Course Name: ELECTRIC CIRCUIT THEORY LABORATORY
Course Code: EE 391
Credit: 2

Prerequisites:

Sl. No.	Subject	Description	Level of Study
01	Mathematics	Vector , Calculus, Laplace, Fourier, Graph Theory	Class XII, 1st Sem, 3rd sem
02	Physics	Electrostatics, Electromagnetism	1st Sem, 2nd Sem

Course Objective:

- To illustrate the students different electrical circuit and their application in practice.
- To evaluate the use of computer-based analysis tools to review performance of networks.
- To impart knowledge on assessing transient behavior of electrical circuit(R-L, R-C, and R-L-C etc.).
- To determine parameters of two port networks
- To realize characteristics of various filter circuit.
- To understand frequency domain response of circuits and signals.

Course Outcomes:

At the end of the course, a student will be able to:

CO1. **Identify** relevant information to supplement to the Electric Circuit theory (EE301) course. **Develop** experimental procedures on different types of electrical circuits and **analyze** their operation under different operating conditions.

CO2. **Set up** testing strategies and select proper process to evaluate and understand operation of electrical networks. **Practice different** types of solution technique and topologies keeping in mind technical, economical, safety issues.

CO3. **Combine** an understanding of the established principles, theories, concepts and terminology relevant to electric circuits with some constraints, uncertainties and risks that exist in practical laboratory experimentation. **Use** of computer-based analysis tools (MATLAB, PSPICE etc.) to review performance of electrical circuit.

CO4. **Prepare** professional quality textual and graphical presentations of laboratory data and computational results, incorporating accepted data analysis and synthesis methods, mathematical software, and processing tools.

CO5. Primarily via team-based laboratory activities, students will **develop** the ability to interact effectively on a social and interpersonal level with fellow students, and will **demonstrate** the ability to divide and share task responsibilities to complete assignments.

CO6. **Originate** a professional experience in circuit solution on working in a power plant or any practical field and to be ready for life-long involvement in the farther improvement of relevant technology.

CO- PO mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
EE 391. 1	3	2	1	-	3	3	-	-	-	-	-	1
EE 391. 2	2	1	2	2	2	2	-	-	-	1	-	-
EE 391. 3	1	2	1	-	3	1	1	1	-	-	-	-
EE 391. 4	1	2	-	1	2	-	-	-	-	-	-	-
EE 391. 5	-	-	2	-	-	-	-	-	2	1	2	-
EE 391. 6	-	-	-	2	-	2	2	1	-	-	-	3

Correlation levels 1, 2 or 3 as defined above: 1: Slight (Low) 2: Moderate (Medium)3: Substantial (High) and "-" if there is no correlation.

Syllabus Indicating CO:

Module No.	Content	Relevant CO's
1	Transient response of R-L and R-C network: simulation with PSPICE /Hardware	**CO1, CO2, CO3, CO4, CO5**
2	Transient response of R-L-C series and parallel circuit: Simulation with PSPICE/ Hardware	**CO1, CO2, CO3, CO4, CO5**
3	Determination of Impedance (Z) and Admittance (Y) parameter of two port network: Simulation /Hardware.	**CO1, CO2, CO4, CO5**
4	Frequency response of LP and HP filters: Simulation / Hardware.	**CO1, CO2, CO3, CO4, CO5**
5	Frequency response of BP and BR filters: Simulation /Hardware.	**CO1, CO2, CO3, CO4, CO5**
6	Generation of Periodic, Exponential, Sinusoidal, Damped Sinusoidal, Step, Impulse, Ramp signal using MATLAB in both discrete and analog form.	**CO1, CO2, CO3, CO4, CO5**
7	Determination of Laplace transform and Inverse Laplace transform using MATLAB.	**CO1, CO2, CO3, CO4, CO5**
8	Amplitude and Phase spectrum analysis of different signals using MATLAB.	**CO1, CO2, CO3, CO4, CO5**
9	Verification of Network theorem using SPICE	**CO1, CO2, CO3, CO4, CO5,CO6**