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KUPPAM ENGINEERING COLLEGE

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(Recognised by UGC(f) & 12(b))

KUPPAM - 517 425, Chittoor Dist., A.P. ☎: 08570 - 256966 (O), 256977 (F)

principal@kec.ac.in

B.Tech. (EEE) – Course Outcomes Regulation : R20



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R20

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

R20 CO-PO-PSO MAPPING

Year/Sem: I/I

Subject code: 20A54101		Subject Name: Linear Algebra & Calculus													
CO1	Solve systems of linear equations; determine the rank, eigenvalues and eigenvectors.														
CO2	Analyse the behaviour of functions by using mean value theorems														
CO3	Find partial derivatives numerically and symbolically and use them to analyse and interpret the way a function varies.														
CO4	Apply double integration techniques in evaluating areas bounded by region														
CO5	Find beta and gamma functions and its relations														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1	2	2	2										3		
CO 2	2	2	3	3									1	1	
CO 3	3	2	3	1									1	3	
CO 4	2	2													
CO 5	1	1													

P. Kumar
Program Co-ordinator

[Signature]
HOD
Head of the Dept.
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Subject code: 20A56201T		Subject Name: Applied Physics												
CO1	Identify the importance of the optical phenomenon.													
CO2	Explain the significant concepts of dielectric and magnetic materials.													
CO3	Impart knowledge in basics concepts of electromagnetic waves.													
CO4	Identify the importance of semiconductor and superconductivity.													
CO5	Familiarize the applications of Nano materials relevant to engineering branches.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2											3	
CO 2	3	2											3	
CO 3	3												3	
CO 4	3												3	
CO 5	3		3											3

P. Kiran
Program Co-ordinator

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Subject code: 20A52101T		Subject Name: Communicative English 1												
CO1	Compose letters and writing paragraphs													
CO2	Could analyse graphs and charts													
CO3	Compose SMS and writing E-mails													
CO4	Participate effectively in GD and debate													
CO5	Comprehend and write report according to the requirement													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1									1	3			2	2
CO 2									2	3			1	1
CO 3									1	3			1	3
CO 4									2	3			2	
CO 5									1	3				1



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Subject code: 20A02101T	Subject Name: Fundamentals of Electrical Circuits
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CO1	Basic characteristics of R, L, C parameters, their Voltage and Current Relations and Various combinations of these parameters.
-----	--

CO2	The Single Phase AC circuits and concepts of real power, reactive power, complex power, phase angle and phase difference.
-----	---

CO3	Series and parallel resonances, bandwidth, current locus diagrams.
-----	--

CO4	Network theorems and their applications.
-----	--

CO5	Network Topology and concepts like Tree, Cut-set , Tie-set, Loop, Co-Tree
-----	---

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
	Cos													
CO 1	3	3	2											2
CO 2	3		3										3	3
CO 3	3	2											3	
CO 4	3												3	
CO 5	3												3	


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Subject code: 20A56201P		Subject Name: Applied Physics Lab												
CO1	Understands the concepts of interference and diffraction and their applications.													
CO2	Understand the role of optical fibre parameters in communication.													
CO3	Recognize the importance of energy gap in the study of conductivity and hall effect in a semiconductor.													
CO4	Illustrate the magnetic and dielectric materials applications.													
CO5	Apply the principle of semiconductor in various electronic devices.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3			3										3
CO 2	3												3	
CO 3	3	2											3	
CO 4	3		2											2
CO 5	2		3										3	


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Subject code: 20A52101P		Subject Name: Communicative English 1 Lab													
CO1	Make use of pronunciation and accent.														
CO2	Apply the stress pattern and voice modulation														
CO3	Improves participation in just a minute and role play.														
CO4	Develop interview skills.														
CO5	Illustrate fluently a review of book or movie efficiently.														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1									1	3					
CO 2									2	3					
CO 3									1	3					
CO 4									2	3					
CO 5									1	3					


