RAMIREDDY SUBBARAMI REDDY ENGINEERING COLLEGE
(Promoted by RAMIREDDY SUBBARAMI REDDY EDUCATIONAL TRUST)
Approved by AICTE & Affiliated to JNTUA
An ISO 9001:2015 Certified Institution

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE OUTCOMES (COS) OF ALL COURSES FRAMED UNDER

JNTUA-R15 REGULATION

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List of all courses in EEE, offered by the institution for the regulation R15, JNTUA

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3	15A05101	Computer Programming	
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S.No	Course Code	Course Name	Year & Sem
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51	15A02701	Electrical Distribution Systems	IV-I Sem
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62	15A02807	Technical Seminar	
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Year& Sem	Course Code	Course Name	CO's	
I-I	15A52101	FUNCTIONAL ENGLISH	2101.1	Acquire good listening skills to participate effectively in group discussions, debates, and interviews and writing skills for effective technical report writing. (L2)
			2101.2	Develop oral communication skills in English to speak fluently in various academic and social situations. (L3)
			2101.3	Identify deviant use of English both in spoken and written forms, and improve awareness of its in science and technology. (L2)
			2101.4	Understand the importance of reading for life, and career and thereby develop an interest for it. (L2)
			2101.5	Demonstrate fundamental skills required for critical thinking. (L2)
Year& Sem	Course Code	Course Name	CO's	
I-I	15A54101	MATHEMATICS-I	2301T.1	Solve the First, Second and Higher order D.Es and Applications of First Order D.E (L3)
			2301T.2	Attain the knowledge of Applications of L.D.Es like Mechanical & Electrical Oscillatory circuits and deflection of beams (L2)
			2301T.3	Familiarize with functions of several variables which is useful in Optimizations. (L6)
			2301T.4	Determine important tools of calculus in Higher Dimensions (Multiple Integrals) (L5)
			2301T.5	Become familiar with the applications of vector calculus to Engineering Problems. (L6)

I B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name		CO's
I-I	**15A05101**	COMPUTER PROGRAMMING	5101.1	Apply problem solving techniques in designing the solutions for a wide-range of problems (L6)
			5101.2	Choose appropriate control structure depending on the problem to be solved (L4)
			5101.3	Modularize the problem and also solution (L5)
			5101.4	Apply problem solving techniques in designing the solutions for a wide-range of problems (L6)
Year& Sem	**Course Code**	**Course Name**		**CO's**
I-I	**15A56101**	ENGINEERING PHYSICS	6101.1	Analyze different realms of physics and their applications in both scientific and technological systems are achieved through the study of physical optics, lasers and fibre optics.(L2)
			6101.2	Analyze important properties of crystals like the presence of long-range order and periodicity, structure determination using X-ray diffraction are focused along with defects in crystals and ultrasonic non-destructive techniques.(L4)
			6101.3	Illustrate discrepancies between the classical estimates and laboratory observations of physical properties exhibited by materials would be lifted through the understanding of quantum picture of subatomic world. (L4)
			6101.4	Illustrate the properties and device applications of semiconducting and magnetic materials are illustrated (L4)
			6101.5	Design the importance of superconducting materials and nano materials along with their engineering applications are well elucidated. (L6)
Year& Sem	**Course Code**	**Course Name**		**CO's**
I-I	**15A03101**	ENGINEERING DRAWING	3101.1	Drawing 2D and 3D diagrams of various objects.[L6]
			3101.2	Learning conventions of Drawing, which is an Universal Language of Engineers.[L6]
			3101.3	Drafting projections of points, planes and solids.[L3]

I B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
I-I	15A52102	ENGLISH LANGUAGE COMMUNICATION SKILLS LAB	2102.1	Pronounce words correctly using speech sounds, word stress, intonation and rhythm. (L2)
			2102.2	Acquire proficiency in spoken English. (L2)
			2102.3	Apply English language skills effectively for interviews, group discussions, public speaking and debates with sheer confidence. (L3)
			2102.4	Develop their employability skills. (L3)
			2102.5	Identify techniques for writing a speech on an occasion and furthermore, give reviews on a book orally or in written form. (L3)
Year& Sem	Course Code	Course Name	CO's	
I-I	15A56102	ENGINEERING PHYSICS LAB	6102.1	Would recognize the important of optical phenomenon like Interference and diffraction. (L1)
			6102.2	Would have acquired the practical application knowledge of optical fiber, semiconductor, dieclectric and magnetic materials, crystal structure and lasers by the study of their relative parameters. (L3)
			6102.3	Would recognize the significant importance of nano materials in various engineering fields. (L1)
Year& Sem	Course Code	Course Name	CO's	
I-I	15A05102	COMPUTER PROGRAMMING LAB	5102.1	Apply problem solving techniques to find solutions to problems (L3)
			5102.2	Able to use C language features effectively and implement solutions using C language. (L4)
			5102.3	Improve logical skills. (L6)

