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, RPP SOP, 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 -ELECTRRICAL & ELECTRONICS ENGINEERING
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.

Dr. A. PANDIAN, SMIEEE
Professor & HOD
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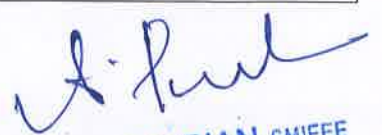|			
		CO4	Understand the various applications of power converters with solar systems.
		CO5	Demonstrate and test basic power electronic converters by hardware realization and MATLAB software.
		CO6	Analyze the various converters application using software tools
23EE5104	POWER SYSTEM STABILITY & CONTROL	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
23EE5205	DIGITAL CONTROL SYSTEMS	CO1	Apply the Z and inverse Z-transforms for sampling process
		CO2	Analyze the stability of nonlinear systems
		CO3	Analyze the formulation of the optimal control problems
		CO4	Analyze the digital controller with bilinear transformation
23EE5103	ADVANCED POWER SYSTEM ANALYSIS & PROTECTION	CO1	Apply the modeling aspects of power system components and form the network matrices
		CO2	Apply mathematical methods for the solution of Power flow problem
		CO3	Analyze of power system with symmetrical and unsymmetrical faults
		CO4	Apply digital relaying algorithms for protection of power system
23EE5206	SMART GRID TECHNOLOGIES	CO1	Understand the basic concepts of smart grid, terminology, challenges, and initiatives.
		CO2	Identify 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	Understand smart grid appliances
23EE51A1	ELECTRIC VEHICLE POWER TRAIN DESIGN	CO1	Understand the History, Economics, Environmental issues and power train of Electric Vehicles
		CO2	Analyze the dynamics of EV
		CO3	Select and size the power train for 2W
		CO4	Select and size the power train for 4W
		CO5	Demonstrate the working of power train components of EV

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23EE51A2	GRID INTEGRATION OF RENEWABLE ENERGY SYSTEMS	CO1	Apply the acquired knowledge to design and analyze basic renewable energy systems with a focus on grid integration.
		CO2	Apply grid integrated techniques for solar PV System
		CO3	Apply grid integrated techniques for wind energy System
		CO4	Apply the grid operation and control methods and standards
		CO5	Analyze the practical skills and techniques effectively integrate renewable energy systems into the grid
23EE51B1	EV BATTERIES & CHARGING SYSTEM	CO1	Understand the characteristics of sensors and actuators used for electric vehicle control
		CO2	Apply various microcontrollers for digital control of electric vehicle
		CO3	Analyze the communication protocols for data communication in electric vehicle control system
		CO4	Analyze the Model fault diagnosis system for electric vehicle
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
23EE52C1	FAULT DIAGNOSIS AND CONTROL OF ELECTRIC VEHICLE	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

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23EE52D1	AI AND IOT FOR MODERN ELECTRICAL VEHICLES	CO1	Understand the IoT devices and tools
		CO2	Understand the cloud system Environment to EV
		CO3	Applying ML Techniques for Electric Vehicles
		CO4	Applying AI techniques for EV Applications
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.
23EE52D2	AI AND IOT FOR GREEN ENERGY SYSTEMS	CO1	Understand the usage of basic cloud services
		CO2	Apply Embedded Programming to upload sensor data to cloud
		CO3	Analyze the data in cloud through AL/ML Services
		CO4	Develop application for green energy technologies using cloud tools

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