

**ELC 131**  
**CIRCUIT ANALYSIS I**

**COURSE DESCRIPTION:**

Prerequisites: None

Corequisites: MAT 121

This course introduces DC and AC electricity with emphasis on circuit analysis, measurements, and operation of test equipment. Topics include DC and AC principles, circuit analysis laws and theorems, components, test equipment operation, circuit simulation software, and other related topics. Upon completion, students should be able to interpret circuit schematics; design, construct, verify, and analyze DC/AC circuits; and properly use test equipment. Course Hours Per Week: Class, 3. Lab, 3. Semester Hours Credit, 4

ee. Maintain a clean and organized work environment.

ff.

- II. Current and voltage
  - A. Electric current (electron and conventional)
    - 1.) Coulomb unit
    - 2.) Ampere unit
  - B. Potential difference
    - 1.) Definition of potential difference and voltage gradient
    - 2.) Unit - volt
    - 3.) Difference between voltage, PD, EMF, 'E', "V"
    - 4.) Sources of potential difference
      - (a) Batteries
      - (b) Generators
      - (c) Thermocouples
      - (d) Others
  
- III. Resistance
  - A. Definition of resistance
  - B. Ohm's law
  - C. Resistors
    - 1.) Types
      - (a) Function
      - (b) Construction
    - 2.) Color code
  
- IV. Electrical power and energy
  - A. Power and energy
  - B. Joule's law
  - C.
  - B

- VII. Static electricity
  - A. Static charge
  - B. Electrostatic induction
  - C. Capacitance
    - 1.) Capacitors in series
    - 2.) Capacitors in parallel
  - D. Charging a capacitor
  - E. Discharging a capacitor
  
- VIII. Electromagnetism
  - A. Magnetism
  - B. Electromagnetism induction
  - C. Inductance
    - 1.) Inductors in series
    - 2.) Inductors in parallel
  - D. Instantaneous current in an inductor
  
- IX. Introduction to alternating current
  - A. AC r67 Tw 3 2current

- 2.) Fault prediction
  - (a) Possible faults
  - (b) Effects on circuit performance
- B. Analysis symptoms to isolate performance
  - 1.) system or module level
  - 2.) Circuit level
  - 3.) Component level
- C. Possibl Possible faul1-3(t)-3(s1-3 0.46C65eEMC /P ✖AMCID 6 BDC 0.00032Tw T(25(W)Patch(1,