I B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
I-II	**15A54201**	**MATHEMATICS – II**	4201.1	Understand the usage of Laplace Transforms. (L2)
			4201.2	Evaluate the Fourier Series expansion of periodic functions. (L5)
			4201.3	Understand the usage of Fourier Transforms. (l2)
			4201.4	Formulate/Solve/Classify the solutions of P.D.Equations and also find the solutions of 1-Dimensional Wave equations and Heat equations. (L6)
			4201.5	Understand the usage of Z-Transforms. (L2)

Year& Sem	Course Code	Course Name	CO's	
I-II	**15A52201**	**ENGLISH FOR PROFESSIONAL COMMUNICATION**	2201.1	Acquire good listening skills to participate effectively in group discussions, debates, and interviews and writing skills for effective technical report writing. (L2)
			2201.2	Develop oral communication skills in English to speak fluently in various academic and social situations. (L3)
			2201.3	Identify deviant use of English both in spoken and written forms, and improve awareness of its in science and technology. (L2)
			2201.4	Understand the importance of reading for life, and career and thereby develop an interest for it. (L2)
			2201.5	Demonstrate fundamental skills required for critical thinking. (L2)

Year& Sem	Course Code	Course Name	CO's	
I-II	**15A51101**	**ENGINEERING CHEMISTRY**	51101.1	Differentiate between hard and soft water.(L3)
			51101.2	Discuss BUNA-S and BUNA-N Elastromers (L2)
			51101.3	Understand the electrochemical sources of energy. (L3)
			51101.4	Discuss about solid, liquid, gaseous fuels (L2)
			51101.5	Understand the principles of lubricants and CNTs (L2)

I B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
I-II	15A01101	ENVIRONMENTAL STUDIES	1101.1	Differentiate between hard and soft water.(L3)
			1101.2	Discuss BUNA-S and BUNA-N Elastromers (L2)
			1101.3	Understand the electrochemical sources of energy. (L3)
			1101.4	Discuss about solid, liquid, gaseous fuels (L2)
			1101.5	Understand the principles of lubricants and CNTs (L2)

Year& Sem	Course Code	Course Name	CO's	
I-II	15A02201	ELECTRICAL CIRCUITS - I	2201.1	Determine the equivalent impedance of given network by using network reduction techniques and determine the current, voltage and power in any element(L3)
			2201.2	To understand voltage, current and power relationships in 1-ϕ AC circuits with basic elements R,L,C and determine the real power, reactive power, power factor etc,. For a Given a circuit and the excitation (L3)
			2201.3	Apply methods to find current locus diagrams of various circuits and explain the resonance phenomenon(L2,L3)
			2201.4	Apply the network theorems suitably(L3)
			2201.5	Determine various two port network parameters (L3)

Year& Sem	Course Code	Course Name	CO's	
I-II	15A51102	ENGINEERING CHEMISTRY LAB	1102.1	Determine the cell constant and conduct of the solutions.(L3)
			1102.2	Estimate the ferrous iron and Strength of an acid in battery. (L2)
			1102.3	Prepare the advanced materials and analyse the properties. (L3)
			1102.4	Analyze the IR and NMR spectroscopy. (L3)
			1102.5	Analyze the separation method of HPLC and TLC (L3)

I B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
I-II	**15A02202**	**ELECTRICAL CIRCUITS LAB**	2202.1	Demonstrate and apply various theorems and verify practically (L2)
			2202.2	Determine Self, Mutual Inductances and Coefficient of Coupling of magnetic coil (L2)
			2202.3	Determine and Draw Locus diagrams and resonance curves of electrical circuits (L3)
			2202.4	Experiment with active, reactive power measurements in three phase balanced Star circuits (L3)
			2202.5	Experiment with active, reactive power measurements in three phase balanced Delta circuits (L3)
			2202.6	Develop circuits to Measurement of 3-Phase Power by Two Wattmeter Method for Unbalanced Loads (L3)
			2202.7	Determine various two port network parameters of simple electrical circuits (L3)

