ER.PERUMAL MANIMEKALAI COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOMES (M.E -POWER ELECTRONICS AND DRIVES)

REGULATION: 2017

S.NO	COURSE NAME	COURSE OUT COMES	
1	C101- Applied Mathematics for Electrical Engineering	C101.1	Apply various methods in matrix theory to solve system of linear equations
		C101.2	Maximizing and minimizing the functional that occur in electrical engineering discipline
		C101.3	Computation of probability and moments, standard distributions of discrete and continuous random variables and functions of a random variable
		C101.4	Could develop a fundamental understanding of linear programming models, able to develop a linear programming model from problem description, apply the simplex method for solving linear programming problems.
		C101.5	Fourier series analysis and its uses in representing the power signals
2	C102- Power Semiconductor Devices	C102.1	Determine the suitable device for the application.
		C102.2	Design of semiconductor device and its parameters.
		C102.3	Design of protection circuits and control circuits
		C102.4	Determine the reliability of the system
		C102.5	Applying the protection circuits of semiconductor devices
3	C103- Analysis of ElectricalMachines	C103.1	Understand the various electrical parameters in mathematical form
		C103.2	Analysis of DC machines and simulation
		C103.3	Understand the different types of reference frame theories and transformation relationships
		C103.4	Analysis of AC machines and modeling of electrical machines.
		C103.5	Find the Synchronous machine equivalent circuit parameters and modeling of electrical machines.
4	ysis and Design of r Converters	C104.1	Analyze various single phase and three phase power converters
		C104.2	Select and design dc-dc converter topologies for a broad range of power conversion applications.
		C104.3	Develop improved power converters for any stringent application requirements.

	C104- Anal Powe	C104.4	Design dc-dc converters and analysis
		C104.5	Design ac-ac converters for variable frequency applications
5	C105- System Theory	C105.1	Ability to represent the time-invariant systems in state space form as well as analyze, whether the system is stabilizable, controllable, observable and detectable
		C105.2	Design state feedback controller and state observers
		C105.3	Classify singular points and construct phase trajectory using delta and isocline methods.
		C105.4	Use the techniques such as describing function, Lyapunov Stability, Popov's Stability Criterion and Circle Criterion to assess the stability of certain class of non-linear system.
		C105.5	Describe non-linear behaviors such as Limit cycles, input multiplicity and output multiplicity, Bifurcation and Chaos
6	C106- Control System Design for Power Electronics	C106.1	Understand an overview on modern linear and nonlinear control strategies for power electronics devices
		C106.2	Model modern power electronic various converters for industrial applications
		C106.3	Design various linear converters
		C106.4	Design appropriate controllers for modern power electronics devices
		C106.5	Design nonlinear controllers for modern power electronics devices
7	C107- Power Electronics Circuits Lab	C107.1	Comprehensive understanding on the switching behavior of Power Electronics witches
		C107.2	Comprehensive understanding on mathematical modeling of power electronic system and ability to implement the same using simulation tools
		C107.3	Use microcontroller and its associated IDE* for power electronic applications
		C107.4	design and implement analog circuits for Power electronic control applications
		C107.5	Design and fabricate a power converter circuit at an reasonable power level and Exposure to PCB designing and fabrication
8	C108- Analysis and Design of Inverters	C108.1	Will get expertise in the working modes and operation of single phase inverters
		C108.2	Design of three phase voltage control inverter
		C108.3	Design of three phase current source inverter modes and various techniques
		C108.4	Acquire knowledge on multilevel inverters and modulation techniques
		C108.5	Will equip skills to formulate and design the inverters for generic loads and machine loads