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Subject code: 20A02101P		Subject Name: Fundamentals of Electrical Circuits Lab													
CO1	Remember, understand and apply various theorems and verify practically.														
CO2	Understand and analyse active, reactive power measurements in three phase balanced & un balanced circuits.														
CO3	Analyse active power measurements in three phase balanced & un balanced circuits														
CO4	Analyse, reactive power measurements in three phase balanced & un balanced circuits														
CO5	Analyse three phase balanced & un balanced circuits														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1	3	2	3										3		
CO 2	2	2	2										3		
CO 3	3	2	3										2		
CO 4	2	2	3										2		
CO 5	2	2	3												


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Subject code: 20A03101T		Subject Name: Engineering Drawing													
CO1	Understand the significance of engineering drawing														
CO2	Know how to draw the projections of points, lines														
CO3	Understand the procedure to draw projection of solids														
CO4	Draw the sectional views of prism, cylinder, pyramid and cone														
CO5	Show projections of solids and sections graphically														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1	2	2											3		
CO 2	2	3											3		
CO 3	3	2											3		
CO 4	2	3											3		
CO 5	2	2											3		


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Year/Sem: I/II

Subject code: 20A54201		Subject Name: Differential Equations and Vector Calculus												
CO1	Solve the differential equations related to various engineering fields													
CO2	Identify solution methods for partial differential equations that model physical processes													
CO3	Interpret the physical meaning of different operators such as gradient, curl and divergence													
CO4	Estimate the work done against a field, circulation and flux using vector calculus													
CO5	Evaluate the rates of fluid flow along and across curves													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	2	2											3	
CO 2	2	3											3	
CO 3	3	2											3	
CO 4	2	3											3	
CO 5	2	2											3	


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Subject code: 20A51101T		Subject Name: CHEMISTRY												
CO1	Compare the materials of construction for battery and electrochemical sensors													
CO2	Explain the preparation, properties, and applications of thermoplastics & thermo settings, elastomers & conducting polymers													
CO3	Explain the principles of spectrometry, GC and HPLC in separation of gaseous and liquid mixtures													
CO4	Apply the principle of supramolecular chemistry in application of molecular machines and switches													
CO5	Demonstrate the application of Rotaxanes and Catenae's as artificial molecular machines													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2											3	
CO 2	3	3											3	
CO 3	3												3	
CO 4	3		3										2	
CO 5	2		3											3


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Subject code: 20A04101T		Subject Name: 20A04101T Electronic Devices & Circuits												
CO1	Understand principle of operation, characteristics and applications of Semiconductor diodes, Bipolar Junction Transistor and MOSFETs													
CO2	Applying the basic principles solving the problems related to Semiconductor diodes, BJTs, and MOSFETs., properties, and applications of thermoplastics & thermo settings, elastomers & conducting polymers													
CO3	Analyse diode circuits for different applications such as rectifiers, clippers and clampers also analyse biasing circuits of BJTs, and MOSFETs.													
CO4	Design of diode circuits and amplifiers using BJTs, and MOSFETs													
CO5	Compare the performance of various semiconductor devices													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2											3	3
CO 2	3	3											3	
CO 3	3												3	3
CO 4	3		3										2	
CO 5	2		3											3


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Subject code: 20A05201T		Subject Name: C-Programming & Data Structures												
CO1	C-Programming & Data Structure													
CO2	Identify the various Binary tree traversals													
CO3	Illustrate different Graph traversals like BFS and DFS													
CO4	Design the different sorting techniques													
CO5	Apply programming to solve searching and sorting problems													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2	3											3
CO 2	3	2		3									2	
CO 3	2	3	2	2										
CO 4	2		2	2										3
CO 5	2	2		3										2


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Subject code: 20A03202		Subject Name: Engineering Workshop												
CO1	Apply wood working skills in real world applications													
CO2	Build different parts with metal sheets in real world applications													
CO3	Apply fitting operations in various applications													
CO4	Apply different types of basic electric circuit connections													
CO5	Demonstrate soldering and brazing													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2		3									3	
CO 2	2		3											
CO 3	3	3		3										
CO 4	3	2		3									3	
CO 5	2		3										2	