Year& Sem	Course Code	Course Name	CO's	
I-II	**15A99201**	**ENGINEERING & I.T. WORKSHOP**	9201.1	Disassemble and Assemble a Personal Computer and prepare the computer ready to use.[L6]
			9201.2	Prepare the Documents using Word processors[L3]
			9201.3	Prepare Slide presentations using the presentation tool[L3]
			9201.4	Interconnect two or more computers for information sharing[L4]
			9201.5	Access the Internet and Browse it to obtain the required information[L6]
			9201.6	Install single or dual operating systems on computer[L3]

II B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name		CO's
II-I	15A54301	MATHEMATICS-III	4301.1	Develop the use of matrix algebra techniques i.e needed by engineers for practical applications (L6)
			4301.2	Apply Numerical methods to solve Algebraic and Transcendental equations. (L3)
			4301.3	Derive Interpolating polynomials using Interpolation formulae. (L4)
			4301.4	Solve Integral equations using Trapezoidal Rule, Simpson's 1/3 and 3/8 rules. (L3)
			4301.5	Solve Differential & Integral Equations numerically. (L3)

Year& Sem	Course Code	Course Name		CO's
II-I	15A02301	ELECRICAL CIRCUITS-II	2301.1	Determine the transient response of R-L, R-C, R-L-C circuits for D.C. and A.C. excitations [L2]
			2301.2	Analyze three phase balanced and unbalanced circuits and determine line voltages, line currents, phase voltages and phase currents [L4]
			2301.3	Apply Fourier transforms to electrical circuits excited by non-sinusoidal sources [L3]
			2301.4	Analysis of electrical networks, duality and dual networks [L4]
			2301.5	Calculate different types of filters [L4]

Year& Sem	Course Code	Course Name		CO's
II-I	15A02302	ELECTRICAL MACHINES-I	2302.1	To illustrate the principles of electromechanical energy conversion, to extract energy and force in a singly and multi excited systems. (L4)
			2302.2	To examine the construction and types of DC generators, analyze armature reaction and commutation in DC generators (L4)
			2302.3	To evaluate the failure of DC generator to build up voltage, get the complete idea of types of DC generators, their characteristics, compute the load shared by each generator when several generators are connected in parallel. (L5)
			2302.4	To gain Knowledge on Principle of DC motors, their types and their characteristics, determine the gross torque, useful torque developed by the motor, determine speed control of DC motors and operation of starters. (L1)
			2302.5	To estimate the losses of DC generators and motors, perform the testing of DC motors by direct and indirect methods and hence calculate the efficiency (L5)

II B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
II-I	15A02303	CONTROL SYSTEMS ENGINEERING	2303.1	Understand the concepts of control systems, classification, feedback effect, Mathematical modeling, servo motors, signal flow graphs. (L2)
			2303.2	Analyze Time domain specifications, steady state error, and controllers. (L4)
			2303.3	Analyze the concept of stability, Routh stability, Root locus.(L4)
			2303.4	Evaluate the frequency domain specifications, Bode plot, Nyquist plot, Compensators.(L5)
			2303.5	Understand the Concept of controllability, observability, the state transmission method of solving time invariant state equation.(L2)
Year& Sem	Course Code	Course Name	CO's	
II-I	15A04301	ELECTRONIC DEVICES AND CIRCUITS	4301.1	Analyze the operating principles of major electronic devices, its characteristics and applications.[L4]
			4301.2	Design and analyze the DC bias circuitry of BJT and FET.[L6]
			4301.3	Design and analyze basic transistor amplifier circuits using BJT and FET[L6]
Year& Sem	Course Code	Course Name	CO's	
II-I	15A05201	DATA STRUCTURES	5201.1	Understand different Data Structures [L2]
			5201.2	Understand Searching and Sorting technique[L2]

II B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name		CO's
II-I	15A02305	ELECTRICAL CIRCUITS SIMULATION LAB	2305.1	Explain electric circuit concepts by interpreting the simulation results (L2)
			2305.2	Design RLC series circuit for specified frequency response (L6)
			2305.3	Design RL, RC and RLC circuits for specified transient response (L6)
			2305.4	Analyze three phase balanced and unbalanced circuits (L4)
			2305.5	Verifies the maximum power dissipation (L5)
Year& Sem	Course Code	Course Name		CO's
II-I	15A04305	ELECTRONIC DEVICES AND CIRCUITS LABORATORY	4305.1	Understand the parameters of Diodes and transitors from the characteristics.(l2)
			4305.2	Demonstrate the rectifier and voltage regulator circuits using diodes.(L2)
			4305.3	Construct various amplifiers using BJTs and FETs.(L6)
			4305.4	Analyze the characteristics of SCR and UJT.(L4)

