VASIREDDY VENKATADRI INSTITU

DEPARTMENT OF ELECTRICAL AND EL

R16 CO-PO MA

I B.TECH I SI

R161101	ENGLISH-I	CO1	identify the context, topic, and pieces of specific information from sc
		CO2	formulate sentences using proper grammatical structures and correc
		CO3	speak clearly on a specific topic using suitable discourse markers in i
		CO4	write summaries based on global comprehension of reading/listenin
		CO5	produce a coherent paragraph interpreting a figure/graph/chart/tab

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	-	-	-	-
CO5	-	-	-	-	-	-
Target						

R161102	MATHEMATICS-I	CO1	Understand the first order ordinary Differential equations and analys
		CO2	Classify and solve thehigher order ordinary differential equations an
		CO3	ApplyLaplace transformations and Evaluatethe improper integral
		CO4	Remember partialdifferentiationandCompute extreme values.
		CO5	Construct the Partial differential equations and Solve first order part
		CO6	Classify the nature of higher order partial differential equations

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	-	-	-	-
CO2	3	2	-	-	-	-
CO3	3	2	-	-	-	-
CO4	3	2	-	-	-	-
CO5	3	2	-	-	-	-
CO6	3	2	-	-	-	-
Target	3	2				

R161106	Applied Chemistry	CO1	Able to explain about synthesis, physical and mechanical properties,
		CO2	Recognize specific characteristic properties of fuels including calorifi
		CO3	Understanding the principles,Construction and working of galvanic c
		CO4	Discovery of advanced materials i.e.nanomaterials,liquidcrystals,sup
		CO5	Understanding the structures of solid crystalline structures, synthes
		CO6	Recognizenon-conventional energy sources, construction & working

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	-	-	-	-
CO2	3	3	-	-	-	-
CO3	2	2	-	-	-	-
CO4	3	2	-	-	-	-

		CO5	2	1	-	-	-	-
		CO6	2	2	-	-	-	-
		Target	2.33	2.17				

R161111	Engineering Mechanics	CO1	To understand the concepts of force and friction, direction and its ap					
		CO2	To understand the application of free body diagrams, solution to pro					
		CO3	To understand the concepts of centroid and Centre of gravity.					
		CO4	To understand the concepts of moment of inertia and polar moment					
		CO5	To understand the motion of a particle in straight line and in curvilin					
		CO6	To understand the concepts of work, energy and particle motion.					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	3	2	-	-	-	-
		CO2	3	2	1	-	-	-
		CO3	3	2	-	-	-	-
		CO4	3	2	1	-	-	-
		CO5	3	2	-	-	-	-
		CO6	3	2	1	-	-	-
		Target	3	2	1			

R161107	Computer Programming	CO1	Understanding basic jargon of Computer and formulating algorithmi					
		CO2	Understanding programming style in C					
		CO3	Understanding branching & iteration in Problem solving.					
		CO4	Build program blocks using Modular programming approach.					
		CO5	Implementation of data using Arrays & Strings					
		CO6	Comprehension of group data using structures and File Management					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	2	2	2	-	2	-
		CO2	1	1	1	-	2	-
		CO3	2	2	2	2	-	-
		CO4	1	2	3	3	-	-
		CO5	2	3	2	2	1	-
		CO6	2	3	3	3	-	-
		Target	1.67	2.17	2.17	2.5	1.67	

R161108	mental Studies	CO1	Able to Understand The concepts of the ecosystem					
		CO2	Able to Understand The natural resources and their importance					
		CO3	Able to learn The biodiversity of India and the threats to biodiversity					
		CO4	Able to learn Various attributes of the pollution and their impacts					
		CO5	Able to Understand Social issues both rural and urban environment					
		CO6	Able to Understand About environmental Impact assessment and Ev					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	-	-	-	-	-	-

	Environ							
		CO2	-	-	3	-	-	-
		CO3	-	-	-	-	-	-
		CO4	-	-	3	-	-	-
		CO5	-	-	3	-	-	-
		CO6	-	-	3	-	-	-
		Target			3			

	Applied / Engineering Chemistry Laboratory		
		CO1	Estimate the amount of metal ions present in different solutions (L5)
		CO2	Analyse the quality parameters of water (L4)
		CO3	Determine the strength of different solutions by using different instr

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	3	2	-	-	-
CO2	-	2	3	-	-	-
CO3	-	1	2	-	-	-
Target		2	2.33			

	English - Communication Skills Lab – 1		
		CO1	identify the context, topic, and pieces of specific information from so
		CO2	take notes while listening to a talk/lecture; to answer questions in En
		CO3	Write summaries based on global comprehension of reading/listenin

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
Target						

	Computer Programming Lab		
		CO1	Understand the basic terminology used in computer programming
		CO2	Write, compile and debug programs in C language.
		CO3	Use different data types in a computer program.
		CO4	Design programs involving decision structures, loops and functions.
		CO5	Understand the difference between call by value and call by referen
		CO6	Understand the dynamics of memory by the use of pointers
		CO7	Use different data structures and create/update basic data files.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	1	1	2	-
CO2	3	3	1	1	2	-
CO3	3	2	3	2	2	-
CO4	3	3	2	3	2	-
CO5	3	3	2	2	3	-
Co6	3	2	2	2	2	-
CO6	3	2	3	3	3	-
Target	3	2.29	2	2	2.29	

R161201	English –II	CO1	To read and comprehend English stories and texts
		CO2	To write effectively using appropriate format and transfer verbal info
		CO3	To improve listening skills particularly related to Technical English an
		CO4	To expand vocabulary range and use it effectively and grammatically
		CO5	To improve life skills and core skills necessary for effective communi

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	-	-	-	-
CO5	-	-	-	-	-	-
Target						

R161202	Mathematics-II (Mathematical Methods)	CO1	Appropriate Numerical methods to find roots of algebraic & transcer
		CO2	Understand the interpolation and extrapolation techniques
		CO3	Apply different numerical methods to Solve differential equations.
		CO4	Interpret Fourier series analysis which is central to many application
		CO5	Solving of Higher order Partial differential equations and their applic
		CO6	Apply Fourier transforms to Evaluate improper integrals

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	-	-	-	-
CO2	3	2	-	-	-	-
CO3	3	2	-	-	-	-
CO4	3	2	-	-	-	-
CO5	3	2	-	-	-	-
CO6	3	2	-	-	-	-
Target	3	2				

