Course Outcomes

	Year &	_		
Dant	Semest	Course	Course Norre	Course Outcomes
Dept	er	Code	Course Name	
				and Curl and finding scalar potential function of
EEE				irrrotational vector fields.
				CO2: Understanding the concents of Green's Theorem
				Stokes' Theorem and the Divergence Theorem and to
				evaluate line integrals, surface, integrals and flux integrals.
				CO3: Understand some basic techniques for solving linear
				partial differential equations and how to identify a partial
				differential equation in order to determine which $t_{achnique}(s)$ can best be applied to solve it
				CO4: Understand the methods to solve it.
				and wave equations.
		211	En sin serin a Mathematica III	CO5: To gain good knowledge in the application of Fourier
		211	Engineering Mathematics-III	
				CO1: Evaluate the forces in concurrent and conlanar force
				systems, using various principles and also under different
				conditions of equilibrium. Analyze the forces in various
				applications and apply the concepts of friction to some basic
				applications of Electrical engineering.
				CO2: Understand and apply principles of parallel force
				systems to find centroid and moment of inertia of different
				CO3: Apply the concepts of kinematics and kinetics to
				analyze force on particles under rectilinear.
				CO4: Distinguish between various mechanical properties
				like yield strength, ultimate strength etc., of a given
				material and also to determine various types of direct
				stresses. Analyze the effect of shear force & bending
				CO5: Determine the banding stresses in different beams of
			Engineering Mechanics &	various cross sections and to find torsional stresses in
		212	Strength of Materials	shafts.
				Discuss about coordinate systems, Analyze problems on
				coulomb's law, Electric Field Intensity Electric Flux
				Density, and Gauss law.
				Classify the properties of conductors and dielectrics
				Apply Poisson and Laplace equations to one dimensional
				solution. Analyze Biot Savart's Law, Magnetic Field
				Intensity, Magnetic Flux Density and Ampere's circuit law .
				Compute forces on different current elements. Determine
				inductance for solenoid ,torrid and coaxial cables
				Compare Maxwell's equation in different forms, Discuss
		213	Electromagnetics	wave propagation and Poynting theorem
				Solve network circuits by using basic theorems for ac&dc
				Calculate various parameters of two port networks

			Evaluate natural and forced response o RL, RC and RLC
			Analyze circuits under resonant condition
	214	Natwork Theory	Develop the networks using LC, RC, RL by cauer and foster forms, Apply laplace transforms for electrical circuits
	214	Network Theory	
			CO1: Design simple electronic circuits to accomplish a specific function.
			CO2: Understand the voltage regulation.
			CO3: Understand the working of transistors. CO4: Design and analyze the basic amplifier circuits with proper bias stabilization.
	215	Electronic Devices & Circuits	CO5: Choose an appropriate device for given applications and use it satisfactorily.
			Conversion of number systems, and Demonstrate the
			theorems of boolean algebra
			Application K-Map and tabulation method for logical circuits
			Analyze synchronous sequential circuits and Design of registers and counters using gates and flipflops
			Classify various types of sequential logic circuits and Design of synchronous and asynchronous sequential logic circuits
	216	Digital Logic Design	Differentiate programmable of logic devices and Design of programmable of logic devices
			CO1: Can Understand and verify the network theorems.
			CO2: Understood the Series & Parallel resonance,
			importance of quality factor.
			network.
	217	Networks lab	
			Understand the use of RPS and CRT.
			applications.
			Set up a bias point in a transistor
		ELECTRONIC DEVICES	Design simple hardware circuits using diodes and transistors.
21	218	& CIRCUITS LAB	Design simple DC power supply circuits.
			transforms and apply the concepts of Z- Transform in
			Digital Systems.
			CO2: Familiarize the formation of Difference Equations and method of solving difference equations.
			CO3: Understand, interpret and use the basic concepts:
			analytic function, harmonic function, Taylor and Laurent series, singularity.
			CO4: Study the concepts of Residues, evaluating definite
			integrals using technique of residues and understand the concepts of conformal mappings.
			CO5: Analyze the Statistical data by using statistical tests (based on small sample and large sample) and to draw valid
	221	Engineering mathematics-IV	interences based on the analysis of statistical data.