Year& Sem	Course Code	Course Name	CO's	
II-II	**15A54402**	MATHEMATICS-IV	4402.1	Learn the utilization of Special functions such as Beta and Gamma functions. (L4)
			4402.2	Learn the utilization of Bessel functions and Legendre Polynomials. (L1)
			4402.3	Understand the analyticity of complex functions and conformal mappings. (L2)
			4402.4	Apply Cauchy's Integral theorem and Cauch's integral formula. (L3)
			4402.5	Evaluate improper integrals of complex functions using Residue theorem. (L5)

Year& Sem	Course Code	Course Name	CO's	
II-II	**15A52301**	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	2301.1	To understand various aspects of Managerial Economics and analysis of financial statements [L2]
			2301.2	To understand inputs therein will help them to make sound and effective decisions under different economic environment and market situations [L2]
			2301.3	To understand market situations [L2]

Year& Sem	Course Code	Course Name	CO's	
II-I	**15A02401**	ELECTRICAL MACHINES-II	2401.1	Summarize the constructional aspects of a single phase transformer, emf equation, draw the equivalent circuit, extract various losses and hence calculate the efficiency and regulation. (L6)
			2401.2	Analyzing O.C & S.C tests on a single phase transformer and finding the regulation and efficiency, Examine different types of three-phase transformer connections like star-star etc, inspect auto transformers, their construction, analyze the parallel operation of transformers and load sharing (L4)
			2401.3	Elaborate the poly phase induction motors, their constructional details, gain knowledge on slip, rotor related parameters. (L2)
			2401.4	Determine the starting torque, maximum torque, slip at maximum torque, draw the circle diagram of a three-phase induction motor and predetermine the performance characteristics. (L3)
			2401.5	Apply speed control methods for a three-phase induction motor, implement starting methods. (L3)

II B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name		CO's
II-II	15A02402	ELECTRICAL POWER GENERATING SYSTEMS	2402.1	Determine the coal requirement, cost per kWh generation and number of units generated for thermal power station [L5]
			2402.2	Describe Estimate the required flow of river water, cost of generation and number of units generated in hydel power generation [L2]
			2402.3	Remember and understand the concepts of wind and solar power generation [L2]
			2402.4	Explain economic aspects of biogas [L2]
			2402.5	Explain and Plot the load curve, load duration curve and hence determine the load capacity of the plant [L2]
Year& Sem	Course Code	Course Name		CO's
II-II	15A02403	ELECTROMAGNETIC FIELDS	2403.1	Knowledge on basic principles, concepts and fundamental laws of electromagnetic fields.(L2)
			2403.2	Understands the concept of Conductors, Dielectrics ,polarization process(L2)
			2403.3	Knowledge of different laws for magneto statics, Develop MFI for different applications(L2,L6)
			2403.4	The knowledge to understand 3-dimensional co-ordinate systems, electrostatics, magneto statics, time-varying fields and interaction between electricity and magnetism.(LL2)
			2403.5	Understand the concepts of Magnetic Potential and Time varying Fields (L2,L4)

II B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
II-II	**15A04409**	ANALOG ELECTRONIC CIRCUITS	4409.1	Methods of biasing transistors & Design of simple amplifier circuits. [L3,L6]
			4409.2	Mid – band analysis of amplifier circuits using small - signal equivalent circuits to determine gain, input impedance and output impedance. [L3]
			4409.3	Method of calculating cutoff frequencies and to determine bandwidth (L5)
			4409.4	Design and analyze different Oscillator circuits [L6]
			4409.5	Design of circuits for linear wave shaping and Multi-vibrators.[L6]
Year& Sem	**Course Code**	**Course Name**	**CO's**	
II-II	**15A02404**	ELECTRICAL MACHINES LABORATORY-I	2404.1	Conduct experiments to obtain the no-load and load characteristics of D.C. Shunt Generators (L3)
			2404.2	Conduct and Analyze Direct and Indirect Tests on DC shunt motor (L3, L4)
			2404.3	Conduct experiments to obtain the load characteristics of D.C. compound Generators (L3)
			2404.4	Understand and analyze speed control techniques and efficiency of DC machines (L1, L6)
			2404.5	Analyze the losses and determine the efficiency of DC Motors (L6)

II B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name		CO's
II-II	15A02405	CONTROL SYSTEMS & SIMULATION LAB	2405.1	Design the controllers /compensators to achieve desired specifications [L6]
			2405.2	Understand the effect of location of poles and zeros on transient and stead state behavior of systems [L2]
			2405.3	Asses the performance , in terms of time domain specifications of first and second order systems [L4]
			2405.4	Use MATLAB/SIMULINK software for control system analysis and design [L2]
			2405.5	Determination of PI, PD and PID controller action of first order simulated process [L5]

