

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY
K.K.DISTRICT
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
POWER ELECTRONICS & DRIVE LABORATORY

Equipment's Available in the Lab

Sl.No	Name of the Equipments
1.	Microcontroller kit
2.	DSP(Texas / Analog 2000 platform) kit
3.	FPGA board kit
4.	3 Phase inverter with control circuit
5.	Single phase rectifier
6.	3 phase control rectifier
7.	DC Chopper
8.	DC-DC converter (BOC,BBC,BUC)
9.	DC-DC converter(Resonant)
10.	Power converter for SRM
11.	DC motor and load setup
12.	Induction motor and load setup
13.	SRM motor with load setup
14.	Stepper motor with load setup
15.	PMSM motor with load setup
16.	BLDC motor with load setup
17.	3 Phase auto transformer
18.	1 phase auto transformer
19.	Power supply(Single)
20.	Power supply(Dual)
21.	1 phase isolation transformer
22.	3 Phase isolation transformer
23.	3 Phase induction motor
24.	Fault condition monitoring kit
25.	Fault condition simulator kit
26.	Program downloader
27.	Online UPS (3 KVA)
28.	Exide SF sonic battery
29.	CRO
30.	SCR and MOSFET transient trainer kit
31.	Desktop computer with LCD monitor
32.	SCR Characteristics kit
33.	MOSFET Characteristics kit
34.	TRIAC Characteristics kit
35.	IGBT Characteristics kit
36.	SCR firing circuit module(Global)

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

K.K.DISTRICT

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

37.	SCR firing circuit module(Vi)
38.	SCR based half controlled converter(Global)
39.	SCR based half controlled converter(Vi)
40.	SCR based fully controlled converter(Global)
41.	SCR based fully controlled converter(Vi)
42.	MOSFET based step up chopper
43.	MOSFET based step down chopper
44.	IGBT based 1 phase PWM inverter module(Global)
45.	IGBT based 1 phase PWM inverter module(Vi)
46.	IGBT based 3 phase PWM inverter module(Global)
47.	IGBT based 3 phase PWM inverter module(Vi)
48.	IGBT based high switching frequency chopper
49.	SCR based single phase AC phase controller
50.	TRIAC based single phase AC phase controller
51.	SCR/ DIAC / TRIAC based single phase AC phase controller
52.	SCR based V/I commutated chopper(Global)
53.	SCR based V/I commutated chopper(Vi)
54.	3Phase motor for 3Phase inverter
55.	1Phase motor for 1Phase inverter
56.	3Phase inductive load
57.	DSO
58.	Single phase inductive load
59.	Step down transformer (230/24)V
60.	Step down transformer (230/6)V
61.	Power supply(+15/-15)V
62.	Solar PV module
63.	PV Emulator
64.	Solar-Wind Hybrid model
65.	Micro Wind Energy Generator
66.	Computer

COURSES OFFERED

Sl.No	Odd Sem (Course code & Name)	Class	Even Sem (Course code & Name)	Class
1	EE3511-Power Electronics Laboratory	III Year EEE	EE3271 -Electric Circuits Laboratory	I Year EEE
2	EE8712-Renewable Energy Systems laboratory	IV Year EEE		

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY
K.K.DISTRICT
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ODD SEMESTER

EE3511 -POWER ELECTRONICS LABORATORY

COURSE OBJECTIVES:

- To study the VI characteristics of SCR, TRIAC, MOSFET and IGBT.
- To analyze the performance of semi converter, full converter, step up, step down choppers by simulation and experimentation.
- To study the behavior of voltage waveforms of PWM inverter applying various modulation techniques.
- To design and analyze the performance of SMPS.
- To study the performance of AC voltage controller by simulation and Experimentation.

COURSE OUTCOMES:

Upon the successful completion of the course, students will be able to:

CO1: Determine the characteristics of SCR, IGBT, TRIAC, MOSFET and IGBT

CO2: Find the transfer characteristics of full converter, semi converter, step up and step downchoppers by simulation experimentation.