R161203	Mathematics-III	CO1	Solve the system of linear equations and Analyse their applications
		CO2	Compute an Eigen values and eigen vectors.
		CO3	Evaluate double and Triple integrals and Apply to find surface area a
		CO4	Compare definite integral with special functions
		CO5	Differentiate the scalar and vector functions.
		CO6	Understand line, surface and volume integrals and Establish vector ir

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	-	-	-	-
CO2	3	2	-	-	-	-
CO3	3	2	-	-	-	-
CO4	3	2	-	-	-	-
CO5	3	2	-	-	-	-

		CO6	3	2	-	-	-	-
		Target	3	2				

R161207	Applied Physics	CO1	Students acquire the abilityto applyknowledgeofInterference concep					
		CO2	Students acquire the abilityto applyknowledge of Diffraction concep					
		CO3	Students will be able to understand the applications of Lasers.					
		CO4	Knowledge of EMW avepropagation and its applications will be gaine					
		CO5	Studentswillbeabletodevelopscientificpointofviewinsolvingproblems					
		CO6	Students will be able to design and analyse Laws and principles of Se					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	3	2	-	-	-	-
		CO2	3	2	-	-	-	-
		CO3	3	2	-	-	-	-
		CO4	3	2	-	-	-	-
		CO5	3	2	-	-	-	-
		CO6	3	2	-	-	-	-
		Target	3	2				

R161208	Electrical Circuit Analysis - I	CO1	Able to solve Various electrical networks in presence of active and pa					
		CO2	Able to solve any R, L, C network with sinusoidal excitation.					
		CO3	Able to solve any R, L, C network with variation of any one of the par					
		CO4	Able to solve any magnetic circuit with various dot conventions.					
		CO5	Able to solve electrical networks with network topology concepts.					
		CO6	Able to solve electrical networks by using principles of network theo					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	3	2	2			
		CO2	3	2	1			
		CO3	2	2	2	1		
		CO4	3	2	2	1		1
		CO5	3	2	3	1		1
		CO6	3	2	1	1		

R161206	Engineering Drawing	CO1	To draw various Engineering curves & polygons.					
		CO2	To understand different scales used in the industry, to recognize prir					
		CO3	To interpret the projection principles to draw projections of straight					
		CO4	To understand the various ways to draw projections of planes.					
		CO5	To draw the projections of solids by applying principles of Orthograp					
		CO6	To convert isometric views into orthographic views and vice versa.					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	1	1	1	-	-	-
		CO2	2	2	2	-	-	-
		CO3	2	2	2	-	-	-

		CO4	2	2	2	-	-	-
		CO5	2	2	2	-	-	-
		CO6	3	3	3	-	-	-
		Target	2	2	2			

	English - Communication Skills Lab – 2	CO1	prioritize information from reading texts after selecting relevant and					
		CO2	make formal structured presentations on academic topics using PPT					
		CO3	participate in group discussions using appropriate conventions and la					
		CO4	prepare a CV with a cover letter to seek internship/ job (L2)					
		CO5	collaborate with a partner to make presentations and Project Report					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	-	-	-	-	-	-
		CO2	-	-	-	-	-	-
		CO3	-	-	-	-	-	-
		CO4	-	-	-	-	-	-
		CO5	-	-	-	-	-	-
		Target						

	Applied / Engineering Physics Lab	CO1	Students Acquire ability to apply knowledge of Interference concept					
		CO2	Students Acquire ability to apply knowledge of Interference concept					
		CO3	Students will be able to understand the applications of Lasers					
		CO4	Knowledge of Acoustics of buildings and NDT applications will be gai					
		CO5	Students will be able to understand the material properties and nucl					
		CO6	Students will acquire sufficient knowledge of the various application					
			PO1	PO2	PO3	PO4	PO5	PO6
		CO1	3	3	3	2	2	-
		CO2	2	2	2	3	2	-
		CO3	3	2	2	2	3	-
		CO4	2	2	3	3	3	-
		CO5	3	2	3	2	2	-
		CO6	3	3	2	2	1	-
		Target	2.67	2.33	2.5	2.33	2.17	

	KSHOP & IT WORKSHOP	CO1	To select suitable carpentry tools to prepare different types of joints					
		CO2	To identify tools required in the fitting operation to perform joint pre					
		CO3	To understand the process of making different objects with thin shee					
		CO4	To differentiate single phase, 3 phase wiring connections.					
		CO5	Identify the basic computer peripheral and gain sufficient knowledge					
		CO6	Learn the installation procedure of Windows and Linux OS,					
		CO7	Acquire knowledge on basic networking infrastructure and acquire k					
		CO8	Learn productivity tools like Word, Excel and Power point.					
			PO1	PO2	PO3	PO4	PO5	PO6

	ENGINEERING WOR	CO1	2	-	1	-	-	1
		CO2	2	1	-	-	-	1
		CO3	2	1	-	-	-	1
		CO4	1		-	-	-	1
		CO5	2	1	-	-	2	-
		CO6	2	2	-	2	2	-
		CO7	1	1	1	1	2	-
		CO8	1	2	-	-	2	-

II Year – I Sem

R1621021	Electrical Circuit Analysis - II	CO1	Students are able to solve three- phase circuits under balanced cond
		CO2	Students are able to solve three- phase circuits under unbalanced co
		CO3	Students are able find out transient response of electrical networks
		CO4	Students are able to estimate the different types of two port networ
		CO5	Students are able to represent electrical equivalent network for a giv
		CO6	Students are able to extract different harmonics components from t

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	-	-	-	-
CO2	2	2	-	-	-	-
CO3	1	2	-	-	-	-
CO4	2	2	-	-	-	-
CO5	2	2	-	-	-	-
CO6	2	1	-	-	-	-

R1621022	Electrical Machines-I	CO1	Able to assimilate the concepts of electromechanical energy convers
		CO2	Able to mitigate the ill-effects of armature reaction and improve con
		CO3	Able to understand the torque production mechanism and control th
		CO4	Able to analyze the performance of single phase transformers.
		CO5	Able to predetermine regulation, losses and efficiency of single phas
		CO6	Able to parallel transformers, control voltages with tap changing me

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	1	2	-	-
CO2	3	2	3	2	-	-
CO3	3	2	2	2	-	-
CO4	3	2	3	3	-	-
CO5	2	2	2	3	-	-
CO6	2	3	3	1	-	-

		CO1	To Determine electric fields and potentialsusing guass's lawor solvin
		CO2	To Calculate and design capacitance, energy stored in dielectrics.

