



SREEVENKATESWARACOLLEGE OF ENGINEERING

An ISO 9001:: 2015 Certified Institution (Approved by AICTE, New Delhi and Affiliated to JNTU, Anantapur) Northrajapalem (Vi), Kodavaluru (M), S.P.S.R. Nellore (Dt) 524316

Department of Electrical and Electronics Engineering

R20 Regulation

Course Outcomes (COs)

I B.Tech-I Semester

S.No	Subject Name	Subject Code	Course Outcomes	
1	LINEAR ALGEBRA & CALCULUS	20A54101	C111.1	Make use the concepts of Matrices to solve various Engineering problems.
			C111.2	Illustrate the knowledge of Mean Value theorems for engineering applications.
			C111.3	Apply the concepts of maxima and minima for various engineering problems.
			C111.4	Evaluate the Multiple integrals to determine areas and volumes of engineering applications.
			C111.5	Explain the importance of special functions and its applications.
2	APPLIED PHYSICS	20A56201T	C112.1	Interpret the concepts of physical optics like interference, diffraction and polarization in various engineering applications.
			C112.2	Identify the basic concepts of electromagnetic waves and its propagation in optical fibers along with its Engineering applications.
			C112.3	Outline the significant concepts of dielectric and magnetic materials for potential applications in the emerging micro devices.
			C112.4	Analyze the knowledge of basic quantum mechanics and free electron theory of metals to describe the properties of metals.
			C112.5	Demonstrate the physics of semiconductors for electronic devices & concepts of super conducting materials scientific and engineering applications.
3	COMMUNICATIVE ENGLISH	20A52101T	C113.1	Interpret the communication and writing skills in general communication.
			C113.2	Develop the writing and life skills in structural manner of real time scenarios.
			C113.3	Relate the knowledge of writing and speaking skills to enhance the career opportunities.
			C113.4	Illustrate the concepts of writing and speaking skills to develop the skills in job opportunities.
			C113.5	Use the concepts of various real time scenarios to represent in an effective model.

4	FUNDAMENTALS OF ELECTRICAL CIRCUITS	20A02101T	C114.1	Illustrate the concepts of Electrical & Magnetic Circuits& its applications in Electrical Engineering.
			C114.2	understand basic graph theory definitions, loop current method&nodal analysis which are required for solving electrical circuits
			C114.3	Apply the concepts of 1- ϕ AC circuits to solveseries and parallel combinations of electrical circuit elements R, L and C
			C114.4	Distinguish between various theorems and inter-relationship between various theorems
			C114.5	Discuss the advantages of 3- ϕ circuits over 1- ϕ circuits
5	ENGINEERING DRAWING	20A03101T	C115.1	Demonstrate the Principles of Engineering Drawing, BIS Conventions and importance of various curves in engineering for solving engineering problems.
			C115.2	Apply the concepts of Engineering scales for drawing view Of projection points of a problem.
			C115.3	Analyze the procedure of projection of lines and regular Plane surfaces for development of engineering models.
			C115.4	Construct the development of surfaces by understanding the projection of solids concept.
			C115.5	Understand the meaning of development of surfaces & regular solids
6	ENGINEERING GRAPHICS LAB	20A03101P	C116.1	Develop the engineering imagination essential for successful design.
			C116.2	Select the utility of drafting & modeling packages in orthographic and isometric drawings.
			C116.3	Apply the usage of 2D and 3D modeling.
7	APPLIED PHYSICS LAB	20A56201P	C117.1	Understand the importance of optical phenomenon like Interference, diffraction and dispersion
			C117.2	Comprehend the importance of optical fiber parameters in communication
			C117.3	Recognize the importance of energy gap in the study of conductivity and Hall Effect in a semiconductor.
			C117.4	Recognize the importance of Hysteresis loop of ferro magnetic materials
8	COMMUNICATIVE ENGLISH LAB	20A52101P	C118.1	To remember and understand the different aspects of the English language proficiency with emphasis on LSRW skills
			C118.2	To analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
			C118.3	To evaluate and exhibit acceptable etiquette essential in social and professional settings .

9	FUNDAMENTALS OF ELECTRICAL CIRCUITS LAB	20A02101P	C119.1	Apply suitable theorems for circuit analysis and verify the results theoretically.
			C119.2	Determine the Coefficient of Coupling for Self, Mutual Inductances and verify the results theoretically.
			C119.3	Determine the active and reactive powers experimentally and verify the results theoretically.

