Koneru Lakshmaiah Education Foundation
(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)
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Department of Electrical and Electronics Engineering
Program: M. Tech – Power Electronics & Drives
Academic Year: 2018-2019

Course Code	Course Title	CO NO	Description of the Course Outcome
18EE5109	Modeling and Analysis of Electrical Machines	CO1	Apply the basic concepts of Electromagnetic Energy Conversion Principles to DC Machines
		CO2	Understand the performance of electrical machines through mathematical modeling
		CO3	Illustrate the dynamic behaviour of electrical machines under different operating conditions
		CO4	Analysis of special machines
18EE5110	Analysis of Power Converters	CO1	Analyze the various 3-phase controlled rectifiers and power factor correction converters with different load and
		CO2	Analyze the performance of Switch-Mode PWM and different control techniques for Inverters
		CO3	Analyze the performance of dc-dc switch regulators with CCM and DCM operation.
		CO4	Understand the operations and performance of various ac-ac regulators with different loads and its.
		CO5	Demonstrate and test basic power electronic converters by hardware realization and MATLAB software.
18EE5111	Power Electronic Control Of Drives	CO1	Analyze ac-dc and dc-dc converter fed DC motor drives
		CO2	Understand converter fed stator side control of Induction Motor drives.
		CO3	Analyze rotor side control and slip power recovery scheme of 3-phase Induction Motor drives
		CO4	Analyze frequency control of Synchronous Motor drives for variable speed operation
		CO5	Demonstrate and test various electrical drives by hardware and MATLAB software tools.
18EE5104	Modern Control Theory	CO1	Understand the basics of Z-Transforms and Digital control systems DCS components
		CO2	Apply various stability analysis technics to digital control systems
		CO3	Apply various stability analysis technics to non-linear control systems
		CO4	Apply the basics of optimal control problem to state feedback controller design
		CO3	Understand the operation of off shore wind power plants
		CO4	Analyze the operation of floating solar and off shore power system

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18EE5113	Advanced Power Converters	CO1	Analyze the concepts of Resonant switch Converters, L-type, M-type, Load resonant converters
		CO2	Analyze the operation of soft switched isolated converter and Quasi resonant inverter
		CO3	Analyze the concept of Z-source to inverter and analyze the concept of multi-level to inverters, Analysis and comparison of Multi level Inverters
		CO4	Apply different PWM techniques for Multi-level inverters, Apply the Concept of Matrix converter for direct AC-AC conversion
		CO5	Analyze the concepts of Advanced power converters through Lab experiments
18EE5114	Advanced Electrical Drives	CO1	Understand the modeling of AC machines
		CO2	Contrast the speed control performance of 3-Phase induction and synchronous motor drive using vector control methods
		CO3	Analyze the dynamic behavior of SRM motor drives under various control methods
		CO4	Distinguish the performance of BLDC Motor drive using various control techniques
18EE5116	FPGA controllers and Applications	CO1	Understand the neural network, different architectures with different learning types and various algorithms for ANN to solve the load forecasting problems in Power systems.
		CO2	Apply the fuzzy logic concept, fuzzy sets, with suitable membership function with proper de-fuzzification method to control the load frequency in power systems
		CO3	Understand the Genetic algorithm, encoding, Genetic operators, Reproduction operators, mutation operators, fitness functions, Genetic modeling
		CO4	Apply the different cross over methods and their elitism, convergence of algorithm and able to develop and analyze the algorithm to economic dispatch problem.
18EE5207	Smart Grids Technologies	CO1	Understand the basic concepts of smart grid, terminology, challenges and initiatives.
		CO2	Understand various smart operations of power system structure, components, and monitoring techniques.
		CO3	Apply smart metering and advanced metering infrastructure with monitoring, protection and measuring units.
		CO4	Apply various communication protocols and cyber-security importance in smart grid.