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Subject code: 20A05202		Subject Name: IT WORKSHOP													
CO1	Disassemble and Assemble a Personal Computer and prepare the computer ready to use														
CO2	Prepare the Documents using Word processors and Prepare spread sheets for calculations .using excel and also the documents using Latex														
CO3	Prepare Slide presentations using the presentation tool														
CO4	Interconnect two or more computers for information sharing.														
CO5	Access the Internet and Browse it to obtain the required information.														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1	3		2	3									2		
CO 2	2	2	3	3									2		
CO 3	1	3	3												
CO 4	3	2			3									3	
CO 5	3	2		3										3	


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Subject code: 20A04101P		Subject Name: Electronic Devices & Circuits Lab												
CO1	Understand the basic characteristics and applications of basic electronic devices. (L1)Observe the characteristics of electronic devices by plotting graphs.													
CO2	Analyse the Characteristics of UJT, BJT, MOSFET													
CO3	Design MOSFET / BJT based amplifiers for the given specifications.													
CO4	Simulate all circuits in PSPICE /Multisim.													
CO5	To Model the electronic circuits using tools such as PSPICE/ Multisim.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2	1										2	
CO 2	3	2	3										1	
CO 3	3												2	
CO 4	3	3											2	
CO 5	2			3										3


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Subject code: 20A51101P		Subject Name: CHEMISTRY LAB												
CO1	Determine the cell constant and conductance of solutions													
CO2	Prepare advanced polymer materials													
CO3	Measure the strength of an acid present in secondary batteries													
CO4	Analyse the IR and NMR of some organic compounds													
CO5	Verify the fundamental concepts with experiments													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	2		3										3	
CO 2	3	2		3										3
CO 3	3	3		3									2	
CO 4		3											2	
CO 5	3	3												


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Subject code: 20A05201P		Subject Name: C-Programming & Data Structures Lab												
CO1	Demonstrate basic concepts of C programming language.													
CO2	Develop C programs using functions, arrays, structures and pointers.													
CO3	Illustrate the concepts Stacks and Queues													
CO4	Design operations on Linked lists													
CO5	Develop searching and sorting methods													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2	3										2	
CO 2	2	2											2	
CO 3	3	2	3											2
CO 4	2	2											3	
CO 5	2	2	2											2


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Subject code 20A99201		Subject name: 20A99201 Environmental Science													
CO1	Grasp multidisciplinary nature of environmental studies and various renewable and non-renewable resources														
CO2	Understand flow and bio-geo- chemical cycles and ecological pyramids.														
CO3	Understand various causes of pollution and solid waste management and related preventive measures.														
CO4	About the rainwater harvesting, watershed management, ozone layer depletion and waste land reclamation.														
CO5	Casus of population explosion, value education and welfare programmes.														
POs →	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
COs↓															
CO 1	2	2	2										3		
CO 2	2	2	3	3									2		
CO 3	3	2	3	2									2		
CO 4	2	2	3	3											
CO 5	3	2	3	3										3	


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II Year I Sem

Subject code : 20A54302		Subject name: COMPLEX VARIABLES & TRANSFORMS													
CO1	Understand the analytical of complex functions and conformal mappings.														
CO2	Apply cauchy's integral formula and cauchy's integral theorem to evaluate improper integrals along contours.														
CO3	Understand the usage of Laplace transforms, Fourier transforms and z transforms.														
CO4	Evaluate the Fourier series expansion of periodic functions.														
CO5	Understand the use of Fourier transforms and apply z transforms to solve difference equations.														
POs→	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
COs↓															
CO 1	2	2	2										3		
CO 2	2	2	3	3									2		
CO 3	3	2	3	1									2		
CO 4	2	2	1	3											
CO 5	3	1	1	3										3	