III B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name		CO's
III-I	**15A02501**	**ELECTRICAL MEASUREMETS**	2501.1	Learns about different measuring instruments and calculates the errors in instruments(L2)
			2501.2	Determine the resistance values of various ranges, L and C values using appropriate bridges(L4).
			2501.3	Measure active power, reactive power, power factor, and energy in both 1-phase and 3-phase circuits(L5)
			2501.4	Use CTs and PTs for measurement of very large currents and high voltages(L3)
			2501.5	Understands about the magnetic fields by different instruments (L2)

Year& Sem	Course Code	Course Name		CO's
III-I	**15A04509**	**LINEAR & DIGITAL IC APPLICATIONS**	4509.1	Understand the basic building blocks of linear integrated circuits and its characteristics.(L1)
			4509.2	Design various multi-vibrator circuits using IC 555 timer. Understand the theory of ADC and DAC.(L6)
			4509.3	Design of active filters using op-amp. Analyze the various waveform Generators using op-amp.(L4)
			4509.4	Classification of IC's. Comparison of different logic families and analyze the concept of IC interfacing.(L4)
			4509.5	Design various combinational & sequential circuits.(L6)

Year& Sem	Course Code	Course Name		CO's
III-I	**15A02502**	**ELECTRICAL POWER TRANSMISSION SYSTEMS**	2502.1	Describe the transmission line parameters [L2]
			2502.2	Analyze the performance of a given transmission line [L3]
			2502.3	To get the complete idea of insulators [L2]
			2502.4	Analyze the effect of over voltages on transmission lines [L3]
			2502.5	Explain the construction, types and grading of underground cables and analyze cable performance. [L2]

III B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
III-I	15A02503	POWER ELECTRONICS	2503.1	Basic operating principles of power semiconductor switching devices(L2)
			2503.2	Ability to analyze various single phase & three phase power converter circuits and understand the applications(L4)
			2503.3	Learn the controlling strategies of choppers for different loads, Design the regulators with different IC's(L2)
			2503.4	Apply the different modulation techniques to inverters and identify the harmonic reduction methods(L3)
			2503.5	Constructs and demonstrate the operation of AC voltage controllers & Cyclo converters.

Year& Sem	Course Code	Course Name	CO's	
III-I	15A02504	ELECTRICAL MACHINES-III	2504.1	Learns the operation of Synchronous motor & harmonics elimination(L2)
			2504.2	predetermine the regulation of synchronous generators using different methods(L3)
			2504.3	Determine how several alternators running in parallel share the load on the system.(L5)
			2504.4	Make necessary calculations for power factor improvement using synchronous condenser.(L3)
			2504.5	Chooses specific 1-phase motor and/or special motors for a given application (L6)

Year& Sem	Course Code	Course Name	CO's	
III-I	15A04510	DIGITAL CIRCUITS AND SYSTEMS	4510.1	Understand the concept of numeric information in different forms and Boolean algebra [L2]
			4510.2	Evaluate the Boolean expressions using the theorems and Boolean algebra to minimize combinational functions [L5]
			4510.3	Analyze the sequential circuits [L4]
			4510.4	Understand the concept of memory devices [L4]
			4510.5	Analyze the synchronous and asynchronous sequential circuits [L4]

Year& Sem	Course Code	Course Name	CO's	
III-I	**15A02506**	**ELECTRICAL MACHINES LAB-II**	2506.1	Understand the testing of transformers, predetermine the efficiency and calculate the regulation of single phase transformers (L2)
			2506.2	Provide supply in industries when two-phase is required for furnaces using Scott connection (L3)
			2506.3	Draw the circle diagram of a three phase induction motor and determine its performance parameters (L6)
			2506.4	Assess the regulation of an alternator and determine the Xd and Xq parameters (L5)
			2506.5	Draw the V and Inverted V curves of a three phase synchronous motor (L6)
Year& Sem	**Course Code**	**Course Name**	**CO's**	
III-I	**15A02507**	**ELECTRICAL MEASUREMENTS LABORATORY**	2507.1	Students knows the idea of energy meter working and can calculate the power factor by dynamo meter(L3)
			2507.2	Students acquires knowledge on calibration of Ammeter & Voltmeter using Crompton's DC potentiometer (L3)
			2507.3	Accurately determine the values of inductance and capacitance & resistances using different bridges(L5)
			2507.4	Determine ratio error and phase angle error of CT(L5)
			2507.5	Measure reactive power in 3-phase circuit using single wattmeter(L5)
			2507.6	Students gets knowledge on testing the transformer oil (L5)
			2507.7	Calibrates the displacement and resistances using LVDT& Strain gauge(L5)
Year& Sem	**Course Code**	**Course Name**	**CO's**	
III-I	**15A99501**	**SOCIAL VALUES AND ETHICS**	9501.1	To Provide the basic building blocks for anyone who want to make decisions (L3)
			9501.2	To Evaluate objects, persons and situations that form part and parcel of sociality. (L5)
			9501.3	To apply ethical principles as a basis for identifying, analyzing and managing ethical issues in contemporary business settings. (L3)
			9501.4	To facilitate inculcating values of equality, inclusivity and diversity for building a healthy society. (L5)
			9501.5	To develop physical skills and confidence among the students. (L5)