9	C109- Solid State Drives	C109.1	Ability to explain about steady state and dynamic operation of motor load system and apply the multi quadrant dynamics in hoist load system.
		C109.2	Analyze the single phase, three phases fully controlled converter and Chopper fed Separately excited dc motor drives using steady state analysis and discuss the various controls Strategies of Converter.
		C109.3	Ability to explain the operation and characteristics of various methods of solid state speed Control of induction motor.
		C109.4	Describe the operation of various control modes of synchronous motor drives
		C109.5	Design a current and speed controller and develop the transfer function for DC motor, load and converter, closed loop control with current and speed feedback
10	C110 - Special Electrical Machines	C110.1	understand the open loop and closed loop systems stepper motors
		C110.2	Understanding the classifications and characteristics of special machines
		C110.3	Understanding of the control methods of special motors.
		C110.4	Ability to select the suitable motor for a certain job under given conditions
11	C111- Power Quality	C111.1	Ability to understand various sources, causes and effects of power quality issues, electrical systems and their measures and mitigation.
		C111.2	Ability to analyze the causes & Mitigation techniques of various PQ events.
		C111.3	Ability to understand the concepts about Voltage and current distortions, harmonics.
		C111.4	Ability to analyze and design the passive filters, active filters and acquire knowledge on compensation techniques.
		C111.5	Ability to acquire knowledge on DVR.
12	C112 - Flexible AC Transmission Systems	C112.1	Understand the basic operation and its applications in power system.
		C112.2	Understand the operation of the static voltage compensator and its applications in power system
		C112.3	understand the operation of the compensator and its applications in power system
		C112.4	Understand the various emerging Facts controllers.
		C112.5	Ability to know about the genetic algorithm used in Facts controller coordination.
13	- Modern Rectifiers And Resonant Converters	C113.1	Apply the concept of various types of rectifiers
		C113.2	Simulate and design the operation of resonant converter and its importance
		C113.3	Identify the importance of linear system, state space model, PI controller
		C113.4	Design the DC power supplies using advanced techniques

	C113	C113.5	Understand the standards for supply current harmonics and its significance.
14	C114 - Electrical Drives Laboratory	C114.1	Ability to simulate different types of machines, converters in a system.
		C114.2	Analyze the performance of various electric drive systems.
		C114.3	Ability to perform both hardware and software simulation.
15	C115- Mini Project	C115.1	Acquire practical knowledge within the chosen area of technology for project development
		C115.2	Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach
		C115.3	Contribute as an individual or in a team in development of technical projects
		C115.4	Develop effective communication skills for presentation of project related activities
		C115.5	Design a proto type model of project
16	C201 - High Voltage Direct Currenttransmission	C201.1	Understand the concepts of high voltage DC power transmission
		C201.2	Apply various converter used to HVDC system
		C201.3	Understand the various types of HVDC systems and control techniques
		C201.4	Understand the various power flow analysis of HVDC systems and control techniques
		C201.5	Design various simulation model for HVDC systems
17	C202- Solar And Energy Storage Systems	C202.1	Develop more understanding on solar energy storage systems
		C202.2	Develop basic knowledge on standalone PV system
		C202.3	Understand the issues in grid connected PV systems
		C202.4	Students will study about the modeling of different energy storage systems and their performances
		C202.5	Students will attain more on different applications of solar energy
	tronics For ysystems	C203.1	Understand the knowledge about the stand alone and grid connected renewable energy systems
		C203.2	Derive the criteria for the design of power converters for renewable Energy applications.

18	C203 - Power Elec Renewable Energ	C203.3	Design different power converters namely AC to DC, DC to DC and AC to AC converters for renewable energy systems
		C203.4	Analyze and comprehend the various operating modes of wind electrical generators and solar energy systems.
		C203.5	Develop maximum power point tracking algorithms and wind energy systems
19	C204 - Project Work Phase I	C204.1	Identify the real world problems of electrical engineering.
		C204.2	Understand the working of various models in the electrical engineering systems.
		C204.3	Apply the principles of electrical engineering in the real world systems.
		C204.4	Criticize and experiment to arrive at solution for the electrical engineering problems.
		C204.5	Explain the solution by effective presentation with simulation models
20	C205 - Project Work Phase II	C205.1	Criticize and experiment to arrive at solution for the electrical engineering problems with hardware .
		C205.2	Explain the solution by effective presentation and involved active member in the team leads to lifelong learning.
		C205.3	Make prototype’s model of project