CO3: Analyze the voltage waveforms for PWM inverter using various modulation techniques.

CO4: Design and experimentally verify the performance of basic DC/DC converter topologies used for SMPS.

CO5: Understand the performance of AC voltage controllers by simulation and experimentation

LIST OF EXPERIMENTS:

1. Characteristics of SCR and TRIAC.
2. Characteristics of MOSFET and IGBT.
3. AC to DC half controlled converter.
4. AC to DC fully controlled converter.
5. Step down and step up MOSFET based choppers.
6. IGBT based single phase PWM inverter.
7. IGBT based three phase PWM inverter.
8. AC Voltage controller.

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

K.K.DISTRICT

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

9. Switched mode power converter.

10. Simulation of PE circuits (1 Φ & 3 Φ semi converter, 1 Φ & 3 Φ full converter, dc-dc converters, ac voltage controllers).

EE8712 RENEWABLE ENERGY SYSTEMS LABORATORY

OBJECTIVES:

- To train the students in Renewable Energy Sources and technologies.
- To provide adequate inputs on a variety of issues in harnessing Renewable Energy
- To recognize current and possible future role of Renewable energy sources.

OUTCOMES:

CO1: Ability to understand and analyze Renewable energy systems.

CO2: Ability to train the students in Renewable Energy Sources and technologies.

CO3: Ability to provide adequate inputs on a variety of issues in harnessing Renewable Energy.

CO4: Ability to simulate the various Renewable energy sources.

CO5: Ability to recognize current and possible future role of Renewable energy sources.

CO6: Ability to understand basics of Intelligent Controllers.

LIST OF EXPERIMENTS

1. Simulation study on Solar PV Energy System.
2. Experiment on “VI-Characteristics and Efficiency of 1kWp Solar PV System”.
3. Experiment on “Shadowing effect & diode based solution in 1kWp Solar PV System”.
4. Experiment on Performance assessment of Grid connected and Standalone 1kWp Solar Power System.
5. Simulation study on Wind Energy Generator.
6. Experiment on Performance assessment of micro Wind Energy Generator.
7. Simulation study on Hybrid (Solar-Wind) Power System.
8. Experiment on Performance Assessment of Hybrid (Solar-Wind) Power System.
9. Simulation study on Hydel Power.
10. Experiment on Performance Assessment of 100W Fuel Cell.
11. Simulation study on Intelligent Controllers for Hybrid Systems.

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY
K.K.DISTRICT
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

EVEN SEMESTER

EE3271 ELECTRIC CIRCUITS LABORATORY

COURSE OBJECTIVES:

- To simulate various electric circuits using Pspice/ Matlab/e-Sim / Scilab
- To gain practical experience on electric circuits and verification of theorems

COURSE OUTCOMES:

CO1: Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit

CO2: Use simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin, Norton and maximum power transfer) for the given DC/AC circuit

CO3: Analyze transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods

CO4: Analyze frequency response of the given series and parallel RLC circuit using simulation and experimentation methods

CO5: Analyze the performance of the given three-phase circuit using simulation and experimental methods

LIST OF EXPERIMENTS

Familiarization of various electrical components, sources and measuring instruments

1. Simulation and experimental verification of series and parallel electrical circuit using fundamental laws.
2. Simulation and experimental verification of electrical circuit problems using Thevenin's theorem.
3. Simulation and experimental verification of electrical circuit problems using Norton's theorem.
4. Simulation and experimental verification of electrical circuit problems using Superposition theorem.
5. Simulation and experimental verification of Maximum Power transfer theorem.
6. Simulation and Experimental validation of R-C, R-L and RLC electric circuit transients
7. Simulation and Experimental validation of frequency response of RLC electric circuit.
8. Design and implementation of series and parallel resonance circuit.

MARTHANDAM COLLEGE OF ENGINEERING AND TECHNOLOGY

K.K.DISTRICT

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

9. Simulation and experimental verification of three phase balanced and unbalanced star, delta networks circuit (Power and Power factor calculations).