III B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name		CO's
III-II	**15A52601**	MANAGEMENT SCIENCE	52601.1	Understand the concepts & principles of management and know the designs of organizational structures. (L2)
			52601.2	Apply the knowledge of Work-study principles & Quality Control techniques. (L3)
			52601.3	Analyze the concepts of HRM in Recruitment, Selection and Training & Development. (L4)
			52601.4	Evaluate PERT/CPM Techniques in project management& and Basic knowledge about Strategy formulation and implementation in enterprises. (L5)
			52601.5	Understand the modern concepts in management like SCM, BPO, Six Sigma and TQM. (L2)

Year& Sem	Course Code	Course Name		CO's
III-II	**15A02601**	POWER SEMICONDUCTOR DEVICES	2601.1	Identify the choice of the electric drive system based on their applications(L2)
			2601.2	Acquires knowledge on operation of single and multi quadrant electric drives(L2)
			2601.3	Analyze single phase and three phase rectifiers fed DC motors as well as chopper fed DC motors(L4)
			2601.4	Knowledge on speed control methods for AC-AC & DC-AC converters fed to Induction motors(L2)
			2601.5	Knowledge on speed control methods for AC-AC & DC-AC converters fed to Synchronous motors with closed loop, and open loop operations (L4)

Year& Sem	Course Code	Course Name		CO's
III-II	**15A02602**	POWER SYSTEM PROTECTION	2602.1	Gains the knowledge on principles of operation of various types of electromagnetic relays, Static relays as well as Microprocessor based relays(L2)
			2602.2	Understanding the protection of generators and determination of what % generator winding is unprotected under fault occurrence(L2)
			2602.3	Gets knowledge on relays in protecting Feeders, lines and bus bars(L2)
			2602.4	Solve numerical problems concerning the arc interruption and recovery in circuit breakers (L5)
			2602.5	Understand why over voltages occur in power system and how to protect the system (L2)

III B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
III-II	**15A04601**	**MICROPROCESSORS AND MICROCONTROLLERS**	4601.1	Do programming with 8086 microprocessors.(L6)
			4601.2	Understand concepts of Intel x86 series of processors(L2).
			4601.3	Program MSP 430 for designing any basic Embedded System.(L6)
			4601.4	Design and implement some specific real time applications Using MSP 430 low power microcontroller.(L6)
			4601.5	Develop skill in simple program writing for 8051, 8086 & 8085 and applications. (L4,L6)

Year& Sem	Course Code	Course Name	CO's	
III-II	**15A02603**	**POWER SYSTEM ANALYSIS**	2603.1	Infer the concepts of Networks Modeling, and demonstrate the process of Ybus and Zbus formation(L2)
			2603.2	Explain the concepts of per unit values, Analyze the symmetrical faults and unsymmetrical faults and done the fault calculations(L2,L3)
			2603.3	Examine the concepts of Gauss Seidel Algorithm for the given power system network and discover the converged load flow solution(L4)
			2603.4	Examine the concepts of Newton Raphson and Decoupled Algorithms for the given power system network and discover the converged load flow solution(L4)
			2603.5	Inspect the stability of the system and Compare methods to improve the stability(L4)

Year& Sem	Course Code	Course Name	CO's	
III-II	**15A02605**	**PROGRAMMABLE LOGIC CONTROLLER & ITS APPLICATIONS**	2605.1	Able to state the basic plc terminology and their meanings (L2)
			2605.2	Program a PLC for a given application (L2,L6)
			2605.3	Implement Ladder logic for various Industrial applications(L6)
			2605.4	Design control circuits for various applications(L6)
			2605.5	Able to design and program a small ,automated industrial programme (L6)