		Determine the shunts and multipliers required to extend the range of instruments.
		Identify and compensate the errors while measuring power and energy by using measuring instruments.
		Analyze the behavior of the bridges when any changes are occurred in the arms of the bridges while measuring R,L,C and frequency.
		Analyze the behavior of magnetic materials by using different meters.
		Apply the concepts of potentiometers to construct voltmeter, ammeter, wattmeter, frequency, phase and amplitude
222	Electrical measurements	meters.
		Analyze the construction and operation of various DC Machines
		Analyze the various starting and testing methods of DC motors
		Analyze different speed control techniques of DC Motors
		Evaluate the equivalent circuit parameters of single phase transformer
223	Performance of Electrical Machines-I	Distinguish the performance of different three phase transformer connections
		CO1: Perform the analysis of small signal and low frequency hybrid model circuits.
		CO2: Determine various parameters of an amplifier like
		bandwidth.
		CO3: Know about various distortions that occur in amplifiers.
		CO4: To apply the concepts of feedback analysis to the design of amplifiers to meet or exceed stated specifications.
224	Analog Electronic Circuits	CO5: To design and analyze tuned amplifiers and oscillators to meet or exceed stated specifications.
		signals and systems.
		CO2: Analyze CT and DT systems in Time domain using convolution.
		CO3: Represent CT and DT systems in the Frequency
		domain using Fourier Analysis tools like CTFS, CTFT, DTFS and DTFT
		CO4: Conceptualize the effects of sampling a CT signal.
225	Signals & Systems	CO5: Analyze CT and DT systems using Laplace transforms and Z Transforms.
		Explain the architecture and pin configuration of 8085
		Classify memories and interfacing memory to CPU
		Discuss various interfacing devices with 8085
		Applications of microcontroller 8051 ADC and DAC. led's.
	Microprocessors and Micro	push button, relay's ,keyboard interfacing, interfacing seven
226	Controllers	segment display.
1		

			Understand the operational features of various measuring devices
			Understand and design bridges for the measurement of R, L & C
			Understand the operation of AC potentiometers and their
			applications.
-	227	Electrical measurements lab	
 -			CO1: Acquire a basic knowledge in solid state electronics
			including voltage transistor, power transistors and operational amplifier.
			CO2: Design analog electronic circuits using discrete components.
			CO3: Observe the amplitude and frequency responses of
			theoretical analysis.
			CO4: Measure various parameters of analog circuits and
			CO5: Design and construct simple electronic circuits to
22	228	ANALOG ELECTRONIC CIRCUITS LAB	accomplish a specific function, e.g., designing amplifiers, oscillators.
 -			Understand the concepts of arrays, recursion and structures
			Understand and apply various data structure such as Linked lists, Stacks, Queues,
			Tress and Graphs.
			Implement linked data structure to solve various problems.
-	312	Data Structures	Implement algorithms and how to apply customary algorithms for searching and sorting.
-			Determine the response of linear circuits for different input
			signals.
			Design application based nonlinear circuits.
			Understand the operation & application of Miller, Bootstrap circuit and calculate errors present in sweep signals.
-	313	Pulse and Digital Circuits	Realize logic gates belonging to different logic families such as TTL, CMOS.
 ŀ			Understand the DC and AC ehereotenistics of an anti-un-
			amplifiers and its effect on output and their compensation techniques.
			Design and analyze linear and non-linear applications of an opamp and special application ICs.
			Understand concept of PLL and demonstrate different applications based on it.
			Differentiate D/A and A/D convertor, understand their types and analyze their applications.
	314	Linear IC's and Applications	Demonstrate the applications of waveform generators, timers and Voltage regulators
 ľ			Build the knowledge of generation of electricity based on
			conventional energy resources.

			Identify the power system components for specified power
			generating application.
			of generating units
			Determineinterior and exterior lighting systems and
			illumination levels for different purposes and
			Recognizedifferent process of utilizing electric energy for
		Electrical Power Generation	heating and welding for industrial purposes.
	315	& Utilization	
			Apply signal flow graph and block diagram reduction techniques to Linear time invariant systems.
			Develop mathematical modeling of mechanical and electrical systems.
			Analyze the performance of 1 st and 2 nd order systems with and without feedback control
			Calculate the time domain system stability using Routh-
			Hurwitz criterion and root locus technique.
			Calculate the frequency domain system stability using bode
	316	Linear Control Systems	plots, polar plots and Nyquist plots technique.
			Develop the combinational and sequential circuits.
			Analyze and build the Programming of 8085
			microprocessor.
			interface with the peripherals.
		Digital Electronics &	Design the Programming of 8086 microprocessor
	317	Microprocessors Lab	
			Design the circuits using op-amps for various applications like adder, subtractor, integrator, differentiator and Schmitt trigger
			Design active filters for the given specifications and obtain their frequency response characteristics.
			Design and analyze multi vibrator circuits using op-amp, Transistor and 555Timer
		Linear Integrated Circuits &	Design application based on linear and nonlinear circuits
	318	Pulse and Digital Circuits Lab	Understand the operation & application of Bootstrap circuit
			Develop the mathematical model for any electrical and
			mechanical systems.
			Develop the state model and identify its stability of the
			given electrical and mechanical systems.
			Observe the effect of a controller to improve the time
			Design a componenter to improve the rest area
	201	Protessional Elective-	Design a compensator to improve the response.
	321		
			Understand the physical significance of laws of
			Apply thermodynamic principles to analyze the performance
			of IC engines. Comprehend the fundamentals of fluid mechanics and
			properties of fluids.
		Thermo Dynamics and	Apply Bernoulli's equation and impulse momentum equation to practical applications.