R1621024 — **Electro Magnetic Fields**

CO3	To Calculate the magnetic field intensity due to current, the applicat
CO4	To determine the magnetic forces and torque produced by currents
CO5	To determine self and mutual inductances and the energy stored in t
CO6	To calculate induced e.m.f., understand the concepts of displacemer

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	3	0	-	0
CO2	3	2	2	2	-	1
CO3	3	2	3	2	-	1
CO4	2	2	2	2	1	1
CO5	3	2	1	1	-	0
CO6	2	2	1	1	-	0

R1621025 — **Thermal and Hydro Prime Movers**

CO1	Classify the heat engines , understand the working principles of IC er
CO2	Discuss about the properties of steam, analysis of ranking cycle and
CO3	Understand and analysis of Gas turbines
CO4	Identify the significance of impulse momentum equation, understan
CO5	Classify , working & design principles of hydraulic turbine including it
CO6	Understand about hydro-electric power plant and calculation of diffe

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	1	0	0	0
CO2	2	2	3	3	2	0
CO3	3	0	0	3	3	0
CO4	2	2	2	2	3	0
CO5	3	2	2	2	1	0
CO6	3	2	2	3	2	1

R1621026 — **Managerial Economics & Financial Analysis**

CO1	Understanding basics of Managerial Economics and concepts of dem
CO2	Remembering the concepts of production & cost and applying break
CO3	Analyzing different market structures to determine pricing.
CO4	Evaluating different forms of business organization.
CO5	Applying accounting principles to know the financial position of the b
CO6	Create awareness about capital budgeting method to determine pro

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	2	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	-	-	-	3
CO5	-	-	2	2	-	-
CO6	-	-	-	2	2	-

	Electrical Circuits Laboratory	CO1	Able to experimentally verify the basic circuit theorems.
		CO2	Able to draw the locus diagrams, waveforms and phasor diagrams fo
		CO3	Able to determine the two port parameters of a given electric circuit
		CO4	To measure power and power factor in 3- phase circuit for unbalanc
		CO5	Able to know the resonance condition of a given network.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	2		2
CO2	2	1	1	1		2
CO3	2	2	1	1		1
CO4	2	2	2	1		2
CO5	2	1	2	1		1

II Year – II Sem

R1622021	Electrical Measurements	CO1	Able to choose right type of instrument for measurement of voltage
		CO2	Able to choose right type of instrument for measurement of power a
		CO3	Able to calibrate ammeter and potentiometer.
		CO4	Able to select suitable bridge for measurement of electrical paramet
		CO5	Able to use the ballistic galvanometer and flux meter for magnetic m
		CO6	Able to measure frequency and phase difference between signals us

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2				1	
CO2	2	1	1		1	
CO3	1					
CO4	3	2				
CO5	2					
CO6	2	1	1		1	

R1622022	Electrical Machines-II	CO1	Able to explain the operation and performance of three phase induc
		CO2	Able to analyze the torque-speed relation, performance of induction
		CO3	Able to explain design procedure for transformers and three phase i
		CO4	Implement the starting of single phase induction motors.
		CO5	To perform winding design and predetermine the regulation of synch
		CO6	Avoid hunting phenomenon, implement methods of staring and corr

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2			1	
CO2	2	3			1	
CO3	3	1			1	
CO4	2	3				
CO5	2	2				
CO6	2	1			1	

R1622023 — **Switching Theory and Logic Design**

CO1	To Understand the different number systems, binary arithmetic oper
CO2	To Apply di R1622023
CO3	To Evaluate the combinational logic circuits: Decoder, Encoder, Mult
CO4	To Memorize the combinational circuit design procedure and Apply t
CO5	To Analyze an element, different latches, flip-flops, registers and Des
CO6	To Analyze an element, different latches, flip-flops, registers and Des

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	2	-	-	-	-
CO2	-	-	2	-	-	-
CO3	-	-	3	-	-	-
CO4	-	3	-	-	-	-
CO5	-	-	-	3	-	-
CO6	-	-	-	3	-	-

R1622024 — **Control Systems**

CO1	Ability to derive the transfer function of physical systems and determ
CO2	Capability to determine time response specifications of second order
CO3	Acquires the skill to analyze absolute and relative stability of LTI syst
CO4	Capable to analyze the stability of LTI systems using frequency respo
CO5	Able to design Lag, Lead, Lag-Lead compensators to improve system
CO6	Ability to represent physical systems as state models and determine

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	3	0	-	0
CO2	3	2	2	2	-	1
CO3	3	2	3	2	-	1
CO4	2	2	2	2	1	1
CO5	3	2	1	1	-	0
CO6	2	2	1	1	-	0

R1622025 — **Power Systems-I**

CO1	Students are able to identify the different components of thermal po
CO2	Students are able to identify the different components of nuclear Po
CO3	Students are able to distinguish between AC/DC distribution systems
CO4	Students are able to identifythe different components of air and gas
CO5	Students are able to identifysingle core and multi core cables with di
CO6	Students are able to analyzethe different economic factors of power

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2				
CO2	2	2				
CO3	3	3	1			
CO4	2	2		1		
CO5	3	1				

		C06	2	2	1		1	

R1622026	Management Science	CO1	Understanding basics of management and organization.
		CO2	Remembering principles of management and applying the concepts
		CO3	Analyze the functions of HRM and marketing.
		CO4	Applying PERT & CPM techniques to solve project management prob
		CO5	Evaluating SWOT Analysis for formulating and implementing strategi
		CO6	Creating awareness about modern or contemporary management pr

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	-	-	-	-
CO2	-	-	-	-	-	-
CO3	-	-	-	-	-	-
CO4	-	-	2	-	-	-
CO5	-	-	-	-	-	-
CO6	-	-	-	-	2	-

	Electrical Machines -I Laboratory	CO1	To determine and predetermine the performance of DC machines.
		CO2	To control the speed of DC motor.
		CO3	To determine and predetermine the performance of Transformer.
		CO4	To achieve three phase to two phase transformation.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	1	1	1	
CO2	2	2	1	1	1	
CO3	2	2	1	1	1	
CO4	2	2	1	1	1	

	Electronic Devices & Circuits Laboratory	CO1	Able To understand the characteristics of PN Junction and Zenor dio
		CO2	Able To draw the characteristics of BJT, FET, SCR and UJT
		CO3	Able To Analyze the applications of PN Junction as Rectifier
		CO4	Able To analyze the operation of BJT and FET as a amplifier
		CO5	Able To understand the operation of CRO

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	1	1	
CO2	2	1	1	1	1	
CO3	2	1	1	1	1	
CO4	2	1	1	1	1	
CO5	2	1	1	1	1	

