Basic Electrical Technology

Introduction

Dr. LakshmanRao S. Paragond
Faculty Dept of Electrical and Electronics Engg
laxman.sp@manipal.edu
Mobile : 9448835163

Course Outline: BET [ELE 1051] $\langle [L\ T\ P\ C] = [2\ 1\ 0\ 3] \rangle$

- **DC Circuit Analysis:**
  - Circuit elements, Sources, Resistance, Inductance, Capacitance, Mesh Current and Node Voltage Analysis, Superposition, Thevenin's and Max Power Transfer Theorems

- **Magnetic Circuit Analysis and Electromagnetism:**
  - Magnetism, Laws of magnetism, series and parallel magnetic circuits, Electromagnetic induction, Magnetic coupling, induced emfs, mesh current equations

- **Single phase AC Circuit Analysis:**
  - Generation, Representation, AC through R, L and C, Series and parallel circuits, Power, Power factor, Resonance in series and parallel AC circuits

Course Outline ELE 1051 [2 1 0 3]

- **3 phase AC Circuit Analysis:**
  - Generation, Representation, Types of connection – Star & Delta, Analysis of balanced and unbalanced loads, Measurement of Power

- **Overview of Power System Components:**
  - Electrical Power System – An overview, Generation, Transmission, Distribution, Utilization of Electric Power; Overview of Electrical Machines, Types, working principle & applications; Measurement of Energy: Energy meters

Course Plan

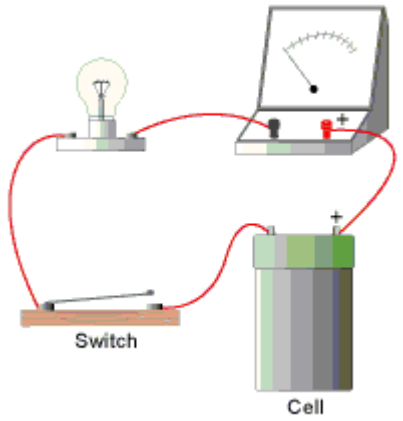
Assessment

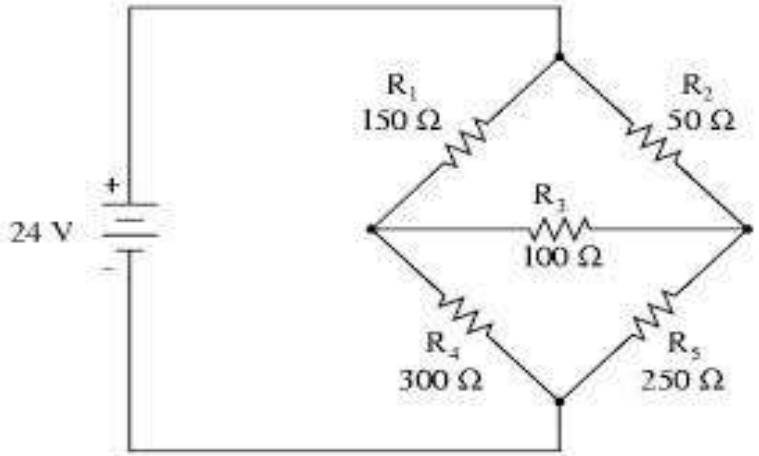
- **In-Semester Assessment - 50%**
  - **2 Sessionals: 15 marks each – 1 hour duration**
  - **4 Quizzes : 5 marks each – 20 minutes**
- **End-Semester Examination – 50%**
  - **Written Examination : 50 marks – 3 hours duration**
  - **Minimum Pass Marks for End Semester Exam: 18 marks**
- ***In order to clear the course a student must secure minimum pass marks (which could be between 35 to 50 marks) which is calculated by adding the marks obtained in In-Semester and End-Semester Exams.***
- **All questions are to be answered**
- Attendance requirement : 75 % (which is regularly updated in SLcM)
- NO use of Mobiles in the classroom.
- Maintain Lecture Notes
- Bring Calculators

What is an Electric Circuit?

Definition:

"An interconnection of simple electrical devices with at least one closed path in which current may flow"





Circuit Elements

- **Active & Passive**
  - Active Elements: Voltage & Current Source
  - Passive Elements: Resistor, Inductor & Capacitor
- **Linear & Non-linear Elements**
  - Linear: Resistor, Inductor, Capacitor
  - Nonlinear: Diode, LDR (Light Dependent Resistor), Thermistor, transistor
- **Unilateral & Bilateral Elements**
  - Unilateral (Current Flow in one direction): Diode, Transistor
  - Bilateral: Resistor, Inductor, Capacitor*
- **Lumped & Distributed**

Discuss only ***lumped linear bilateral*** circuit elements