

ELECTRICAL TECHNOLOGY LABORATORY

III Semester: ECE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AEE114	Core	L	T	P	C	CIA	SEE	Total
		-	-	3	2	30	70	100
Contact Classes: Nil		Tutorial Classes: Nil		Practical Classes: 42			Total Classes: 42	

OBJECTIVES:

The course should enable the students to:

1. Apply different techniques used in electric circuit analysis to calculate two port network parameters.
2. Conduct various tests on DC shunt machines to calculate the efficiency and to control speed.
3. Determine the performance characteristics, voltage regulation and efficiency of single phase transformer by conducting various tests.
4. Demonstrate the transient response of series RL and RC circuits.

COURSE LEARNING OUTCOMES (CLOs)

At the end of the course, the student will have the ability to:

1. Demonstrate the transient response of series RL and RC circuit and obtain the time constant.
2. Understand impedance and admittance parameters along with its governing equations.
3. Understand transmission and hybrid parameters along with its governing equations.
4. Understand the open circuit characteristics of DC shunt generator
5. Determine the efficiency of DC shunt generator by conducting load test
6. Determine the efficiency of DC shunt motor by conducting load test.
7. Predict the efficiency of DC shunt generator and DC shunt motor without loading the machine.
8. Study the various speed control techniques of Dc shunt motor
9. Estimate equivalent circuit parameters, efficiency, and voltage regulation of a single phase transformer by conducting open circuit and short circuit test.
10. Determine the efficiency single phase transformer by directly load test.
11. Understand the transient response of series and parallel RLC circuits using digital simulation.
12. Analysis of low pass and high pass filters using digital simulation.
13. Understand open circuit characteristics of DC shunt generator using SIMSCAPE power systems.
14. Understand load test on DC shunt generator using SIMSCAPE power systems.

LIST OF EXERCISES

Week - 1	RC AND RL NETWORKS
Time response of first order RC and RL networks.	
Week - 2	Z AND Y NETWORKS
Determination of impedance (Z) and admittance (Y) parameters of two port network.	
Week - 3	ABCD AND HYBRID PARAMETERS
Determination of transmission and hybrid parameters of two port network.	

Week – 4	OPEN CIRCUIT CHARACTERISTICS OF DC SHUNT GENERATOR
Plot the Magnetization characteristics of a DC shunt generator.	
Week - 5	LOAD TEST ON DC SHUNT GENERATOR
Determination of efficiency by conducting load test on DC shunt generator.	
Week - 6	NO LOAD TEST ON DC SHUNT MACHINE (SWINBURNE’S TEST)
Predetermination of efficiency of a DC shunt machine.	
Week – 7	BRAKE TEST ON DC SHUNT MOTOR
Study the performance characteristics of DC shunt motor on load.	
Week - 8	SPEED CONTROL OF DC SHUNT MOTOR
Study the speed characteristics of a DC shunt motor.	
Week - 9	OC AND SC TEST ON SINGLE PHASE TRANSFORMER
Determination of equivalent circuit parameters and plot the performance characteristics of a single phase	
Week - 10	LOAD TEST ON SINGLE PHASE TRANSFORMER
Plot the efficiency of single phase transformer for various loads.	
Week - 11	TRANSIENT RESPONSE OF RLC CIRCUIT
Study and plot the transient response of series and parallel RLC circuit using digital simulation.	
Week - 12	HIGH PASS AND LOW PASS FILTERS
Analysis of low pass and high pass filters using digital simulation.	
Week - 13	MAGNETIZATION CHARACTERISTICS OF DC SHUNT GENERATOR
Open circuit characteristics of DC shunt generator using SIMSCAPE power systems.	
Week - 14	DIRECT TEST ON DC SHUNT GENERATOR
Load test on DC shunt generator using SIMSCAPE power systems.	
Text books	
<ol style="list-style-type: none"> 1. V K Mehta, —”Principles of Electrical Engineering”, S Chand Publications, Re print, 2005. 2. I J Nagarath, D P Kothari, —”Theory and Problems of basic electrical engineering”, PHI Publications, 1st Edition, 2013. 3. Sudhakar and Shyam Mohan, —Electrical Circuits, McGraw Hill Publication, 3rd Edition, 2015. 4. P S Bimbra, —Electrical Machines, Khanna Publishers, New Delhi, 2004 	
References	
<ol style="list-style-type: none"> 1. A Chakrabarhty, —Electric Circuits, Dhanipat Rai & Sons Publication 6th Edition, 2010. 2. I J Nagrath, D P Kothari, —Electrical Machines, Tata Mc Graw Hill Publication, New Delhi, 2nd Edition, 2010. 3. N C Jagan and C Lakhminaraya, —Network Analysis, BS Publications 2nd Edition, 2011. 	
Web References	
<ol style="list-style-type: none"> 1. https://www.ee.iitkgp.ac.in 2. https://www.citchennai.edu.in 3. https://www.iare.ac.in 	