Koneru Lakshmaiah Education Foundation
(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)
Accredited by NAAC as 'A++' Approved by AICTE ISO 21001:2018 Certified
Campus: Green Fields, Vaddeswaram - 522 502, Guntur District, Andhra Pradesh, INDIA
Phone No. +91 8645 - 350 200, www.klef.ac.in, www.klef.edu.in, www.kluniversity.in
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Department of Electrical and Electronics Engineering
Program: M.Tech - POWER ELECTRONICS AND POWER SYSTEMS
Academic year: 2023-2024

Course Code	Course Title	CO NO	Description of the Course Outcome
23UC5201	PROFESSIONAL COMMUNICATION SKILLS	CO1	To develop the skill of contextual Vocabulary and Critical Reading
		CO2	To demonstrate different types of personal and professional skills and apply them for growth in professional zone.
		CO3	Apply the concepts of Mathematical Principles to solve problems on Arithmetic , Algebra & Geometry to improve problem solving ability.
		CO4	Apply the concepts and using Logical thinking to solve problems on verbal & Non-Verbal Reasoning to develop Logical thinking skills.
23EE5207	MATLAB PROGRAMMING FOR ENGINEERS	CO1	Apply the fundamentals of MATLAB
		CO2	Analyze the characteristics of electrical system using MATLAB.
23EE5101	PYTHON PROGRAMMING FOR ELECTRICAL SYSTEMS	CO1	Understand Conditionals, Iterables, Regex, Files, Error Handling, Data Structures, Algorithm design and Object Oriented Python
		CO2	Apply object-oriented programming, Python Standard Library,SciPy's optimization and Signal Processing and Linear algebra
		CO3	Apply Data Analysis using Pandas. Apply supervised Learning and Unsupervised Learning techniques using Scikit-Learn
		CO4	Analyse real world electrical engineering problems using pandapower and PyPSA for power system modeling, analysis and optimization.
		CO5	Analyze the applications of Python programming for electrical engineering applications
23EE5102	ADVANCE POWER CONVERTERS	CO1	Analyze the various high power converters and power factor correction.
		CO2	Analyze the performance of Switch-Mode PWM and different control techniques of Inverters
		CO3	Apply the principles and usage of multi-level inverters and Z-source inverter.
		CO4	Understand the various applications of power converters with solar systems.

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		CO5	Demonstrate and test basic power electronic converters by hardware realization and MATLAB software.
		CO6	Analyze the various converters application using software tools
23EE5104	POWER SYSTEM STABILITY & CONTROL	CO1	Understand the power system stability
		CO2	Apply the small signal stability to power systems
		CO3	Analyze Excitation control and Voltage Stability
		CO4	Analyze power system security control
		CO5	Test the small signal stability and power system security using MATLAB
23EE5212	ADVANCED ELECTRIC DRIVES	CO1	Model dunamics of AC machines
		CO2	Analyze vector control of three phase induction motor
		CO3	Analyze SRM drive performance
		CO4	Analyze BLDC motor drive performance
23EE5213	DIGITAL CONTROLLERS	CO1	Apply programming principles of FPGA
		CO2	Develop digital protection and PWM applications with FPGA control
		CO3	Apply programming principles of sequential digital Processor
		CO4	Develop power conversion control with digital processor
23EE5111	MODELLING AND ANALYSIS OF ELECTRICAL MACHINES	CO1	Apply the basic concepts of Electromagnetic Energy Conversion Principles to DC Machines
		CO2	Understand the mathematical model of three phase induction motor.
		CO3	Illustrate the dynamic behavior of synchronous machines under different operating conditions.
		CO4	Analysis of special machines
23EE51F1	OPTIMIZATION TECHNIQUES	CO1	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	Design and 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	Evaluate 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.

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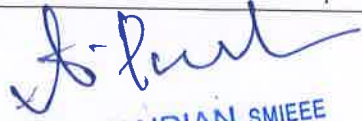Green Fields, Vaddeswaram,
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23EE51F2	RELIABILITY ENGINEERING & APPLICATION TO POWER SYSTEMS	CO1	Understand the system reliability concepts
		CO2	Apply the frequency and duration techniques for component repairable system.
		CO3	Apply the network reliability concepts to generation system reliability analysis.
		CO4	Apply the network reliability concepts to transmission and distribution system reliability analysis.
		CO5	Test the network reliability using MATLAB
23EE51B2	ENERGY STORAGE SYSTEMS	CO1	Understand batteries' basic chemistry, figure of merits, energy, and power density limits
		CO2	Identify the advantage and disadvantages of using alternative battery types
		CO3	Examine battery testing standards, battery charging systems and state of charge measurement techniques
		CO4	Learn about a variety of applications such as automotive and grid-energy storage systems
23EE51B1	EV BATTERIES & CHARGING SYSTEM	CO1	Analyze the LLC resonant converters topology for EV charger.
		CO2	Apply battery system for EV and cell balancing.
		CO3	Apply the Wireless Power Transfer charging techniques for Electric Vehicles
		CO4	Apply the charger infrastructure system and impact with grid
		CO5	Analyze the EV charger converters using software tools
23EE52C2	ENERGY CONSERVATION & AUDIT	CO1	Understand the concept of Energy Audit and Energy Management
		CO2	Compare energy efficient motors and normal motors
		CO3	Analyse the different energy instruments and importance of power factor improvement
		CO4	Analyse the economic aspects of electrical energy
23EE52G1	FACTS & POWER QUALITY	CO1	Understand the importance of FACTS devices and their applications to Power Systems.
		CO2	Analyze the static shunt and series compensation and operation of devices under this category.
		CO3	Apply DSTATCOM for power quality restoration
		CO4	Apply combined compensation techniques for power quality restoration and fault ride-through.

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23EE52H1	DIGITAL SIMULATION OF POWER ELECTRONIC SYSTEMS	CO1	Apply the Pspice modelling of power semiconductor devices and passive components behavior with protection circuits
		CO2	Apply the controllers on AC-DC controlled, uncontrolled converters and DC-DC converters using Pspice and MATLAB Simulink model.
		CO3	Apply the DC-AC converters performance using modern simulation tools
		CO4	Apply various the performance analysis of PWM methods of voltage control in single phase
23EE52H2	SWITCHED MODE POWER SUPPLY AND PWM TECHNIQUES	CO1	Analyse the Non-isolated dc-dc converter under CCM and DCM operation
		CO2	Apply the modelling of SMPS and output stage amplification.
		CO3	Analyse the Isolated dc-dc converters under various modes and high frequency transformer design.
		CO4	Apply the various modes of bidirectional dc-dc converters in different control strategy.
23IE5201	ESSENTIALS OF RESEARCH DESIGN	CO1	Illustrate Research objects, steps involved in research and articulate appropriate Research Questions
		CO2	Perform Literature Review in a Scholarly style and apply appropriate methods for Data collection
		CO3	Represent the data in tabular/Graphical form and prepare data for analysis
		CO4	Perform statistical modelling and analysis to optimize the data, prepare the data for publishing.
23EE53E1	BATTERY MANAGEMENT SYSTEMS	CO1	Select suitable battery for electric vehicle
		CO2	Analyse the key functions of Battery management systems
		CO3	Analyse various mathematical models of battery
		CO4	Evaluate Algorithms for SOC estimation of battery
23EE53E2	GREEN BUILDINGS AND SMART CITIES	CO1	Understand the principles of green buildings and
		CO2	Environmental impact of buildings
		CO3	Apply the Energy management and conservation strategies
		CO4	Analyze the smart sub-station operation and applications in smart grids.

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