III Year – I Sem

		CO1	Able to understand parameters of various types of transmission lines

R1631021	Power Systems-II	CO2	Able to understand the performance of short and medium transmiss
		CO3	Able to understand the performance of Long transmission lines.
		CO4	Student will be able to understand travelling waves on transmission
		CO5	Will be able to understand various factors related to charged transm
		CO6	Will be able to understand sag/tension of transmission lines and per

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	3			
CO2	3	3	1			
CO3	1	3	1			
CO4	1	1	0			
CO5	1	2	0			
CO6	3	3	3			

R1631022	Renewable Energy Sources	CO1	Analyze solar radiation data, extraterrestrial radiation, and radiation
		CO2	Design solar thermal collectors, solar thermal plants.
		CO3	Design solar photo voltaic systems.
		CO4	Develop maximum power point techniques in solar PV and wind ene
		CO5	Explain wind energy conversion systems, wind generators, power ge
		CO6	Explain basic principle and working of hydro, tidal, biomass, fuel cell

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3				
CO2	1	2				
CO3	1	2				
CO4	2	2				
CO5	3	2				
CO6	3	3				

R1631023	Signals and Systems	CO1	Describe signals mathematically and understand how to perform diff
		CO2	Analyse the continuous-time signals and continuous-time systems us
		CO3	Apply sampling theorem to convert continuous-time signals to discre
		CO4	Classify systems based on their properties and determine the respor
		CO5	Compute Laplace transforms to analyze continuous time signals and
		CO6	Calculate z-transform to analyze discrete-time signals and systems, a

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	-	-	-	-
CO2	3	-	2	-	-	-
CO3	-	-	3	-	-	-
CO4	3	-	3	-	-	-
CO5	-	2	-	-	-	-
CO6	-	2	-	-	-	-

R1631024	Pulse & Digital Circuits	CO1	Understand and Apply the concept of linear wave shaping circuits lik
		CO2	Analyze the nonlinear wave shaping circuits like clippers & clampers
		CO3	Examine the switching characteristics of nonlinear elements used in
		CO4	Create the different types of multivibrator circuits.
		CO5	Evaluate different types of voltage and current time base generators
		CO6	Illustrate the principles of synchronisation and frequency division an

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	3	-	-	-	-
CO2	1	3	-	-	-	-
CO3	1	2	3	-	-	-
CO4	1	2	3	-	-	-
CO5	-	-	-	-	-	-
CO6	-	2	-	-	-	-

R1631025	Power Electronics	CO1	Explain the characteristics of various power semiconductor devices a
		CO2	Design firing circuits for SCR.
		CO3	Explain the operation of single phase full–wave converters and analy
		CO4	Explain the operation of three phase full–wave converters.
		CO5	Analyze the operation of different types of DC-DC converters.
		CO6	Explain the operation of inverters and application of PWM technique

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1			1
CO2	2	2	2			1
CO3	3	2	3			1
CO4	2	2	2			1
CO5	3	2	2			1
CO6	2	2	1			1

	Electrical Machines-II Laboratory	CO1	Able to assess the performance of single phase and three phase indu
		CO2	Able to control the speed of three phase induction motor.
		CO3	Able to predetermine the regulation of three–phase alternator by va
		CO4	Able to find the Xd/ Xq ratio of alternator and asses the performance

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	1	1	1	
CO2	2	1	1	1	1	
CO3	2	1	1	1	1	
CO4	2	1	1	1	1	

Control Systems Laboratory

CO1	Able to analyze the performance and working Magnetic amplifier, D.
CO2	Able to design P, PI, PD and PID controllers and design lag, lead and l
CO3	Able to control the temperature using PID controller and determine
CO4	Able to control the position of D.C servo motor performance

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1	-	1	1	
CO2	2	1	1	1	1	
CO3	1	-	-	-	1	
CO4	1	1	1	1	1	

Electrical Measurements Laboratory

CO1	To be able to measure accurately the electrical parameters voltage,
CO2	To be able to measure illumination of electrical lamps.
CO3	To be able to test transformer oil for its effectiveness.
CO4	To be able to measure the parameters of inductive coil.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1				
CO2	1	1				
CO3	1	1				
CO4	1			1		

IPR & Patents

CO1	Understanding, defining and differentiating different types of intelle
CO2	Understanding the Framework of Strategic Management of Intellect
CO3	Identify different types of Intellectual Properties (IPs), the right of ov
CO4	Recognize the crucial role of IP in organizations of different industria
CO5	Identify activities and constitute IP infringements and the remedies a
CO6	Understanding, Identify various cybercrimes in online networks

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	2	3	2	2	2
CO2	-	2	3	1	2	2
CO3	-	1	2	-	3	3
CO4	1	3	3	2	2	2
CO5	-	-	3	-	2	-
CO6	-	2	2	-	-	2

III Year – II Ser

ers & Drives

CO1	Explain the fundamentals of electric drive and different electric brak
CO2	Analyze the operation of three phase converter fed dc motors and fc
CO3	Describe the converter control of dc motors in various quadrants of
CO4	Know the concept of speed control of induction motor by using AC v
CO5	Differentiate the stator side control and rotor side control of three p

R1632021	Power Electronic Controll	CO6	Explain the speed control mechanism of synchronous motors

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	3			
CO2	3	3	1			
CO3	1	3	1			
CO4	1	1	0			
CO5	1	2	0			
CO6	3	3	3			

R1632022	Power System Analysis	CO1	Able to draw impedance diagram for a power system network and to
		CO2	Able to form aYbusand Zbusfor a power system networks.
		CO3	Able to understand the load flow solution of a power system using d
		CO4	Able to find the fault currents for all types faults to provide data for t
		CO5	Able to findthe sequence components of currents for unbalanced po
		CO6	Able to analyze the steady state, transient and dynamic stability con

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	2			
CO2	2	2	1			
CO3	2	1	2			
CO4	2	2	1			
CO5	1	1	2			
CO6	2	1	2			

R1632023	Micro Processors and Micro controllers	CO1	Able to understand the microprocessor capability in general and exp
		CO2	Able to understand the addressing modes of microprocessors
		CO3	Able to understand the IO interfacing with 8086 MP.
		CO4	Able to understand the 8051 micro controller architecture.
		CO5	Able to understood the concepts of PIC18 family and its architecture
		CO6	Able to develop c programs for PIC18

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2					
CO2	2	1				
CO3	2	2	2			
CO4	2	2	2			
CO5	2					
CO6	2	1				

		CO1	Able to understandFundamentals of data structures and algorithms a
		CO2	Able to apply data structure strategies like arrays to implement stacl
		CO3	Able to demonstrate operations and applications of linked list and w
		CO4	Able to applydata structures into the applications such as binary tree

