

KLEF  
Department of EEE  
Y22 M.TECH POWER ELECTRONICS AND POWER SYSTEMS

SL	Course Code	Course Title	CO NO	Description of the Course Outcome
1	22EE5112	Analysis Of Power Converters	CO1	Analyze the various high power controller converters and power factor correction.
			CO2	Analyze the performance of Switch-Mode PWM and different control techniques for Inverters
			CO3	Analyze the operation of multi-level to inverters and Z-source inverter.
			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.
2	22EE5102	Advanced Power System Analysis and Protection	CO1	Apply mathematical methods for the solution of Power flow problem
			CO2	Analyze of power system with symmetrical and unsymmetrical faults
			CO3	Apply power system protection equipment
			CO4	Apply digital relaying algorithms for protection of power system equipment
3	22EE5113	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
4	22EE5104	Embedded Controllers and Applications	CO1	Apply Programming of 8051 Microcontroller for general purpose applications
			CO2	Apply programming concepts of 8051 for interfacing peripherals
			CO3	Demonstrate Architecture and Programming of PIC Microcontoller
			CO4	Apply programming concepts of 8051 and PIC Microcontroller for interfacing peripherals
			CO5	Apply programming concepts of the 8051and PIC microcontroller
5	22EE5211	Advanced Electrical	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

5	22EE5211	Drives	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
6	22EE5212	POWER SYSTEM STABILITY & CONTROL	CO1	Analyze Synchronous Machine modeling
			CO2	Analyzing power system stability
			CO3	Analyze Small signal stability
			CO4	Analyze Excitation control and Voltage Stability
7	22EE5213	GRID INTEGRATION OF RENEWABLE ENERGY SYSTEMS	CO1	Understand renewable energy Systems
			CO2	Apply grid integrated techniques for solar PV System.
			CO3	Apply grid integrated techniques for wind energy System.
			CO4	Understand grid operation and control methods and standards.
8	22EE5204	AI and IoT for Modern Electrical Systems	CO1	Demonstrate IoT devices and tools
			CO2	Operate the cloud system Environment
			CO3	Utilize AI and ML Techniques
			CO4	Utilize AI techniques for electrical systems
9	22EE51A1	RELIABILITY ENGINEERING	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.
10	22EE51A2	Application of Python Programming in 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	Understand 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
11	22EE51A3 :	ENERGY MANAGEMENT SYSTEMS	CO1	Understand data acquisition components of power system
			CO2	Understand energy data monitoring, reporting and communication
			CO3	Apply supervisory control for energy management
			CO4	Understand Energy management center functions

12	22EE51B1 :	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.
13	22EE51B2	Advanced Control Theory	CO1	Apply the mathematical representation to dynamic systems
			CO2	Apply the techniques to design the controllers
			CO3	Apply the techniques to identify non linear system stability
			CO4	Apply the algorithms for stability analysis
14	22EE51D3	DEREGULATED POWER SYSTEMS	CO1	Understand the market operations in the electricity market under deregulated environment, Open Access Same-time Information System (OASIS) and Available Transfer Capability (ATC).
			CO2	Analyze the concepts of Electricity Pricing.
			CO3	Analyze the Power System Operation in Competitive Environment and Market Power.
			CO4	Analyze the concepts of Transmission Pricing and Congestion pricing.
15	22EE52A1	Digital Simulation of Power Electronic Systems	CO1	Design of non-isolated and isolated DC-DC converters
			CO2	Understand the working of Resonant converters
			CO3	Modelling of non-isolated DC -DC converters
			CO4	Design of closed loop controls for switched mode power supplies
16	22EE52A2	Switched Mode Power Supplies	CO1	Understand Pspice modelling of power semiconductor devices and passive components behaviour with protection circuits.
			CO2	Analyse 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	Analyse AC voltage controller and cyclo-converter performance with programming and simulation tools.
			CO1	Understand the importance of FACTS devices and their applications to the Power Systems.

17	22EE52C3	FACTS & Power Quality	CO2	Analyse 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.
18	22E52D1	: 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	Illustrate various communication protocols and cyber-security importance in smart grid.
19	22E52D2	ENERGY CONSERVATION & AUDIT	CO1	Understand the concept of Energy Audit and Energy Management
			CO2	Analyze the various characteristics of energy efficient motors
			CO3	Analyze the different energy instruments and importance of power factor improvement
			CO4	Analyze the economic aspects of electrical energy
20	22E52D3	Smart Appliance and Smart Cities	CO1	Evaluate the characteristics of smart home appliances.
			CO2	Understand the essential elements of smart cities
			CO3	Analyze the Characteristics of a Smart City
			CO4	Apply the Designing, and Implementing a Smart City