COURSE OUTCOMES

Electrical & Electronics Engineering

Course Outcome (CO)
2015 Scheme (Even Semester)

	EE 402 Special Electric Machines
CO1	Analyse the performance of different types of permanent magnet motors.
CO2	Analyse the performance of a stepper motor.
CO3	Analyse the performance of different types of reluctance motors.
CO4	Explain the construction and principle of operation of servo motors, single phase motors and linear motors.
CO5	Analyse the performance of linear induction motors.
	EE 404 Industrial Instrumentation & Automation
CO1	To enable students to select instruments and transducers for various physical variables
CO2	To get an insight on data acquisition, processing and monitoring system
CO3	To design various signal conditioning systems for transducers
CO4	To analyze dynamic responses of various systems.
CO5	To get the concepts of virtual instrumentation
CO 6	To Understand the programming realization of PLC
	EE 474 Energy Management and Auditing
CO1	To enable the students to understand the concept of energy management and energy management opportunities
CO2	To understand the different methods used to control peak demand
CO3	To know energy auditing procedure
CO4	To understand the different methods used for the economic analysis of energy projects.
CO5	The students will be able to understand the different methods used to reduce energy consumption
	EE 302 Electromagnetics
CO1	Analyze fields and potentials due to static charges
CO2	Explain the physical meaning of the differential equations for electrostatic and magnetic fieldE
CO3	**Understand how materials are affected by electric and magnetic fields**
CO4	Understand the relation between the fields under time varying situations
CO5	Understand principles of propagation of uniform plane waves
CO6	Be aware of electromagnetic interference and compatibility
	EE 304 Advanced Control Theory
CO1	Students will be able to design compensators in time domain
CO2	Students will be able to design compensators in frequency domain
CO3	Students will be able to acquire the fundamental knowledge about state space modeling
CO4	Students will be able design controllers and observers and there by acquire full knowledge about the stability of systems
CO5	Students will be able to acquire knowledge about stability of nonlinear systems and will be able to analyze non linear systems
	EE 306 Power System Analysis
CO1	Students will be able to recall the concepts of per unit impedance diagram representation of three phase power system components in normal and abnormal conditions like fault using symmetrical components and Sequence networks.
CO2	Students will be able to compute symmetrical and unsymmetrical fault studies on the power system networks and design the ratings of the circuit breaker, current limiting reactors.
CO3	Students will be able to compute symmetrical and unsymmetrical fault studies on the power system networks and design the ratings of the circuit breaker, current limiting reactors.
CO4	Students will be able to perform modeling of single area and two area load frequency control and analyze the steady state and dynamic response of power system control.
CO5	Students can predict thoroughly the constraints involved in the load dispatch and compute optimal solution through unit commitment and Economic load dispatch including transmission losses.
CO6	Students will be able to assess the steady state and transient stability studies in the power system network using equal area criterion method and apply numerical solutions to swing equations.
	EE 308 Electric Drives
CO1	Students will be able to analyse a drive being applied in 4 different quadrants
CO2	Students will be able to apply drives being used in real applications
CO3	Students will be able to understand the various speed control techniques used in the control of the machine.
CO4	Students will be able to to understand the concept for DC drive
CO5	Students will be able to to understand the concept of speed control for AC drives
	EE Biomedical Instrumentation
CO1	To study about various biometrics and instruments
CO2	To understand the different types of bioelectric potentials
CO3	To learn the different measuring techniques and recording methods
CO4	To study about various computed, imaging, ultrasonic measuring methods
CO5	To familiarize different testing methods
	EE 202 Synchronous and Induction Machines
CO1	Students will be able to differentiate the different types of Synchronous machines and types of AC armature windings.
CO2	Students will be able to demonstrate knowledge on importance of Voltage regulation of Alternators and how to pre-determine the voltage regulation of Synchronous machines in laboratory.
CO3	Students will be able to acquire knowledge on how Alternators can be paralleled to Infinite bus and how loads can be shared.
CO4	Students will be able to understand all about Synchronous Motors and applications of various starting methods. Students will be able to differentiate the different types of Induction machines
CO5	Ability to analyse the performance of induction machines inorder to implement in household and industrial applications.
CO6	Will acquire knowledge on performance characteristics of synchronous induction motors relating the features of synchronous machines and induction machines. Ability to differentiate different types of single phase Induction motors
	EE 204 Digital Electronics and Logic Design
CO1	Students will be able to distinguish the different number systems and be able to convert from one form to other.
CO2	Students will be able to use the laws of Boolean algebra to simplify circuits.
CO3	Students will be able to design combinational and sequential circuits.
CO4	Students will be able to define the significance of state machines.
CO5	Students will be able to interpret programmable logic circuit devices and it's usage.
CO6	Students will be able to implement combinational circuits using VHDL.
	EE 206 Material Science
CO1	Describe the characteristics of conducting and semiconducting materials
CO2	Classify magnetic materials and describe different laws related to them
CO3	Classify and describe different insulators and to explain the behaviour of dielectrics instatic and alternating fields
CO4	Describe the mechanisms of breakdown in solids, liquids and gases
CO5	Classify and describe Solar energy materials and superconducting materials
CO6	Gain knowledge in the modern techniques for material studies
	EE 208 Measurements and Instrumentation
CO1	Students will be able to compare different types ofinstruments, their working principles advantages and disadvantages
CO2	Students will be able to explain the operating principles of various ammeters, voltmeters and ohm meters
CO3	**Students will be able to measure single phase & three phase power usingwattmeters**
CO4	Students will be able to summarize different flux and permeability measurements methods
CO5	Students will be able to differentiateAC potentiometers and bridges
CO6	Students will be able to explainthe working and applications of cathode ray oscilloscope
	EST 130 Basics Of Electrical Engineering
CO1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits
CO2	Develop and solve models of magnetic circuits
CO3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
CO4	Describe working of a voltage amplifier
CO5	Outline the principle of an electronic instrumentation system
CO6	Explain the principle of radio and cellular communication