R1632024	Data Structures	CO5	Able to applydata structures into the applications such asgraphs.
		CO6	Able to compare and contrast various searching and sorting techniqu

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	2	2	1	-	-
CO2	3	3	2	1	-	-
CO3	3	3	2	2	-	-
CO4	2	3	2	2	-	-
CO5	2	3	2	2	-	-
CO6	2	3	2	2	-	-

R163202E	Neural Networks &Fuzzy Logic	CO1	To understand artificial neuron models.
		CO2	To understand learning methods of ANN.
		CO3	To utilize different algorithms of ANN.
		CO4	To distinguish between classical and fuzzy sets.
		CO5	To understand different modules of fuzzy controller.
		CO6	To understand applications of neural networks and fuzzy logic.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2				
CO2	3	2				
CO3	3	3				
CO4	3	2				
CO5	2	3				
CO6	2	3				

	Power Electronics Laboratory	CO1	Able to study the characteristics of various power electronic devices
		CO2	Able to analyze the performance of single phase and three phase ful
		CO3	Able to understand the operation of single phase AC voltage regulat
		CO4	Able to understand the working of Buck converter, Boost converter,

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	1				
CO2	2	1				
CO3	2	1				
CO4	1	1				

	rocessors & controllers boratory	CO1	Understand and apply the fundamentals of assembly level programn
		CO2	Design interfacing circuits with 8086
		CO3	Design and implement 8051 microcontroller based systems

	PO1	PO2	PO3	PO4	PO5	PO6

	Microp Microc Lal	CO1					1	
		CO2					1	
		CO3					1	

	Data Structures Laboratory	CO1	Implement linear and non-linear data structures using arrays and linl
		CO2	Understand and apply various data structure such as stacks, queues,
		CO3	Identify and use a suitable data structure and algorithm to solve a re
		CO4	Implement various kinds of searching and sorting techniques, and de

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	-	3	-	-	-
CO2	1	-	2	3	-	-
CO3	1	2	3	1	-	-
CO4	1	2	2	1	-	-

	Professional Ethics & Human Values	CO1	Able to introduce the basic philosophy of morals, values and ethics t
		CO2	Able to impart reasoning and analytical skills needed to apply ethical
		CO3	Able to identify the moral issues involved in both management and e
		CO4	Able to understand the unethical errors committed by the engineers
		CO5	Able to minimize the occupational crimes in the corporate sector by
		CO6	Able to Focus on intellectual property rights and ethical engineering.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	1	1	-
CO2	2	-	-	2	1	-
CO3	1	-	-	3	1	-
CO4	2	-	-	1	2	-
CO5	2	-	-	1	1	-
CO6	1	-	-	1	2	-

IV Year – I Sem

R1641021	Utilization of Electrical Energy	CO1	Able to identify a suitable motor for electric drives and industrial app
		CO2	Able to identify most appropriate heating or welding techniques for
		CO3	Able to understand various level of illuminosity produced by differer
		CO4	Able to estimate the illumination levels produced by various sources
		CO5	Able to determine the speed/time characteristics of different types c
		CO6	Able to estimate energy consumption levels at various modes of ope

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2				
CO2	2	2				
CO3	3	3	1			
CO4	2	2		1		

		CO5	3	1			
		CO6	2	2	1		1

R1641022	Linear IC Applications	CO1	Able to understand the performance parameters of differential ampl
		CO2	Able to understand & learn the measuring techniques of performanc
		CO3	Able to learn the linear and non-linear applications of operational an
		CO4	Able to understand the analysis & design of different types of active
		CO5	Able to learn the internal structure, operation and applications of PL
		CO6	Able to Understand the conversion circuits ADC and DAC IC's.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	-	-	2	-
CO2	3	2	-	-	2	-
CO3	3	2	3	2	2	-
CO4	2	3	2	2	2	-
CO5	2	-	-	2	-	-
CO6	2	-	-	1	2	

R1641023	Power System Operation & Control	CO1	Able to compute optimal scheduling of Generators.
		CO2	Able to understand hydrothermal scheduling.
		CO3	Understand the unit commitment problem.
		CO4	Able to understand importance of the frequency.
		CO5	Understand importance of PID controllers in single area and two are
		CO6	Will understand reactive power control and compensation for transr

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	1	1	-	-
CO2	3	2	1	1	-	-
CO3	2	1	-	-	-	-
CO4	2	1	-	-	-	-
CO5	2	2	-	-	-	-
CO6	3	2	-	-	-	-

R1641024	tchgear and Protection	CO1	Able to understand the principles of arc interruption for application t
		CO2	Ability to understand the working principle and operation of differer
		CO3	Students acquire knowledge of faults and protective schemes for hig
		CO4	Improves the ability to understand various types of protective schem
		CO5	Able to understand different types of static relays and their applicati
		CO6	Able to understand different types of over voltages and protective sc

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	2	2	1
CO2	3	3	3	3	1	1

	Swi	CO3	3	2	2	2	2	2
		CO4	2	2	2	3	2	1
		CO5	3	2	3	2	-	1
		CO6	2	2	3	2	2	2

R164102D	Instrumentation	CO1	Able to represent various types of signals .
		CO2	Acquire proper knowledge to use various types of Transducers.
		CO3	Able to monitor and measure various parameters such as strain, velc
		CO4	Acquire proper knowledge and working principle of various types of
		CO5	Able to measure various parameter like phase and frequency of a sig
		CO6	Acquire proper knowledge and able to handle various types of signal

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	2	2	1
CO2	3	3	3	3	1	1
CO3	3	2	2	2	2	2
CO4	2	2	2	3	2	1
CO5	3	2	3	2	-	1
CO6	2	2	3	2	2	2

R16412026	Special Electrical Machines	CO1	Understand the concepts of Permanent magnet materials and PMDC
		CO2	Distinguish between brush dc motor and brush less dc motor.
		CO3	Explain the performance and control of stepper motors, and their ap
		CO4	Explain theory of operation and control of switched reluctance moto
		CO5	Explain the theory of travelling magnetic field and applications of lin
		CO6	Understand the significance of electrical motors for traction drives.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2		1	2	2	
CO2	3	2	1	2	2	
CO3	3	2	2	2	1	
CO4	3	2	1	2	1	
CO5	3	2	2	2	2	
CO6	2	1	1	2	2	

12027	tion Laboratory	CO1	Able To Simulate Single Phase Full Bridge Converter & Transient Resp
		CO2	Able ToSimulate Modeling Of Transformer &lossy transmission line.
		CO3	Able To SimulateSingle Phase Ac Voltage Controller.
		CO4	Able To SimulateSingle Phase Inverter With PWM Control.
		CO5	Able To Simulate Buck Chopper.
		CO6	Able ToSimulateIntegrator and differentiator.
		CO7	Able To Find the Stability of a Given System & Load flow analysis by I
		CO8	Able To Simulate Three Phase Full Bridge Converter.