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Subject code : 20A02301T		Subject name: Electrical Circuit Analysis													
CO1	Identify the basic concepts of locus diagram and distinguish its parameters														
CO2	Illustrate the network parameters of T and π configuration of DC circuits.														
CO3	Analyze the performance of R-L, R-C, R-L-C series circuits using Transients.														
CO4	Develop the Fourier Fourier transforms Applications using non sinusoidal sources in electrical circuits.														
CO5	compare and summarize the types of filters and equalizers														
POs→	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
COs↓															
CO 1	3	3	2										3		
CO 2	2	3		3										3	
CO 3	2	2	3											2	
CO 4	3	3	2										3		
CO 5		3	2	3											


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Subject code:20A04303T		Subject Name: Digital logic design												
CO 1	The properties of Boolean algebra, other logic operations, and minimization of Boolean functions using Karnaugh map.													
CO 2	The concepts to solve the problems related to the logic circuits.													
CO 3	Analyze the combinational and sequential logic circuits													
CO 4	Develop digital circuits using HDL, and various Programmable logic devices													
CO 5	Design various logic circuits using Boolean algebra, combinational and sequential logic circuits													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	2												2	
CO 2	3	3											3	3
CO 3	3	3												
CO 4		3												
CO 5	2	3											3	


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Subject code:20A52201		Subject Name: UHV												
CO1	Students are expected to become more aware of themselves, and their surroundings													
CO2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.													
CO3	They would have better critical ability.													
CO4	They would also become sensitive to their commitment towards what they have understood													
CO5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	2	3	2											3
CO 2	3	2	3											3
CO 3	2	2	3											
CO 4	2	3	2											
CO 5	3	2	2										3	3


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Subject code:20A02301P		Subject name: Electrical Circuit Analysis Lab													
CO1	Compute the parameters of Two Port Networks														
CO2	Estimate the performance of R-L, R-C and R-L-C circuits with variation of parameters														
CO3	Calculate self , Mutual inductances of coupled circuits														
CO4	understand and analyzed locus diagrams of series RL, RC circuits.														
CO5	understand and verify the resonance phenomenon.														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1	3	2		3									2		
CO 2	3	3	2										3		
CO 3	2	2		2									2		
CO 4	3	2		3										3	
CO 5	2	2	3											3	


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Subject code: 20A02302P		Subject name : DC Machines & Transformers Lab												
CO1	Understand construction and working principle of single phase and auto transformers													
CO2	Acquire the knowledge of three phase transformers, different type of winding connection, parallel operation and testing of transformers.													
CO3	Explain construction and working principle of DC generator and various method of improving commutation.													
CO4	Describe the construction, working principle and characteristics of DC motor.													
CO5	Learn various method of starting and braking of DC motor.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3		2	3									3	
CO 2	3	3		3									3	
CO 3	3	2	3										3	3
CO 4	2	2	2										3	
CO 5	2	2	3										3	


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Subject code: 20A02303P		Subject name : Digital logic design LAB													
CO1	Understand the pin configuration of various digital ICs used in the lab														
CO2	Conduct the experiment and verify the properties of various logic circuits.														
CO3	Analyze the sequential and combinational circuits.														
CO4	Design of any sequential/combinational circuit using Hardware/ HDL.														
CO5	Understand the pin configuration of various digital ICs used in the lab														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1	3	3	2	2									3		
CO 2	2	2	2	2									3		
CO 3	2	3	2											2	
CO 4	2		2											3	
CO 5	2		2											3	


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II YEAR II SEM

Subject code: 20A54402		Subject Name: NUMERICAL METHODS & PROBABILITY THEORY												
CO1	Apply numerical methods to solve algebraic and transcendental equations													
CO2	Derive interpolating polynomials using interpolation formulae													
CO3	Solve differential and integral equations numerically													
CO4	Apply Probability theory to find the chances of happening of events.													
CO5	Understand various probability distributions and calculate their statistical constants.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2	3										3	
CO 2	3	2	3										2	
CO 3	3	2	2											3
CO 4	2	3	3											2
CO 5	3	2	2											