Year& Sem	Course Code	Course Name	CO's	
III-II	**15A04607**	**MICROPROCESSORS & MICRO CONTROLLERS LAB**	4607.1	Execution of different programs for 8086 in Assembly Level Language using 8086 kit[L3]
			4607.2	Execution of different programs using MSP430 Microcontroller kit.[L3]
			4607.3	Execution of Interrupt programming examples through GPIOs.[L3]
			4607.4	Execution of Low Power modes and Energy trace++[L3]
			4607.5	Design and Implement some specific real time applications[L5]
Year& Sem	Course Code	Course Name	CO's	
III-II	**15A02607**	**POWER ELECTRONICS & SIMULATION LAB**	2607.1	Test the turn on –turn off characteristics of various power electronic devices[L3]
			2607.2	Test and analyze firing circuits for SCRs [L4]
			2607.3	Test different types of voltage controllers, converters and Inverters with R and RL loads [L2]
			2607.4	Analyze the TPS7A4901, TPS7A8300 and TPS54160 buck regulator[L4]
Year& Sem	Course Code	Course Name	CO's	
III-II	**15A52602**	**ADVANCED ENGLISH LANGUAGE COMMUNICATION SKILLS**	2602.1	Develop a wide range of vocabulary to Speak English effectively, and respond appropriately in different socio-cultural and professional contexts. **(L-2 & 3)**
			2602.2	Apply unique qualities of professional writing style such as sentence conciseness, readability, clarity, accuracy, avoiding wordiness or ambiguity, previewing, objectivity, summarizing, coherence and transitional devices. **(L-3)**
			2602.3	Deliver presentations successfully devising and applying various techniques. **(L-2)**
			2602.4	Identify areas of evaluation in GDs as part of the selection procedure, and prepare accordingly and moreover, understand the strategies of the interviewers to facilitate better responses during the Placement interviews. **(L-2)**
			2602.5	Acquire personality traits as self-confidence, positive attitude, emotional intelligence, social grace, flexibility, time management, problem solving, decision making, friendliness and effective communication skills. **(L-2)**

IV B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
IV-I	**15A02701**	**ELECTRICAL DISTRIBUTION SYSTEMS**	2701.1	Compute the various factors associated with power distribution [L2]
			2701.2	Calculate voltage drop calculations in given distribution networks [L3]
			2701.3	Interpret principles of substation maintenance [l2]
			2701.4	Determine power factor improvement for a given system and load [l5]
			2701.5	Understand implementation of SCADA for distribution automation [L2]

Year& Sem	Course Code	Course Name	CO's	
IV-I	**15A04603**	**DIGITAL SIGNAL PROCESSING**	4603.1	Formulate engineering problems in terms of DSP tasks.(L6)
			4603.2	Apply engineering problems solving strategies to DSP problems.(L3)
			4603.3	Design and test DSP algorithms.(L6)
			4603.4	Analyze digital and analog signals and systems.(L4)
			4603.5	Analyze and compare different signal processing strategies.(L4)

Year& Sem	Course Code	Course Name	CO's	
IV-I	**15A02702**	**POWER SYSTEM OPERATION AND CONTROL**	2702.1	Learns the importance of load characteristics and forecasting curves(L2)
			2702.2	Develop the mathematical models of turbines and governors(L6)
			2702.3	Explains the steady state analysis for load frequency control systems(L4)
			2702.4	Explain how shunt and series compensation helps in reactive power control(L4)
			2702.5	Explain the issues concerned with power system operation in competitive environment(L4)

Year& Sem	Course Code	Course Name	CO's	
IV-I	15A02703	UTILIZATION OF ELECTRICAL ENERGY	2703.1	Develop a lighting scheme for a given practical case (L6)
			2703.2	Analyze the performance of Heating and Welding method(L4)
			2703.3	Make all numerical calculations associated with electric traction.(L5)
			2703.4	Acquires knowledge on mechanism on train movement(L2)
			2703.5	Determines the specific energy consumption(L5)

Year& Sem	Course Code	Course Name	CO's	
IV-I	15A02705	SWITCHED MODE POWER CONVERTERS	2705.1	Analyze the operation of various non-isolated DC-DC converters and their associated phenomena.
			2705.2	Analyze the operation of various isolated DC-DC converters and their associated phenomena.
			2705.3	Analyze the operation of ZVS and ZCS resonant DC-DC converters and their associated phenomena.
			2705.4	Formulate dynamic equations for DC-DC converters, Obtain state space and averaged models for the basic DC-DC converters.
			2705.5	Analyze in frequency domain with different P, PI and PID converters