R1641 | Electrical Simula

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	3	2	2	2	
CO2	2	2	2	2	1	
CO3	3	2	2	2	2	
CO4	2	2	2	3	2	
CO5	2	2	1	2	2	
CO6	2	1	2	3	2	
CO7	3	2	3	2	2	
CO8	2	2	2	3	2	

R16412028 | Power Systems Laboratory

CO1	Able to understand the power flows and stability in power system.
CO2	Students can execute energy management systems functions at load
CO3	Able to understand affect of various faults in various power system c
CO4	Able to determine the parameters of various power system compon

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	2	2	2	
CO2	2	2	2	2	2	
CO3	1	1	1	1		
CO4	1	2				

IV Year – II Ser

Digital Control Systems

CO1	Ability to understand the sampling theorem
CO2	Learn how to calculate the Z-transforms
CO3	Ability to solve the discrete time state space equations, checking cor
CO4	Learn how to check the stability of discrete time systems
CO5	Ability to design using frequency response in the w–plane for lag and
CO6	Students can design a controller and observer through pole placeme

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	2	3	0	-	0
CO2	3	2	2	2	-	1
CO3	3	2	3	2	-	1
CO4	2	2	2	2	1	1
CO5	3	2	1	1	-	0
CO6	2	2	1	1	-	0

2022 | smission

CO1	To Understand the basic concepts of HVDC systems
CO2	To Analyze the operation of HVDC converters
CO3	To Know the control characteristics of DC
CO4	To acquire control concept of reactive power control and AC/DC load
CO5	To Understand converter faults, protection and harmonic effects
CO6	To Design low pass and high pass filters

R164

HVDC Tran

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	1	1	1	O	0
CO2	1	2	1	2	1	0
CO3	1	2	1	2	2	0
CO4	1	2	2	2	2	0
CO5	1	2	2	2	2	0
CO6	1	2	2	2	2	0

Electrical Distribution Systems

CO1	Ability to understand the different distribution system and classificat
CO2	Ability to design distribution feeders and optimal location of substati
CO3	Able to derive voltage drop and power loss in lines, to know the diffe
CO4	Able to know the co-ordination of protective devices.
CO5	Able to know compensation for power factor improvement.
CO6	Able to know equipment for voltage controller.

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	3	3			
CO2	3	3	1			
CO3	1	3	1			
CO4	1	1				
CO5	1	2				
CO6	3	3	3			

Flexible Alternating Current Transmission Systems

CO1	Determine power flow control in transmission lines by using FACTS c
CO2	Explain operation and control of voltage source converter.
CO3	Discuss compensation methods to improve stability and reduce pow
CO4	Explain the method of shunt compensation by using static VAR comp
CO5	Appreciate the methods of compensations by using series compensa
CO6	Explain the operation of modern power electronic controllers (Unifie

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	-	1	1	-
CO2	2	1	-	-	-	-
CO3	2	2	-	-	1	--
CO4	2	2	1	-	1	-
CO5	2	2	1	-	-	-
CO6	3	1	-	-	1	-

inar

CO1	Access information in a variety of ways, by using library collections a
CO2	Demonstrate effective writing skills by employing various techniques
CO3	Understand the role that effective presentations have in public/prof
CO4	Demonstrate the ability to collaborate with others as they work on r

Semi

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	-	3	-	-
CO2	-	-	-	-	-	-
CO3	3	-	-	-	-	-
CO4	2	-	-	2	2	-

Project

CO1	Able to acquire the requisite skills and to apply the same to a given
CO2	Able to independently analyse and discuss complex inquiries/proble
CO3	Able to reflect on, evaluate, and critically assess one's own results ar
CO4	Able to document and present one's own work for a given target gro
CO5	Able to identify one's need for updating skills and knowledge and to

	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	2	2			
CO2	2	2	2	2		2
CO3	3	2	3	2	3	2
CO4	2	2	2	2	3	1
CO5	2	2	3	1	2	

JTE OF TECHNOLOGY

ECTRONCIS ENGINEERING

TRIX

EM

ɔcial or transactional dialogues spoken by native speakers of English (L3)

ːt word forms and take notes while listening to a talk/lecture to answer questions (L3)

nformal discussions (L3)

g texts (L3)

le (L4)

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
		2	3		1		

se their applications.

d its applications.

ial differential equations

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
					1		

compounding and reframing &fabrication of polymers, plastics and

c value determination , Ranking and Analysis of coal by proximate and ultimate methods

ːells, electrode potentials, concentration cells , rechargeable batteriesApplytheknowledge

er conductors and Illustrate the applications of cleaner and greener synthetic methods

is of ultra pure semiconductors, working of rectifiers and transistors, insulating materials,

of photovoltaic cell, design of hydropower plant, tidal power, geothermalenergy, bio gas

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	2	-	-	-
-	-	-	-	2	2	-	-
-	-	-	-	1	3	-	-
-	-	-	-	1	3	-	-

-	-	-	-	1	1	-	-
-	-	-	-	1	2	-	-
				1.33	2.2		

pplication.

blems using graphical methods and law of triangle forces.

: of inertia including transfer methods and their applications.

ear path, its velocity and acceleration computation and methods of representing plane

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	-	-
-	-	-	-	-	2	-	-
-	-	-	-	-	2	-	-
-	-	-	-	-	2	-	-
-	-	-	-	-	2	-	-
-	-	-	-	-	2	-	-
					2		

ic solutions to problems.

t

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	2
-	-	-	-	-	-	2	2
-	-	-	-	-	-	2	2
-	-	-	-	-	-	2	2
						2	2

,and Applyconservation practices

aluatethe stages involved in EIA

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
3	-	-	-	-	3	-	-

3	-	-	-	-	3	-	-
3	-	-	-	-	3	-	-
3	-	-	-	-	3	-	-
3	-	-	-	-	3	-	-
3	-	-	-	-	3	-	-
3					3		

)

umentation techniques (L5)

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	1	2	-	-	2	-	-
-	1	3	-	-	1	-	-
-	1	2	-	-	1	-	-
	1	2.33			1.33		

ocial or transactional

nglish; formulate

ıg texts; produce a

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
		2	3		1		

ce

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	-	-
-	-	-	-	-	-	1	-
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-
-	-	-	-	-	-	2	-
-	-	-	-	-	-	3	-
-	-	-	-	-	-	3	-
						2.17	

EM

ormation into nonverbal information

d speak in English without inhibition

for English communication

cation and critically respond in English to a real life situations

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
		2	3		1		

ndental equations

s in engineering apart .

ation

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
					1		

nd volumes of solids.

ntegral theorems.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-

-	-	-	-	-	1	-	-
					1		

ɔts of light
ts of light.
ed.
in Quantum mechanics.
miconductor Physics and

PO7	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
					1		

assive elements.
ameters i.e R, L, C. and f.
rems.