Dr. K Vijayakumar
Principal
Thejus Engineering College
Vellarakkad P.O., Erumapetty
Thrissur - 680 584

	EE 401 Electronic Communication
CO1	Understand the need of modulation in transferring a signal through either wireless or wired communication systems
CO2	Be able to use analog modulation techniques and receiver fundamentals in analog communication.
CO3	Understand the need and selection of high frequency transmission.
CO4	Able to understand baseband digital encoding & decoding techniques in the storage / transmis-sion of digital signal through wired channel
CO5	Understand the performance of communication systems in the presence of noise and in-terference
CO6	Understand the need of wireless communication in longer distance.

	EE 403 Distributed Generation and Smart Grids
CO1	Student should able to understand about AC Microgrid,DC Microgrid and smart grid.
CO2	Student should able to recall the various Distributed generations and their controls.
CO3	should should able to understand the application of automation in metering, home and building automation and electric vehicles.
CO4	Student understands the concept of demand side management and energy management.
CO5	Student understand the concept of Substation and feeder Automation.
CO6	Student should understand the various power quality issues and the cloud computing.

	EE 405 Electrical System Design
CO1	Know the basic Rules and Regulations of electrical system design
CO2	Design simple electrical systems and prepare the schematic diagram with all the specifications.
CO3	To make aware of the act and rules regulating the design of electrical systems in India
CO4	To familiarise lighting calculations and external lighting
CO5	To impart knowledge in the design of low voltage and medium voltage electrical installations
CO6	To give basic knowledge of design of distribution transformer substations,their installations and earthing design for transformer substations

	EE 407 Digital Signal Processing
CO1	Analyse Discrete Time systems with Discrete Fourier Transform
CO2	Design digital filters IIR and FIR filters
CO3	Analyse finite word length effects in signal processing
CO4	Design filters using Matlab FDA tool box
CO5	Understand Digital Signal Controllers and their Applications
CO6	

	EE 409 Electrical Machine Design
CO1	Identify the general design considerations of electrical machines.
CO2	Design armature and field system of DC machines.
CO3	Design core, yoke, windings and cooling systems of transformers.
CO4	Design stator and rotor of induction machines.
CO5	Design stator and rotor of synchronous machines.
CO6	Apply software tools in electrical machine design.

	EE Electric Hybrid Vehicles
CO1	Explain the basic concepts of Conventional, Electric, Hybrid EV and Autonomous Vehicles
CO2	Describe different configurations of electric and hybrid electric drive trains
CO3	Discuss the propulsion unit for electric and hybrid vehicles
CO4	Compare various energy storage and EV charging systems
CO5	Select drive systems and various communication protocols for EV

