Koneru Lakshmaiah Education Foundation
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Department of Electrical and Electronics Engineering

Program: M. Tech – Power Systems

Academic Year: 2019-2020

Course Code	Course Title	CO NO	Description of the Course Outcome
18EE5102	Advanced Power System Analysis	CO1	Understand 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	Analyze the operation of power system under different contingencies
		CO5	Test the Power system problems using computer programming.
18EE5101	Power System Dynamics & Stability	CO1	Analyze Synchronous Machine modeling
		CO2	Analyzing power system stability
		CO3	Analyze Small signal stability
		CO4	Analyze Excitation systems and Voltage Stability
18EE5103	Deregulated Operation Of 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.
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

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19EE52D1	Floating Solar and Off -Shore wind Technologies	CO1	Understand basic concepts of smart grid in power network
		CO2	Analyzing swing equation and equal area criterion
		CO3	Understand synchronous machine modeling
		CO4	Understand excitation systems and power system stabilizers
18EE51A2	Distribution System Planning & Automation	CO1	Understand the power and its quality and system planning
		CO2	Understand the design and operation of distribution feeders and loading of transformers.
		CO3	Understand the consumer services in distribution system.
		CO4	Understand the capacitor importance in distribution system and the SCADA with required components and its function.
18EE5205	Real Time Control of Power System	CO1	Analyze the load frequency control of power system
		CO2	Analyze the economic operation of power system
		CO3	Understand Computer control of power systems
		CO4	Analyze the security control and state estimation
18EE5206	AI Techniques in Power Systems	CO1	Able to Demonstrate the neural network, different architectures with different learning types and various algorithms for ANN to solve the load forecasting problems in Power systems.
		CO2	Use 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	Able to 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	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.

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18EE5208	Digital Protection of Power System	CO1	Understand the operation of protective equipment and adaptive protection
		CO2	Apply various transforms for digital protection of power system
		CO3	Analyze the microprocessor based relays for the protection of power system equipment
		CO4	Analyze travelling wave, AI and FPGA based relays for the protection of power system equipment
18EE52C1	FACTS Devices	CO1	Understand the importance of FACTS devices and their applications to the Power Systems.
		CO2	Analyze the static shunt compensation and operation of devices under this category.
		CO3	Analyze the static series compensation and operation of devices under this category.
		CO4	Analyze the operation and applications of 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
19EE52D1	Floating Solar and Off -Shore wind Technologies	CO1	Understand the selection of floating solar power plant
		CO2	Understand different layouts and selection of converters
		CO3	Understand the operation of off shore wind power plants
		CO4	Compare the operation of floating solar and off shore with power operation
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

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		CO4	Develop Signal conditioning and PWM applications with TMS320C5X, TMS320C6X and ADSP-21XX processors
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
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
19EE52D3	Energy Management Systems	CO1	Outline data acquisition components of power system
		CO2	Demonstrate energy data monitoring, reporting and communication
		CO3	Apply supervisory control for energy management
		CO4	Illustrate Energy management centre functions
18EE51A1	Reactive Power Compensation & Management	CO1	Distinguish the importance of load compensation in symmetrical as well as un symmetrical loads
		CO2	Examine various compensation methods in transmission lines
		CO3	Construct model for reactive power coordination
		CO4	Distinguish demand side reactive power management & user side reactive power management
18EE52C2	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
18EE51A3	Power System Reliability	CO1	Understand the system reliability concepts
		CO2	Apply the frequency and duration techniques for component repairable system.

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		CO3	Apply the network reliability concepts to generation system reliability analysis.
		CO4	Apply the network reliability concepts to transmission and distribution system reliability analysis.
18EE51B1	Alternative Sources of Electrical Energy	CO1	Understand the concept of Renewable energy resources, Distribution Generation and demand side management
		CO2	Analyze the working of Photovoltaic Power Plants
		CO3	Analyze the working of wind power plant and fule cells
		CO4	Analyze the importance of energy storage systems in Distributed Generation
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	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

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