PO7	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
						3	
						3	1
						2	
					1	3	2
					1	2	3
						1	1

nciples of projection &to draw Orthographic projections of points.
lines.
hic projections.

PO7	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-

-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
-	-	-	-	-	1	-	-
					1		

useful points and paraphrase short academic texts using suitable strategies and
slides with relevant graphical elements (L3)
anguage strategies (L3)
ts (L2)

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
-	-	2	3	-	1	-	-
		2	3		1		

s of light
s of light
ned
ear power generation
s of magnetic and

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

.
eparations.
ets using proper tin smithytools.
e on assembling and disassembling aPC.
nowledge on basics of internet and worldwide web.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

-	1	1	-	1	1	-	-
-	1	1	-	-	-	-	-
-	1	1	-	1	1	-	-
-	1	1	-	-	-	-	-
-	-	-	2	-	-	1	1
-	-	1	1	-	-	2	2
-	-	1	1	-	-	1	2
-	-	2	2	1	-	-	-

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lition.

ndition.

with different types of excitations.

k parameters.

ven network transfer function.

he response of a electrical network.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	2	1
-	-	-	-	-	2	2	1
-	-	-	-	-	1	2	1
-	-	-	-	-	1	2	1
-	-	-	-	-	2	2	1
-	-	-	-	-	1	1	1

sion.

mmutation in dc machines.

he speed of dc motors.

e transformers.

thods and achieve three-phase to two-phase transformation.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	2	
-	-	-	-	-	3	3	2
-	-	-	-	-	1	3	2
-	-	-	-	-	1	3	2
-	-	-	-	-	2	3	2
-	-	-	-	-	3	1	2

g Laplace's or Possion's equations, for various electric charge distributions.

ion of ampere's law and the Maxwell's second and third equations.
in magnetic field
the magnetic field.
nt current and Poynting vector.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
0	0	0	0	0	0	3	0
0	0	0	0	0	1	3	2
0	0	0	0	0	1	2	3
0	0	0	0	0	1	2	2
0	0	0	0	0	0	3	1
1	0	0	0	0	0	1	1

ngines, evaluation and performance of different systems in IC engines
explain the working principles of impulse & reaction turbines including their efficiencies
d the impact of jet on vanes, explain the working principles of hydraulic pumps including
s governing operation
erent loads by considering various factors

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
2	0	0	0	2	0	3	1
0	0	0	0	2	1	3	1
1	0	0	0	2	1	2	2
0	0	0	0	2	2	2	1
0	0	0	0	2	1	3	1
0	0	0	0	2	1	1	1

and.
even analysis to determine breakeven point.
business organization.
ject worth.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	2	2	3	2
-	-	-	-	2	2	3	3
-	-	-	-		2	3	2
2	-	-	-	2	2	3	3
-	-	-	2	2	2	3	2
-	-	-	-	3	2	3	3

r lagging and leading networks.
s.
ed loads

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
1					1	2	2
1					1	2	2
1					1	2	2
2					2	2	2
1					2	2	2

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and current for ac and dc.
and energy – able to calibrate energy meter by suitable method
ers
easuring instruments
ing CRO. Able to use digital instruments in electrical measurements.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		
						1	1
							1
						1	1

tion motor.
motor and induction generator.
nduction motors.
hronous generators.
ection of power factor with synchronous motor.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	-	-	-	-	1	2	2
	-	-	-	-		2	2
	-	-	-	-	1	1	
	-	-	-	-		2	1
	-	-	-	-		2	1
	-	-	-	-		1	

rations, r's complement representation, binary codes, logic gates and K-maps
iplexer, Comparator and etc
the procedure to Design simple applications like PROM, PAL and PLA.
sign different modulus counters.
sign different modulus counters.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	1	2
-	-	2	-	-	-	2	1
-	-	-	-	-	2	2	2
-	-	-	-	-	-	2	1
-	-	-	-	-	2	2	2
-	-	-	-	-	-	2	1

nination of overall transfer function using block diagram algebra and signal flow graphs.
r systems and to determine error constants.
ems using Routh's stability criterion and the root locus method.
nse methods.
performance from Bode diagrams.
the response. Understanding the concepts of controllability and observability.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
0	0	0	0	0	0	3	0
0	0	0	0	0	1	3	2
0	0	0	0	0	1	2	3
0	0	0	0	0	1	2	2
0	0	0	0	0	0	3	1
1	0	0	0	0	0	1	1

ower plants.
wer plants.
s and also estimate voltage drops of distribution systems.
insulated substations.
ifferent insulating materials.
generation and tariffs.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
						1	
					1	1	1
					1	2	
						2	

					1	2	1

of work study and SQC to improve productivity.

lems

es.

actices.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	2	2	2	2	-	2
-	-		2	2	2	-	2
-	-	2	3	2	2	-	2
-	-	-	2	3	2	-	2
-	-	-	2	2	2	-	2
-	-	-	2	2	2	-	2

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
					1	2	1
					1	2	1
					1	2	1

des

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
					1	2	1
					1	2	1
					1	2	1
					1	2	1

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s during different operating conditions.

ion lines.

lines.

ission lines.

formance of line insulators.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	2
					1	3	1
					1	1	1
					1	1	1
					1	2	1
					1	3	1

on earth's surface.

rgy systems.

neration.

and geothermal systems.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		
					1		
					2		
					2		
					1		
					1		

ferent operations on signals, understand principles of vector spaces, Concept of orthgonality

sing Fourier series. Analyse the continuous-time signals and continuous-time systems using

ete-time signal and reconstruct back

nse of LTI system. Understand the concept of convolution, correlation, energy spectral densi

systems and understand the concept of region of convergence.

nd understand the concept of region of convergence

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	3	3
-	-	-	-	-	-	3	3
-	-	-	-	-	3	2	2
-	-	-	-	-	-	2	3
-	-	-	-	-	2	3	3
-	-	-	-	-	2	3	3

e RC, RLC circuits

various digital circuits.