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18EE51E1	Microcontrollers and Applications	CO1	Outline functional and operational features of PIC18C7X micro-controller
		CO2	Demonstrate programming of PIC18C7X
		CO3	Develop interfacing of PIC18C7X to analog and digital controller components
		CO4	Apply PIC18C7X programming to real time control applications
18EE51E2	Digital Simulation of Power Electronic Systems	CO1	Understand PSPICE modeling of power semiconductor devices and passive components behavior with protection circuits.
		CO2	Analyze performance of AC-DC controlled, uncontrolled converters and DC-DC converters using Pspice and Matlab Simulink model.
		CO3	Evaluate DC-AC converters performance using modern simulation tools.
		CO4	Analyze AC voltage controller and cyclo-converter performance with programming and simulation tools.
18EE51E3	Industrial Control Electronics	CO1	Outline switch mode power supplies for Industry usage
		CO2	Demonstrate Industrial control process electronic components
		CO3	Identify opto-electronic applications to industrial processes
		CO4	Apply control of servo-motor based industrial processes
18EE51F1	Soft Computing Techniques	CO1	Demonstrate model, learning and training methods of Artificial Neural networks
		CO2	Apply Genetic algorithms to engineering problems
		CO3	Demonstrate characteristics of Fuzzy systems
		CO4	Apply Neual netwotks and fuzzy logic to motor control s
18EE52C1	FACTS Devices	CO1	Interpret the significance of FACTS devices in power system
		CO2	Demonstrate the operation and control of shunt compensation devices
		CO3	Demonstrate the operation and control of series compensation devices
		CO4	Demonstratetheoperation and applications of special FACTS devices like UPFC and IPFC
18EE52D2	Power Quality	CO1	Outline basic power quality issues
		CO2	Demonstrate conventional loop control for voltage and current balance
		CO3	Demonstrate DSTATCOM for power quality restoration
		CO4	Apply combined compensation techniques for power quality restoration
18EE51B2	Digital Signal Processors and Applications	CO1	Outline components of digital signal processing
		CO2	Demonstrate Architecture of TMS320C5X, TMS320C6X and ADSP-21XXprocessors
		CO3	Demonstrate programming of functional units of TMS320C5X, TMS320C6X and ADSP-21XX
		CO4	Develop Signal conditioning and PWM applications with TMS320C5X, TMS320C6X and ADSP-21XX processors

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18EE52H2	Electric and Hybrid Vehicles	CO1	Demonstrate Mechanics of Electric vehicle
		CO2	Demonstrate Power train components of Electric vehicle
		CO3	Apply controllers to electric vehicle drive system
		CO4	Outline energy storage systems for Electric vehicles
18EE51B3	Optimization Techniques	CO1	Understand classical optimization techniques, describe clearly the problems with and without constraints, identify its parts and analyze the individual functions, Feasibility study for solving an optimization problem.
		CO2	Apply mathematical translation of the verbal formulation of an optimization problem and design algorithms of linear programming problems, the repetitive use of which will lead reliably to finding an approximate solution.
		CO3	Analyze and measure the performance of an algorithm of different methods to solve non-linear programming problems, study and solve optimization problems.
		CO4	Analyze optimization techniques using algorithms. Investigate study, develop, organize and promote innovative solutions for various applications.
18EE52C3	Adaptive Control Systems	CO1	Outline elements of propbability and Stochastic processes
		CO2	Demonstrate parametric and non-parmetric system models
		CO3	Interpret adaptive control techniques to linear systems
		CO4	Apply adaptive control process and asses stability of linear systems
18EE52H3	Power Electronics for Renewable Energy Systems	CO1	Interpret Power electronic power modulators for PV power utilization
		CO2	Interpret Power electronic power modulators for wind power utilization
		CO3	Illustrate hybrid PV-wind power integration to grid
		CO4	Demonstrate model, sizing and interface of micro-grids
18EE52D1	EHVAC & HVDC Transmission	CO1	Outline operational parameters of EHV-AC transmission
		CO2	Demonstrate various HVDC links
		CO3	Develop insulation design and coordination for HVDC system
		CO4	Demonstrate mechanical design of towers for HVDC and EHV-AC transmission

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