 7th Edition, Oxford University Press, 2015. ISBN 978-0-19-933913-6.
- 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