d analyze different types of Sampling Gates

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	2	3	3
-	-	-	-	-	2	3	3
-	-	-	-	-	3	3	2
-	-	-	-	-	1	3	3
-	-	-	-	-	-	2	2
-	-	-	-	-	-	2	2

nd analyze the static and dynamic characteristics of SCR's.

ze harmonics in the input current.

es for voltage control and harmonic mitigation and analyze the operation of AC-AC

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	1						
	1						
	1						
	1						
	1						
	1						

uction motors.

rious methods.

e of three–phase synchronous motor.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
					1	2	1
					1	2	1
					1	2	1

C and A.C. servo motors and synchronous motors

ag–lead compensators

the transfer function of DC motor

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		-		-		1	-
		-		1		1	-
		-		-		-	-
		-		1		1	-

current, power, energy and electrical characteristics of resistance, inductance and

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	
						1	

ctual properties (IPs) and their roles in contributing to organizational competitiveness.

ual Property.

wnership, scope of protection as well as the ways to create and to extract value from IP.

l sectors for the purposes of product and technology development.

available to the IP owner and describe the precautious steps to be taken to prevent

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
3	-	2	2	2	-	1	2
2	-	2	2	2	-	2	2
2	-	2	2	3	-	1	-
3	-	-	2	2	-	2	3
-	-	2	-	2	-	-	2
-	-	2	2	-	-	2	1

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ing methods.

our quadrant operations of dc motors using dual converters.

operation

oltage controllers and voltage source inverters.

hase induction motor..

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	2
					1	3	1
					1	1	1
					1	1	1
					1	2	1
					1	3	1

o understand per unit quantities.

ifferent methods.

the design of protective devices.

wer system network.

cepts of a power system

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						1	2
						2	1
						1	1
						2	1
						1	1
					1	2	2

lore the evaluation of microprocessors.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
						2	
						2	
						1	2
						2	2

and their operations.

ks and queues, and will be able toillustrateapplications stacks.

ill be able apply linked list to implement stacks and queues.

es, binary search trees.

ues in the area of performance.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	1	1	-	-	-	-
-	-	1	1	-	-	-	-
-	-	2	2	-	-	-	-

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		2
					2		2
					2		2
					1		2
					2		2
					2		2

and analyze gate drive circuits of IGBT.
l wave bridge converters with both resistive and inductive loads.
or with resistive and inductive loads.
singlephase square wave inverter and PWM inverter.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		1					
		1					
		1					
		1					

ning of microprocessor.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2

					1	1	
					1	1	1
					1	1	

ked lists.
trees, graphs, etc. tosolve various computing problems.
al world problems.
ecide when to choosewhich technique.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-

o the students that is relevant to resolving moral issues in engineering
l concepts to engineering decisions
engineering areas, and to provide an understanding of the interface between social,
in the implementation of the engineering projects.
the budding engineers and make them uncorrupted.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	3	-	-	1	1	2	1
-	2	-	-	3	2	1	2
-	2	-	-	1	1	2	1
-	2	-	-	1	-	-	2
-	3	-	-	1	1	-	1
-	3	-	-	1	1	1	2

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olications
suitable applications.
t illuminating sources.
and recommend the most efficient illuminating sources and should be able to design differ
of traction motors.
eration

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	1
						1	
					1	1	1
					1	2	

						2	
					1	2	1

lifiers.
ːe parameters of OP-AMP.
nplifiers.
filters using op-amps
L and Timers.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	-	3	2
-	-	-	-	-	-	3	3
-	-	-	-	-	2	2	3
-	-	-	-	-	3	3	3
-	-	-	-	-	-	2	3
						1	

a systems.
nission line.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	1	2	1	2
-	-	-	-	-	2	-	1
-	-	-	-	1	2	1	1
-	-	-	-	-	2	-	1
-	-	-	-	1	2	-	1
-	-	-	-	1	2	1	2

to high voltage circuit breakers of air, oil, vacuum, SF6 gas type.
ıt types of electromagnetic protective relays.
;h power generator and transformers.
nes used for feeders and bus bar protection.
ons.
chemes required for insulation co–ordination.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	1	2	1
-	-	-	-	-	2	1	2

-	-	-	-	-	1	-	1
-	-	-	-	--	-	2	2
-	-	-	-	-	-	1	1
-	-	-	-	-	1	2	3

ocity, temperature, pressure etc.
digital voltmeters.
gnal with the help of CRO.
analyzers.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		2
					2		1
					1		-
					-		2
					-		1
					1		2

C motors
plications.
or.
ear motors.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		1
					1		1
					1		1
					1		1
					1		1
					1		1

ponse Of Rlc Circuit.
Newton Raphson method.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1		2
					2		2
					2		2
					2		2
					2		1
					1		2
					2		2
					2		2

l dispatch centre.

:omponents.

ents.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		1			1		2
		1					2
		1					1
		1					1

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ıtrollability and observability and finding the stability

l led compensators

nt technique and using Ackerman's formula

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
0	0	0	0	0	0	3	0
0	0	0	0	0	1	3	2
0	0	0	0	0	1	2	3
0	0	0	0	0	1	2	2
0	0	0	0	0	0	3	1
1	0	0	0	0	0	1	1

l flow.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
0	0	0	0	0	1	1	1
0	0	0	0	0	1	1	2
0	0	0	0	0	1	1	2
0	0	0	0	0	1	1	2
0	0	0	0	0	1	1	2
0	0	0	0	0	1	1	2

tion of loads.
ions.
erent types of faults and protective devices.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
					1	2	2
					1	3	1
					1	1	1
					1	1	1
					1	2	1
					1	3	1

ontrollers.

er oscillations in the transmission lines.
pensators.
ators.
ed Power Quality Conditioner and Interline Power Flow Controller).

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	1	2	1
-	--	-	-	-	2	1	2
-	-	-	-	-	1	1	2
-	-	-	-	-	-	2	1
-	-	-	-	-	-	2	1
-	-	-	-	-	1	2	3

nd services and other search tools and databases.
s of academic writing.
essional contexts and gain experience in formal/ informal presentation.
eading, writing, speaking, researching skills.

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
-	-	-	-	-	3	2	2
-	2	3	3	-	2	-	-
-	-	-	-	-	2	3	-
-	-	-	2	-	3	2	-

problem in the relevant technical area.
ms within the given constraints and handle larger problems at an advanced level within
nd correlate it with other scientific results.
up, with strict requirements on structure, format and language usage.
o continuously develop one's own competencies

PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
		2				3	
		2		3	1	2	2
		3		2	1	2	3
		3		3	1	2	2
		2		2	1	3	1