COMPUTATIONAL LAB

Electrical systems are generally very complex in nature and large in size and hence physical models are difficult to realize in laboratory. The aim of this laboratory is to provide required simulation facilities to the students in order to do the necessary analyses of the concepts learnt in their respective courses. This lab facility is being used by B.Tech & M.Tech students of the department for carrying out mini projects, term papers, major projects in addition to meeting the academic lab work.

Area in sq.m	:	200
Established in the year	:	2001
Total investment made (Rs.)	:	58,66,568/-
Major equipment	:	86 terminals with Configuration Intel(R) Core (TM i3-2100 CPU @3.50GHz processor, 4GB RAM, 500GB hard disk
Licensed Software available in the lab	:	MATLAB (7.1V), PSPICE, PSCAD/EMTDC (4.0V), MULTISIM (10V), LABVIEW, AUTOCAD,ANSYS Software.

Lab Utilization :	Lab name	Branch
	C Programming	EEE & EIE
	Engineering Drawing with Auto CAD	EEE
	Objected Oriented Programming (C++)	EEE
	Mini Project	EEE
	Major Project	EEE
	Data Structure	EEE
	Project based Lab Experimentation	EEE

List of Experiments

Lab VIEW

1. Solving simple differential (1_{st} and 2_{nd} order) equations & formulae.
2. Verification of Ohm's &Kirchoff's laws for dc excitations
3. Analysis of Voltage and Current divider circuits.
4. Calculation of Equivalent resistance for Series and Parallel circuits.
5. Calculation of Equivalent resistance using star/delta transformations

MATLAB

6. Analysis of R, RL and RC circuits for dc and ac excitations
7. Plot the characteristics of impedance, reactance and current with frequency for series and parallel resonant circuits. Also calculate resonant frequency, BW and Q-factor.
8. Plot the current locus diagrams for series and parallel R-L, R-C circuits
9. Verification of Thevenin's& Norton's theorems.
10. Verification of the Maximum power transfer theorem.

MULTISIM

11. Solution of non-linear algebraic equation using Newton-Rapson method.
12. Verification of Superposition & Reciprocity theorems using PSPICE (with dependence and independence sources)

Faculty Incharge : Mr. B. Pangadaiah
Lab Technician : Mr. P. Vajraiah

M.TECH. SIMULATION LABORATORY

M.Tech. Simulation Lab plays an important role in designing, analyzing modern power electronic and power system applications. This laboratory is equipped with modern simulation tools usefulfor post graduates taking the Power Converters & Drives course.

Area in sq.m : 40
Established in the year : 2013
Total investment made(Rs) : 27,327,82/-

Major equipment :

1. 1 terminal with Configuration Intel P-IV @ 1.7 GHz, 1GB DDR RAM, 40 GB Hard disk

2. 2 terminals with Configuration Intel Celeron processor, 64MBR RAM, 10.2GB HDD capacity

3. 5 terminals with Configuration HCL P-IV @1.7GHZ, 1GB Ram, 80 GB Hard disk

4. 10 terminals with Configuration Wipro P-IV @2.5GHZ, 256MB Ram, 40 GB Hard disk

Licensed Software available in the lab :

1. DigSILENT Power Factory V14, 25 Users LAN License (All Modules)

2. ETAP, 5 User LAN (7 Modules)

3. Xilinx ISE Design Suite 13.4, 25 User LAN

Lab Utilization :	Purpose	Semester
	Power Converters and Drives Lab-I	M.TechIstSem
	Power Converters and Drives Lab-II	M.TechIIndSem
	PG Technical Seminar	M.TechIstSem
	PG Mini Project	M.TechIIndSem
	PG Main Project	M.TechIInd Year

Simulation of Power Converters & Drives-I Lab

LIST OF EXPERIMENTS

Simulation based:

1. Switching characteristics of power diode, BJT, MOSFET, IGBT and SCR
2. Output voltage and current characteristics of 1-phase step down cyclo converter with R & RL loads for different firing angles
3. Output voltage and current characteristics of 3-phase IGBT based PWM Inverter on R & R-L loads
4. Output voltage and current characteristics of diode clamped multi level inverter with R & RL loads using PWM technique
5. Speed control of three phase converter controlled dc motor drive using PWM technique

6. Starting and Running characteristics of capacitor start & capacitor run single phase induction motor using PWM control technique
7. Torque and speed characteristics of four quadrant chopper fed dc motor drive
8. Determination of speed and output voltage of 3-phase A.C. Voltage controller fed induction motor drive using PWM technique
9. Speed control of 3 phase Induction motor with SPWM technique
10. Output voltage and current characteristics of flying capacitors multi level inverter fed to induction motor drive using PWM technique

Additional Experiments

11. Torque and speed control of 3 phase slip ring Induction motor by Static Rotor Resistance Control using control switches
12. Torque and speed control of three phase induction motor drive using vector control technique

Simulation of Power Converters & Drives-II Lab

LIST OF EXPERIMENTS

Simulation based:

1. Power factor correction boost converter using PWM technique
2. Load voltage & current characteristics of isolated dc-dc resonant converter using PWM technique
3. Load voltage & current characteristics of dc-dc buck converter using PWM and pulse delay control techniques
4. Load & source voltage and current characteristics of dc-dc buck boost converter with R & RL loads using hysteresis PWM control technique

5. Load voltage & current characteristics of dc-dc forward converter with R & RL loads using hysteresis PWM control technique
6. Load voltage & current characteristics of dc-dc cuk converter with R & RL loads using PWM control technique
7. Load voltage & current characteristics of dc-dc fly back converter with R & RL loads using hysteresis PWM control technique
8. Speed control of PM synchronous motor by voltage control method
9. Speed control of BLDC motor by voltage control method
10. Speed control of switched reluctance motor using PWM control technique

Additional Experiments

1. Load voltage & current characteristics of push-pull dc-dc converter with R & RL loads using PWM control technique
2. Load voltage & current characteristics of full bridge dc-dc converter with R & RL loads using PWM control technique

Faculty Incharge : Mr. J. V. Pavan Chand
Lab Technician: Mr. P. Vajraiah