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Subject code: 20A04404T		Subject Name: Analog Electronic Circuits												
CO1	List various types of feedback amplifiers, oscillators and large signal amplifiers													
CO2	Explain the operation of various electronic circuits and linear Ics													
CO3	Apply various types of electronic circuits to solve engineering problems													
CO4	Analyse various electronic circuits and regulated power supplies for proper understanding													
CO5	Justify choice of transistor configuration in a cascade amplifier													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	3	2										3	
CO 2	3	2	2											3
CO 3	2	3	2										3	
CO 4	2	3	2											3
CO 5	3	2	2											3


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Subject code: 20A02401T		Subject Name: Power Electronics												
CO1	Understand the basic power semiconductor devices & detail study of their characteristics													
CO2	Understand the concepts of phase controlled rectifiers for single and three phases													
CO3	Understand the types of choppers and their waveforms													
CO4	Understand the single and three phase inverter using different loads													
CO5	Understand the concept of AC voltage controllers and Cyclo converters													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	3	3	2									3	
CO 2	3	3	3	3									3	
CO 3	3	3	2	2										3
CO 4	3	2	2	2										3
CO 5	3	2	2	2										3


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Subject code: 20A02402T		Subject Name: AC machines													
CO1	Understand the concept of windings, MMF's and rotating magnetic field														
CO2	Understand the operation and performance characteristics of Induction machines														
CO3	Understand the methods of starting, braking and determining equivalent circuit of single phase induction motor.														
CO4	Understand characteristics, performance and parallel operation of synchronous generator														
CO5	Understand the operation, starting methods, V and inverted V curves of synchronous motor														
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Cos															
CO 1	3	3	2	2									3		
CO 2	3	3	3	2									2		
CO 3	3	3	3	3									2		
CO 4	3	3	2	2										2	
CO 5	3	3	2	3										3	


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Subject Code : 20A02403T		Subject name: EMF												
CO1	Define the various laws concerning static electric and magnetic fields.													
CO2	Explain the behaviors of conductors and dielectrics in electric fields.													
CO3	Relate the electric dipole and dipole moment, magnetic dipole and dipole moment.													
CO4	Find the energy stored and energy density in static electric field & magnetic field.													
CO5	Solve the quantities associated with uniform plane wave motion in different media of transmission.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2											2	
CO 2	2	3											2	
CO 3	3	2											2	
CO 4	3	2												3
CO 5	3	2												3


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Subject code: 20A04404P		subject name: Analog Electronic Circuits Lab												
CO1	Construct various amplifier circuits													
CO2	Develop multistage amplifiers.													
CO3	Develop OPAMP based analog circuits.													
CO4	Understand working of logic gates.													
CO5	Build the Combinational and Sequential logic circuits.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3	2	3											3
CO 2	2												3	
CO 3	3	3	2										3	2
CO 4	3	3	3											3
CO 5		2											3	


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Subject code: 20A02401P		subject name: POWER ELECTRONICS LAB												
CO1	Demonstrate the Characteristics of SCR, MOSFET & IGBT													
CO2	Analyze the operation of firing circuits for SCR													
CO3	Classify and analyze control of different power electronic converters													
CO4	Analyze the operation of forced commutation circuits for SCR													
CO5	Analyze the operation of power electronic converter using simulation tools													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
Cos														
CO 1	3		3	2										3
CO 2	3		2	3										3
CO 3	3			3										3
CO 4	3		3	3										3
CO 5	3			3										3


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Subject Code : 20A99401		Subject name: Design Thinking for Innovation												
CO1	Define the concepts related to design thinking.													
CO2	Explain the fundamentals of Design Thinking and innovation													
CO3	Apply the design thinking techniques for solving problems in various sectors.													
CO4	Evaluate the value of creativity													
CO5	Formulate specific problem statements of real time issues													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
COs														
CO1	1	1											3	
CO2	2	2	1											
CO3	2	2												3
CO4	1	1											3	
CO5	3	3	3											3


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III YEAR I SEM

Subject code: 20A02502T		Subject name: Control Systems													
CO1	To make the students familiarize various representation of system.														
CO2	To make the students analyze the time response and steady state errors and error constants														
CO3	To make the students analyze the stability of linear system in time domain.														
CO4	To make the students design compensator based on the frequency domain specification.														
CO5	To develop linear models mainly state variable model and transfer function model.														
POs															
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
CO1	2	3	2	2									3		
CO2	3	2	2	2									2		
CO3	2	3	2	2									3		
CO4	2	3	2	2										2	
CO5	2	2	3	2										2	