	Mechanics of Fluids	Distinguish different classes of hydraulic turbines and
322	(TD&MF)	analyze their performance.
		Apply the basic knowledge of the design of digital logic circuits computer organization
		Acquire the knowledge on instruction codes and instruction
		cycle.
		Understand the Micro Programming Control and detail
		understanding of CPU.
323	Computer Architecture and Organization (CAO)	Learn and apply input and output organization.
020		
		Explain the performance of three phase induction motor
		Classifiy the single phase induction motor.
		using circle diagram.
	Performance of Induction	Predict the regulation by different methods and analyse parallel operation of alternators.
324	and Synchronous Machines (PISM)	Construct V and inverted V curves, excitation circles and power circles of Synchronous motors.
		Explain the working principle of SCR, Demonstration of Static and Dynamic Characteristics and Classify various turn on methods.
		Analyze the Commutation and triggering circuits and also operational aspects of series and parallel thyristors.
		Analyze the operation and wave forms of phase controlled rectifiers
		Classify various types of inverters and Analyze the operation of inverters.
325	Power Electronics (PE)	Analyze operational aspects of various choppers, Cycloconverter and examine the modern semi conductor devices.
		Compare various supply systems and determine the most economical size of the conductor.
		Estimate the minimum voltage drop of distributors with concentrated loads.
		Determine the inductance and capacitance of solid, stranded and bundled conductors. Analyze the performance of short, medium and long transmission lines in terms of regulation and efficiency.
326	Power Transmission and	Calculate the sag and tension of transmission tower supports at equal and unequal levels and Determine the capacitance of single core and three core belted cables and find the power loss due to corona.determine the string efficiency of suspended type insulators.
		Have knowledge of various parts of a D.C electrical machines
		Conduct experiments on different types of D.C machines and find the characteristics.
		Conduct experiments on Transformers and find the characteristics.
		Apply mathematical and technical concepts required to
	Electrical Machines	engineering problems.
	Laboratory- I (EM Lab-I)	

		327		
				Calibrate pressure gauge and flow measuring devices such
				as venturimeter and orificemeter.
				Determine the properties of fuels and lubricating oils.
				Determine the force everted by jet on yone and compare
				with theoretical values.
				Analyze the performance of IC engines and turbo-
	32		TD&MF Laboratory	machinery.
		328		
EEE				
				Classify the electrical drives, explain the four quadrant
				operation in detail
				Analyse and modify the speed torque characteristics of
				3-phase Induction Motors, DC Motors & synchonous
				motors
				Analyse the starting of 3-phase induction Motors, DC
				Motors & synchonous motors in detail
				Motors & synchonous motors in detail
				Determine the specific energy consumption for a
		412	Professional Elective-II(EDT)	pirticular run and Explain the factors effecting it
				Discuss the basic elements in discrete control system
				Apply z-transform techniques to obtain discrete signal from
				time signal
				Analysis of discrete control system using transform
				techniques
				Analyze discrete time systems using signal flow graph and
		410		state space analysis
		412	Professional Elective-II(DCS)	Determine the stability of sampled data signals
				Understand the history and general concent of vehicle
				drive requirement and performance.
				Understand the concept and different configurations of
				Electric Hybrid Trains.
				Understand the idea of only Electric Drive Trains along
				with different Electric component commonly used in EHV
				and EV.
				Understand the different possible ways of energy storage
				FHV
				Understand the concept of energy management structure
		413	Professional Elective-III(EHV)	and strategies used in EHV or EV
				Discuss HVDC transmission over conventional AC
				transmission.
				Analyze HVDC power converters and their
				commutation process.
				Solve mathematical problems related to rectifier and
				inverter control methods and explain about different
				control schemes.
				Analyze the different harmonics generated by the
				converters and to differentiate the faults happening on
				both AC and DC sides.
		412	D O I I I I I I I I I I	Classify different FACTS devices and discuss their
		413	Professional Elective-III(HVDC)	operation and applications.

