ELECTRICAL SIMULATION LAB

Course Code	20EE3653	**Year**	III	**Semester (s)**	II
Course Category	Professional Core	**Branch**	EEE	**Course Type**	Lab
Credits	1.5	**L-T-P**	0-0-3	**Prerequisites**	Circuit theory, Power Electronics, Power Systems
Continuous Internal Evaluation:	15	**Semester End Evaluation:**	35	**Total Marks:**	50

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	**Determine** the performance of Power System networks in various software tools. (L3)
CO2	**Analyse** the performance of Power Electronics circuits in simulation Softwares. (L4)
CO3	**Determine** the performance of basic electrical, electronics and Control System circuits in the software tools. (L3)
CO4	Conduct experiments as a team / individual by using the software available in the laboratory
CO5	Make an effective report based on experiments.

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3			3	3				3			3	3	1
CO2		3			3				3			3	3	1
CO3	3		3		3				3			3	3	1
CO4				3	3				3				3	1
CO5										3			3	1

S. No.	Experiment	Mapped COs
1	Analysis of three phase power system representing the generator, transmission line and load.	CO1, CO4, CO5
2	Fault analysis of a power system.	
3	Power Flow solution of a power system by Newton Raphson method.	
4	Simulation of single – phase full converter using R, RL & RLE loads.	CO2, CO4, CO5
5	Simulation of single phase AC voltage controller using R, RL & RLE loads.	
6	Simulation of Buck Chopper.	
7	Simulation of Resonant Pulse Commutation Circuit.	
8	Simulation of single phase inverter with PWM control.	
9	Modelling of electrical machine (DC motor).	

10	Simulation of D. C. circuit for determining thevenin‘s equivalent & norton‘s equivalent.	CO3, CO4, CO5
11	Response of an RLC circuit by parametric analysis.	
12	Simulation of op- Amp based integrator & differentiator circuits.	
13	PID –open loop & closed loop control.	

Learning Resources
Text Books
1. Schaum's outline series—Basic circuit analysis, McGraw-Hill Professional, 2012 2. Robert L. Boylestad, Louis Nashelsky, Electronic Devices and Circuits Theory, 10/e, Pearson Education, 2009. 3. M. H. Rashid, Power Electronic Circuits Devices and Applications, 4th edition, Pearson.
Reference Books
1. Handbook on MATLAB, Getting Started Guide, The Mathworks 2. PSCAD User’s Guide, Manitoba HVDC Research Centre
e- Resources & other digital material
1. https://in.mathworks.com/help/physmod/simscape/ug/op-amp-circuit-inverting-amplifier.html 2. https://www.pscad.com/software/pscad/overview 3. https://powersimtech.com/