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Subject code: 20A02503T				Subject Name: Measurements & Sensors										
CO1	Able to Understand the working of various instruments and equipment's used for the measurement of various electrical engineering parameters like voltage, current, power, phase etc in industry as well as in power generation, transmission and distribution sectors													
CO2	Able to analyze and solve the varieties of problems and issues coming up in the vast field of electrical measurements													
CO3	Analyse the different operation of extension range ammeters and voltmeters, DC and AC bridge for measurement of parameters and different characteristics of periodic and aperiodic signals using CRO													
CO4	Design and development of various voltage and current measuring meters and the varieties of issues coming up in the field of electrical measurements													
CO5	Understand various Lissajous pattern													
POs Cos	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2
CO1	3	2	3	2									3	2
CO2	2	3	2	3									2	3
CO3	3	3	3	2										2
CO4	2	3	3	2									2	3
CO5	3	2	2	3									3	2


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Subject code: 20A02504c				Subject name: Power Quality										
CO 1	Understand various number systems, error detecting, correcting binary codes, logic families, combinational and sequential circuits.													
CO 2	Apply Boolean laws, k-map and Q-M methods to minimize switching functions. Also describe the various performance metrics for logic families.													
CO 3	Construct combinational and sequential logic circuits.													
CO 4	Explain RAM, ROM, PROM, EPROM and PLDs.													
CO 5	Compare different types of Programmable logic devices and logic families.													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
COs														
CO 1	2												2	
CO 2	2												2	
CO 3	3												2	3
CO 4	3	3		3									3	
CO 5	2	2											2	


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Subject code: 20A02504a		Subject name: Switch gear and Protection												
CO1	To understand the purpose and operation of fuses and circuit breakers													
CO2	To understand the operation of relays and importance of zones of protection.													
CO3	To understand the various types of faults and protection schemes of faults in generators and transformers.													
CO4	To understand the protection of feeders, busbars, transmission lines and know about over current relay and 3 Zone protection													
CO5	To understand the concept on generation over voltages and protection and know about lightning arresters and insulation coordination.													
POs→	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
COs↓														
CO 1	2	2	3										3	
CO 2	2	3	2											2
CO 3	3	2	2											3
CO 4	3	2	3										2	
CO 5	2	3	2											2


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R20

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Subject Code : 20A02503P

Subject name: Measurements and sensors Lab

CO1 Calibrate various electrical measuring instruments

CO2 Find the values of inductance and capacitance using AC bridges

CO3 Solve the coefficient of coupling between two coupled coils.

CO4 Find the values of very low resistances

CO5 Experiment with Measurement of resistance for different range of resistors using bridges

POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
COs														
CO 1	2	2		2									2	2
CO 2	3	2		3									2	
CO 3	3	3		3										3
CO 4	3	2		2									3	
CO 5	3	3		3									3	


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Subject code: 20A02502P		Subject name: Control Systems And Simulation Lab												
CO1	examine the characteristics of various control system components													
CO2	interpret the effects of P, PI, PID controllers													
CO3	verify compensator characteristics and logic gates function through PLC													
CO4	analyze the response of a second order system													
CO5	illustrate the capability of effective usage of MATLAB in the analysis of Linear Time Invariant Systems													
POs→	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
COs↓														
CO 1	3	3		3									2	
CO 2	3	3		2									3	
CO 3	3	3		2										2
CO 4	3	3												3
CO 5	3	3		3									2	