		Develop reactance diagram for a given single line
		diagram using per unit system.
		Apply Gauss-Seidel, Newton-Raphson and Fast
		Decoupled methods to solve power flow problem.
		Analyze symmetrical and unsymmetrical faults in
		nower systems
		Determine steady state stability limit and analyze
		transient stability on single machine connected to
		infinite hug system
		infinite bus system.
414	Power System Analysis	
		Explain the operation of single phase and three phase
		controlled rectifiers connected to various DC motors
		and Determine the values of output voltage, speed and
		and Determine the values of output voltage, speed and
		control a given D.C drive.
		Classify various types of braking techniques and
		Explain the four quadrant operation fed Dual
		converter. Determine the values of output voltage,
		speed and torque in motoring and braking modes.
		Classify various types of Choppers fed D.C motors and
		Analyze the operation and speed -torque
		characteristics. Simplify the Speed-torque expressions.
		Classify various methods of speed control of induction
		motors using A.C Voltage controller, Cycloconverter,
		VSI and CSI. Analyze the operation and speed -torque
		characteristics.
		Analyze the operation and speed -torque
		characteristics of Separate control & self control of
		synchronous motors using VSI, CSI and
		Cycloconverter. Examine the possible combinations of
415	Power Semiconductor Drives	converter fed motors.
		Compare the construction, operation and applications
		of electromagnetic relays and Over Current protection.
		Determine the settings of PSM and TMS of Over
		Current relay.
		Explain the construction, operation and applications of
		Distance and Differential Protection. Determine the
		minimum value of earthing resistance and percentage
		of winding unprotected for Alternators. Determine
		relay setting and CT ratio of transformer protected by
		percentage differential protection.
		Explain operation of Static Over current, Distance,
		Differential protection and Microprocessor based relay.
		Explain the construction, operation and applications of
		various types of Lightning arresters. Determine
		reflected, refracted voltages and currents of Travelling
		waves.
		Explain the construction operation and application of
		various types of Fuses and Circuit Breakers Determine
		the TRV/RRV Construct substation layout and bus
<i>A</i> 16	Dower System Distortion	bar arrangement using single diagram
+10	i ower System Flotection	our unangement using bilgie unagram.
<u> </u>		Analyze the VI characteristics of SCR and Illustrate
		different turnoff and turn on methods.
1	1	

			Analyze the operation of 1-phase & 3-phase rectifier circuits &Sketch the output waveforms for different firing angles Analyze the operation of on 1-phase inverter circuits &Sketch the output waveforms for different Analyze the operation of on 1-phase cyclo-converter with different frequencies for different loads and Compare the output waveforms of 1-phase AC voltage controller circuits for different firing angles for
			different loads
	417	Power Electronics Laboratory	chopper circuits &Sketch the output waveforms
			Analyze the Transformer for 3 phase to 2 phase or 2 phase to 3 phase conversion and separate the core losses.
			Analyze the speed control and performance characteristics of 3 phase Induction machine
			Analyze the voltage regulation and performance characteristics of 3 phase synchronous machine
	418	Electrical Machines Laboratory-II	
			Understand the concents of Economics
			Gain basis understanding of management and to relate
			the concents of management with industrial
			organizations and manage organizations efficiently
			Have the basic knowledge of production management
			and make decisions proficiently
		Engineering	Understand the basic concepts of accounting, finance
		Economics & Mgmt	and marketing management
	421		
			Solve Economic Dispatch, Unit Commitment, Hydro- Thermal scheduling and Optimal Power Flow problems using Lagrange multiplier method.
			control mechanism.
			Analyze Automatic Voltage Regulator control mechanism and Compare various excitation systems
			Identify different levels of the EMS and State their
			tunctions. Describe Operating States of Power System.
			Distribution systems Lighting systems Compressed
		Energy Management	Air system. Air Condition and Ventilation system.
	423	& Control	
			Write Matlab programs for Y-bus and String
			Analyze the performance of Transmission lines,
			Transient stability and Economic distich using Matlab
			Analyze and Simulate Symmetrical Unsymmetrical
			faults and Load flow methods for a given power system
			network using ETAP software.
			Analyze and Simulate Single area and two-area load
			frequency mechanism using Matlab software.

	424	Power System Simulation Lab	
			Determine the transfer functions of DC and AC servomotor
			To analyze the performance of synchro pair, BLDC motor, DC
			position control system and Magnetic amplifier
			To analyze the response of 1^{st} , 2^{nd} and 3^{rd} order systems with and without feedback
			Design of compensators using Bode plot techniques
		Control Systems Laboratory	Estimate the effect of Temperature controlled system using conventional controllers
42	425		