	EE 301 Power Generation, Transmission and Protection
CO1	Students will be able to acquire knowledge about the basic aspects in the area of power generation and power factor correction
CO2	Students will be able to learn about various transmission line constants (Resistance, Inductance and capacitance).
CO3	Students will be able to do the performance analysis of transmission lines
CO4	Students will be able to perform the mechanical designing of overhead lines and underground cables
CO5	Students will be able to write about the HVDC transmission and FACTS controllers.
CO6	Students will be able to list various circuit breakers and relays used in power system
CO7	Students will be able to summarize the protection schemes for generator, transformer, motor, feeder and transmission lines

	EE 303 Linear Control Systems
CO1	Students will be able to explain the various practices of modelling physical systems.
CO2	Students will be able to differentiate between various control system components and will be able to explain the time domain specifications.
CO3	Students will be able to develop basic knowledge in error and stability analysis.
CO4	Students will be able to compare and analyze the stability of the systems- thereby having a more realistic approach towards the design of control systems.
CO5	Students will be able to compare and analyze the stability of the systems- thereby having a more realistic approach towards the design of control systems.
CO6	Students will be able to classify and understand the various frequency domain analysis technique in control system.

	EE 305 Power Electronics
CO1	Choose appropriate power semiconductor device in converter circuits and develop their triggering circuits.
CO2	Analyze various types of power electronic converters and apply different switching techniques.
CO3	Select appropriate power converter for specific applications.
CO4	Interpret and use data sheets of power semiconductor devices for design.

	EE 307 Signals & Systems
CO1	Students will be able to Represent various signals and systems
CO2	Students will be able to Analyze the continuous time system with Laplace transform
CO3	Students will be able to Recall and Analyze signals using Fourier representation
CO4	Students will be able to Analyze the discrete time system using ZT
CO5	Students will be able to Analyze the DT systems with DFS
CO6	Students will be able to Acquire basic knowledge in nonlinear systems

	EE 309 Microprocessor and Embedded Systems
CO1	To give an understanding on the 8085 and It's programming
CO2	To program 8085 microprocessor for various basic applications
CO3	To give a detail study about architecture of 8051 microcontroller.
CO4	To develop basic understanding on programming and interfacing of real time application .
CO5	To give an understanding on the embedded system
CO6	To design an embedded system for various real time applications

	EE 367 New and Renewable Source of Energy
CO1	Students will be able to recognize and understand the world and Indian energy scenario and necessity of sustainable development utilising Renewable Energy recourses.
CO2	Students will be able to analyse and infer the potentials and design systems based on solar thermal systems
CO3	Students will be able to illustrate, design and implement solar electric systems
CO4	Students will be able to understand the fundamentals and interpret basic components of energy from the ocean
CO5	Students will be able to understand the fundamentals and interpret basic components of energy from the wind
CO6	Students will be able to understand the fundamentals and interpret basic components of energy from the biomass and emerging technologies

	EE 311 Electrical Drives & Control for automation
CO1	Students will be able to explain the principle of electrical machines and their applications
CO2	Students will be able to apply the principle of electrical drives & be able to understand the dynamics of electrical drive systems
CO3	Students will be able to select a drive for a particular application based on power rating & to select a drive based on mechanical characteristics for a particular drive application.
CO4	Students will be able to identify solid state drive for speed control of various special electrical machines.
CO5	Students will be able to design speed control of induction motor drives in an energy efficient manner using power electronics & be able to learn the control system for synchronous motor drives

	EE 201 Circuits and Networks
CO1	Students will be able towrite equations and solve any DC and AC circuits using Network Theorems
CO2	Students will be able touse graph theory in solving networks
CO3	Students will be able to explain the transient response of any circuitusing Laplace Transform
CO4	Students will be able to analyse the performance of two port networks using network parameters
CO5	Students will be able to combinenetworks using Foster & Cauer Form

	EE 203 Analog Electronic Circuits
CO1	Students will be able design biasing scheme for transistor circuits.
CO2	Students will be able to model BJT and FET amplifier circuits
CO3	Students should be able to choose a power amplifier with appropriate specifications for electronic circuit applications
CO4	Students will be able to design and analyze oscillator circuits using BJT
CO5	Students will be able to choose operational amplifier (OPAMP) for specific applications including waveform generation.
CO6	Students will be able to design and implement analog circuits using OPAMPs

	EE 205 DC Machines and Transformers
CO1	Students will be able to recall, write and recognize different types of DC machines and transformers.
CO2	Students will be able to explain the working of DC machines and transformers.
CO3	Students will be able to analyze, justify and compare the functioning of DC machines and transformers in different working conditions
CO4	Students will be able to combine different basic principles of electrical engineering to apply on a practical situation
CO5	Students will be able to identify and choose DC machines and transformers for different purposes and applications

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