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

III YEAR II SEM

Subject code: 20A02601		Subject name: Power System Analysis													
CO1	Remember and understand the concepts of per unit values, Y Bus and Z bus formation, load flow studies, symmetrical and unsymmetrical fault calculations.														
CO2	Apply the concepts of good algorithm for the given power system network and obtain the converged load flow solution														
CO3	Analyse the symmetrical faults and unsymmetrical faults and done the fault calculations,														
CO4	Analyse the stability of the system and improve the stability.														
CO5	Develop accurate algorithms for different networks and determine load flow studies and zero, positive and negative sequence impedances to find fault calculations.														
POs→	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
COs↓															
CO 1	3	2	3	2									3		
CO 2	3	3	3	3										2	
CO 3	3	3	3	2									2		
CO 4	3	2	3	2										3	
CO 5	3	3	3	3									3		


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Subject code: 20A02602T		Subject name: DIGITAL COMPUTING PLATFORMS												
co1	Understand the basic architecture & pin diagram of 8086 microprocessor, 8051 Micro controller													
co2	Apply the concepts to design Assembly language programming to perform a given task, Interrupt service routines for all interrupt types													
co3	Design Real time applications by writing Assembly Language Programs													
co4	Understand the basic concepts of DSP Processor and FPGA Processors.													
co5	Analyze various real time systems by using various controllers													
POs→ COs↓	Po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	psol	pso2
co1	3	3											3	3
co2	2	3	3										2	
co3		2	3	3										3
co4	3	3											2	3
co5	3	3	2	3									3	2


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Subject code: 20A02604a				Subject name: HVDC AND FACTS										
co1	Understand the necessity of HVDC systems as emerging transmission networks													
co2	Understand the necessity of reactive power compensation devices													
co3	Design equivalent circuits of various HVDC system configurations													
co4	Design and analysis of various FACTS devices													
co5	Analyze Unified Power Flow Controller													
POs→ COs↓	Po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2
co1	3												3	
co2	3												3	
co3		3	3	2										2
co4	3	3	2	3										3
co5	2	3	2	3										3


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Subject code:20A04502T			Subject name: DIGITAL SIGNAL PROCESSING											
Co1	Formulate difference equations for the given discrete time systems													
Co2	Apply FFT algorithms for determining the DFT of a given signal													
Co3	Compare FIR and IIR filter structures													
Co4	Design digital filter (FIR & IIR) from the given specifications													
Co5	Outline the concept of MultiMate DSP and applications of DSP													
POs→ COs↓	Po1	Po2	Po3	Po4	Po5	Po6	Po7	Po8	Po9	Po10	Po11	Po12	pso1	pso2
Co1	2	3	3										3	
Co2	3		3											2
Co3	2	3	3										3	
Co4	3	2	3											3
Co5	3	3	3											3


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Subject code: 20A02602P		Subject name: DIGITAL COMPUTING PLATFORMS LAB													
co1	Understand the basic concepts to write assembly language programming														
co2	Understand the basic concepts to write assembly language programming on 8086 Microprocessors.														
co3	Design various device configurations and Interfacing of various devices with 8086.														
co4	Understand the basic concepts to write programming on 8051 Microcontroller.														
co5	Design various Interfacing circuitry with 8051 Microcontroller with its peripheral devices														
POs→ COs↓	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2	
co1	2	3	3												
co2	3		2										3		
co3	2	2	3												
co4	2													2	
co5	2		3										3		


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.Subject code: 20A04502P					Subject name: DIGITAL SIGNAL PROCESSING LAB									
co1	Implement various DSP Algorithms using software packages													
co2	Implement DSP algorithms with Digital Signal Processor													
co3	Analyze and observe magnitude and phase characteristics (Frequency response Characteristics) of digital IIR-Butterworth, Chebyshev filters													
co4	Analyze and observe magnitude and phase characteristics (Frequency response Characteristics) of digital FIR filters using window techniques													
co5	Analyze digital filters using Software Tools													
POs→ COs↓	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	psol	psol
co1	3			3									2	
co2	3			3									3	
co3		3		3										3
co4		3		3										2
co5		3		3										3