Year& Sem	Course Code	Course Name	CO's	
IV-I	15A02709	POWER QUALITY	2709.1	Identify power quality issues to ensure meeting of standards (L1)
			2709.2	Distinguish the concepts of compensation for sags and swells using voltage regulating device(L2)
			2709.3	Interpret harmonic distortion and its mitigation(L2)
			2709.4	Outline Power quality bench marking and List various Monitoring devices(L1)
			2709.5	Compare power quality enhancement possibilities by custom power devices(L3)

IV B.Tech, I Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
IV-I	15A04608	DIGITAL SIGNAL PROCESSING LABORATORY	4608.1	Capability to generate the random signal using software and hardware(L6)
			4608.2	Capability to find the convolution and correlation of sequences using software and hardware(L5)
			4608.3	Capability to find the FFT of a sequence using software and hardware(L5)
			4608.4	Capability to design FIR filter using software and hardware(L6)
			4608.5	Capability to design IIR filter using software and hardware(L6)
Year& Sem	Course Code	Course Name	CO's	
IV-I	15A02710	POWER SYTEMS & SIMULATION LAB	2710.1	Determines the sequence impedance & subtransient reactane in Synchronous machines(L5)
			2710.2	Analyzes LG, LL, LLG, LLLG faults(L4)
			2710.3	The equivalent circuit of three winding transformer by conducting a suitable experiment(L5)
			2710.4	Developing MATLAB program for formation of Y and Z buses, gauss-seidel and fast decoupled load flow studies(L6)
			2710.5	Developing the SIMULINK model for single area load frequency control problem.(L6)

IV B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
IV-II	**15A02801**	**INSTRUMENTATION**	2801.1	Identify and explain the types of errors occurring in measurement systems(L2)
			2801.2	Differentiate among the types of data transmission and modulation technique(L2)
			2801.3	Apply digital techniques to measure voltage, frequency and speed(L3)
			2801.4	Have a deep understand of instruments which applied to different systems(L4)
			2801.5	Choose suitable transducers for the measurement of non-electrical quantities(L5)

Year& Sem	Course Code	Course Name	CO's	
IV-II	**15A02804**	**HVDC TRANSMISSION**	2804.1	To **Compare** Existing Electrical Transmission Networks with Emerging Transmission Networks namely HVDC and FACTS. (L2)
			2804.2	To **Identify** Various HVDC Links and **Analyze** the Graetz Circuit. (L3 and L4)
			2804.3	To **Construct** the Equivalent Circuits of Rectifier and Inverter.(L6)
			2804.4	To **Inspect** various features of controls like CIA, CEA and CC in HVDC systems. (L4)
			2804.5	To **Summarize** various types of FACTS Controllers and To **Examine** various types of Controllable Series and Shunt VAR generation. (L2 and L4)
			2804.6	To **Discuss** the principle of operation of UPFC and IPFC and To **Construct** their Characteristics. (L6)

Year& Sem	Course Code	Course Name	CO's	
IV-II	**15A02806**	**COMPREHENSIVE VIVA VOCE**	2806.1	To Evaluate the overall knowledge in the core courses learnt in electrical engineering (L6)
			2806.2	To manage placements and be better performers in the future (L4)
			2806.3	To build the learning attitude that is most effective (L1)

IV B.Tech, II Sem EEE COs (R15-JNTUA)

Year& Sem	Course Code	Course Name	CO's	
IV-II	15A02807	TECHNICAL SEMINAR	2807.1	To Inspect research papers in electrical engineering, to summarize and review them. (L-4)
			2807.2	To Assess various latest cutting edge technologies. (L-5)
			2807.3	To Develop skills in preparing detailed report regarding an allotted task. (L-6)
			2807.4	To Utilize the knowledge gained by research papers and exchange a few words by making oral presentation before an assessment team. (L-6)

Year& Sem	Course Code	Course Name	CO's	
IV-II	15A02808	PROJECT WORK	2808.1	Identifying and define the engineering problems and complex problems related to the specific engineering branch [L-1]
			2808.2	Identify, formulate, research literature and analyze complex engineering problems[L-1]
			2808.3	Design/development of solutions and conducts investigations of complex engineering problems [L-6]
			2808.4	Creates, select and apply appropriate techniques , uses modern tools including predictions and limitations [L-6]
			2808.5	Applying, analyzing health safety legal & cultural environmental issues. Applying ethical principles and commit to professional ethics [L-3]
			2808.6	Analyze result, communicate and discuss with team members managing the project and recognize the need for lifelong learning [L-4]

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