ELECTRICAL ENGINEERING SIMULATION LABORATORY

III Semester: EEE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
AEE105	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	-	3	2	30	70	100
Contact Classes: Nil	**Tutorial Classes: Nil**	**Practical Classes: 48**				**Total Classes: 48**		

OBJECTIVES:

The **course should enable the students to:**
  I.   Measure the active and reactive power in a three phase system
  II. Draw the locus diagram of electric circuits
  III. Calculate the two port network parameters of electric circuit
  IV. Understand the transient response of series and parallel circuits and Design the low pass and high pass filters
  V.   Analyse the basic waveforms using Fourier transform, Visio, Lab view.

COURSE LEARNING OUTCOMES (CLOs):

The students should enable to:

  1. Measurement of three phase active power and reactive power.
  2. Plot the locus diagram of series RL and RC circuits.
  3. Calculate Z, Y of two port network.
  4. Determine ABCD, h parameters of the two port network.
  5. Analysis of square wave, half wave and full wave rectified sine wave using Fourier transforms.
  6. Draw the electrical symbols using VISIO software.
  7. Study and plot the transient response of series and parallel RL and RC circuits.
  8. Analyze transient response of series and parallel RLC circuit.
  9. Design Of Low Pass And High Pass Filters.
  10. Editing and building a VI, creating a sub VI.
  11. Analyze VIs using FOR loop, WHILE loop, charts and arrays, graph.
  12. Generate signals of triangular wave, saw tooth, square wave and display of wave form, minimum, maximum values of wave form and modulation.
  13. Display the Three phase sine wave generation.
  14. Measure of Frequency using Lissajous figures in LabView.
  15. Explore the knowledge and skills of employability to succeed in national and international level competitive examination.

LIST OF EXPERIMENTS	
Week-1	**MEASUREMENT OF THREE PHASE ACTIVE POWER AND REACTIVE POWER**
Measurement of three phase active and reactive power for balanced and unbalanced loads.	
Week-2	**LOCUS DIAGRAMS**
Plot the locus diagram of series RL and RC circuits.	

Week-3	**IMPEDANCE(Z) AND ADMITTANCE(Y) PARAMETERS**
To calculate and verify 'Z' parameters and 'Y' parameters of two-port network.	
Week - 4	**TRANSMISSION (ABCD) AND HYBRID(H) PARAMETERS**
To calculate and verify 'ABCD' parameters and 'H' parameters of two-port network.	
Week - 5	**FOURIER ANALYSIS**
Fourier analysis of square wave, half wave rectified and full wave rectified sine wave using MATLAB.	
Week - 6	**ELECTRICAL SYMBOLS USING VISIO SOFTWARE**
Draw the electrical symbols using VISIO software.	
Week - 7	**TRANSIENT RESPONSE OF RL AND RC CIRCUITS USING DIGITAL SIMULATION**
To study and plot the transient response of series and parallel RL and RC circuits using MATLAB.	
Week - 8	**TRANSIENT RESPONSE OF RLC CIRCUITS USING DIGITAL SIMULATION**
To study and plot the transient response of series and parallel RLC circuit using MATLAB.	
Week - 9	**DESIGN OF LOW PASS AND HIGH PASS FILTERS USING DIGITAL SIMULATION**
Simulation of low pass and high pass filters using digital simulation.	
Week - 10	**VIRTUAL INSTRUMENTS (VI) USING LABVIEW**
Editing and building a VI, creating a sub VI.	
Week - 11	**STRUCTURES USING LABVIEW**
Using FOR loop, WHILE loop, charts and arrays, graph and analysis VIs.	
Week - 12	**GENERATION OF COMMON WAVE FORMS USING LABVIEW**
Signal generation of triangular wave, saw tooth, square wave and display of wave form, minimum and maximum values of wave form and modulation.	
Week - 13	**SINE WAVE GENERATION USING LABVIEW**
Three phase sine wave generation and display.	
Week - 14	**FREQUENCY MEASUREMENT USING LABVIEW**
Frequency measurement using Lissajous figures in LabView.	
Text Books:	

1. A Chakrabarthy, "Electric Circuits", DhanpatRai& Sons, 6th Edition, 2010.
2. A Sudhakar, Shyammohan S Palli, "Circuits & Networks", Tata McGraw- Hill, 4th Edition, 2010.
3. Nesimiertugrul, "Labview for electric circuits, machines, drives, and laboratories", prentice hall, 1st Edition, 2002.

REFERENCES:

1. John Bird, "Electrical Circuit Theory and technology", Newnes, 2nd Edition, 2003.
2. C. L. Wadhwa, "Electrical Circuit Analysis including Passive Network Synthesis", New Age International, 2nd Edition, 2009.
3. David A. Bell, "Electric circuits", Oxford University Press, 7th Edition, 2009.