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Subject code: 20A02601P				Subject name: POWER SYSTEMS ANALYSIS LAB										
co1	Get the practical knowledge on calculation of sequence impedance, fault currents, voltages and sub transient reactance's													
co2	Get the practical knowledge on how to draw the equivalent circuit of three winding transformer													
co3	Get the knowledge on development of MATLAB program for formation of Y and Z buses													
co4	Get the knowledge on development of MATLAB programs for Gauss-Seidel and Fast Decouple Load Flow studies													
co5	Get the knowledge on development of SIMULINK model for single area load frequency problem													
POs→ COs↓	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2
co1	2	2		3									3	
co2	3	2		2									2	3
co3	2		2										2	
co4			2										3	
co5			2	2									3	2

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

IV YEAR I SEM

Subject code: 20A02701a				Subject name: POWER SYSTEM OPERATION AND CONTROL										
co1	Understand to deal with problems in Power System as Power System Engineer													
co2	Understand to deal with AGC problems in Power System													
co3	Analyze the problems in hydro electric and hydro thermal problems													
co4	Evaluate the complexity of reactive power control problems and to deal with them													
co5	Understand the necessity of deregulation aspects and demand side management problems in the modern power system era													
POs→ COs↓	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2
co1	3	2		2									3	
co2	2	2	3										2	
co3	3	3		3									2	
co4	3	2		3										3
co5	2	3	3											2


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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Subject code: 20A52701b		Subject name: MANAGEMENT SCIENCE												
co1	Understand the concepts & principles of management and designs of organization in a practical world													
co2	Apply the knowledge of Work-study principles & Quality Control techniques in industry													
co3	Analyze the concepts of HRM in Recruitment, Selection and Training & Development.													
co4	Evaluate PERT/CPM Techniques for projects of an enterprise and estimate time & cost of project & to analyze the business through SWOT.													
co5	Create Modern technology in management science													
POs→ COs↓	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2
co1	3	2												3
co2	3	3	3										2	
co3	2	2												2
co4	3	2												
co5	2	2	2										3	

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Subject code: 20A02702a				Subject name: ELECTRICAL DISTRIBUTION SYSTEM & AUTOMATION										
co1	Understand the distribution system planning and automation													
co2	Explain the design considerations of sub transmission lines													
co3	Explain the design considerations of primary and secondary systems													
co4	Apply various protective devices and its coordination techniques to distribution system													
co5	Evaluate voltage drop and line loss calculations and design the capacitors and voltage regulating equipment to improve the power factor and voltage profile													
POs→ COs↓	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2
co1	2	3		2									3	
co2	3	2		3										2
co3	2	2		2									2	
co4	3	3	2											3
co5	3	2	3											2


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Subject code: 20A02703c		Subject name: ELECTRIC VEHICLE TECHNOLOGIES													
co1	Impact of modern drive-trains on energy supplies														
co2	Understand the concepts of electric vehicles, hybrid electric vehicles and their impact on environment														
co3	Analyse the drive-train topologies and advanced propulsion techniques														
co4	Analyse hybrid energy storage methodologies														
co5	Design suitable power converter topologies for motor control and hybrid energy storage														
POs→ COs↓	po1	po2	po3	po4	po5	po6	po7	po8	po9	po10	po11	po12	pso1	pso2	
co1	2	3	2	2									3		
co2	3	2	2	2									2		
co3	2	3	2	2									3		
co4	2	3	2	2										2	
co5	2	2	3	2										2	

P. K. Srinivas

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

IV YEAR II SEM

Subject code: 20A02801				Subject name: Project work										
CO1	Analyse the problem, formulation and solution of the selected project													
CO2	Develop solutions for contemporary problems using modern tools for sustainable development.													
CO3	Demonstrate ethical and professional sustainability while working in a team and communicate effectively for the benefit of the society.													
CO4	Understand the engineering, finance and management principles.													
CO5	Design and develop of electrical equipment's for domestic, industrial and agricultural needs													
POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
COs														
CO1	3	3	2	3									3	
CO2	3	3	3	2	3	3	2		3	3	2	3	3	3
CO3	3	3	3	2		2	3	3	2	3	3	3	3	3
CO4	3	3	3	2	3						2	2	3	
CO5	3	3	3									3	3	

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