HOD-EEE

I B.Tech-II Semester

S.No	Subject Name	Subject Code	Course Outcomes	
1	DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS	20A54201	C121.1	Apply the mathematical knowledge of higher-order differential equations to solve various engineering problems.
			C121.2	Solve the linear differential equations with constant coefficients by the appropriate method
			C121.3	Identify solution methods for partial differential equations that model physical processes.
			C121.4	Illustrate the physical interpretation of Gradient, Divergence and Curl.
			C121.5	Apply Green's, Stokes and Divergence theorem in evaluation of double and triple integrals.
2	CHEMISTRY	20A51101T	C122.1	Outline the molecular orbital energy level diagram of different molecular species.
			C122.2	Explain the band theory of solids for conductors, semiconductors and insulators
			C122.3	Acquire the knowledge of electrochemistry to improve the efficiency of batteries
			C122.4	Demonstrate the various preparation mechanisms of different polymers in engineering applications
			C122.5	Illustrate the various spectroscopic techniques used for the identification of functional groups and applications of chemical compounds.
3	C-PROGRAMMING & DATA STRUCTURES	20A05201T	C123.1	Understand the basic concepts of C Language to frame the C programs.
			C123.2	Apply String handling functions and pointers.
			C123.3	Apply the knowledge of stacks and queues for various applications.
			C123.4	Apply the knowledge of arrays and linked lists for various applications.
			C123.5	Develop the tree and graph models of the given problem through tree and graph concepts
4	ELECTRONIC DEVICES & CIRCUITS	20A04101T	C124.1	Illustrate the operating principles of P-N Diode & special purpose electronic devices.
			C124.2	Demonstrate the working principle of rectifiers & filters
			C124.3	Interpret the working principle and characteristics of transistors.
			C124.4	Analyze the biasing techniques of BJT and FET
			C124.5	Analyze the BJT & FET amplifier circuits using small signal model.
	ENGINEERING WORKSHOP	20A03202	C125.1	Apply wood working skills in real world applications

5			C125.2	Build different parts with metal sheets in real world applications
			C125.3	Apply fitting operations in various applications
			C125.4	Demonstrate soldering and brazing
			C125.5	Apply different types of basic electric circuit connections
6	IT WORKSHOP	20A05202	C126.1	Demonstrate and Analyze the Block diagram of a computer.
			C126.2	Build a Personal Computer and Install operating systems and prepare the computer ready to use.
			C126.3	Develop presentation and documentation of a given task through Microsoft Windows and access the Internet & test Interconnect two or more computers for information sharing.
7	C-PROGRAMMING & DATA STRUCTURES LAB	20A05201P	C127.1	Design programs by selecting the right identifiers, data types & operators, control statements, arrays and strings for effective Computation.
			C127.2	Develop searching and sorting algorithms.
			C127.3	Illustrate the working of stack and queue.
8	CHEMISTRY LAB	20A51101P	C128.1	Demonstrate the cell constant and conductance of solutions.
			C128.2	Interpret the strength of an acid present in secondary batteries.
			C128.3	Demonstrate advanced polymer materials are used in engineering applications.
9	ELECTRONIC DEVICES & CIRCUITS LAB	20A04101P	C129.1	Explain the characteristics and Applications of Diodes, BJT and FET under different configurations
			C129.2	Analyze the performance of various rectifiers with filters.
			C129.3	Analyze the performance of various amplifiers with BJT and FET.
10	ENVIRONMENTAL SCIENCE	20A99201	C12A0.1	Describe the knowledge of natural resources and their importance in our daily life to develop & apply various water conservation methods of natural resources.
			C12A0.2	Illustrate the importance of ecosystem and its functions in environmental education for protection of life cycles of various bio systems which are essential for biosphere.
			C12A0.3	Demonstrate the knowledge of different types of pollutions and their control & impact on global environment which may affect the human health.
			C12A0.4	Identify the various environmental impacts and the importance of various acts and policies towards environmental sustainability.
			C12A0.5	Analyze the effects of increasing human population as well as health associated problems and learn measures to be taken to protect human health.

HOD-EEE

IIB.Tech-I Semester

S.No	Subject Name	Subject Code	Course Outcomes	
1	COMPLEX VARIABLES AND TRANSFORMS	20A54302	C211.1	Identify the analyticity of complex functions and understand the conformal mappings of complex functions.
			C211.2	Apply Cauchy's integral formula and Cauchy's integral theorem to evaluate improper integrals along contours.
			C211.3	Make use the concepts of Laplace transform and inverse Laplace transform in solving Differential Equations arising in engineering field.

			C211.4	Demonstrate Fourier series to study the behavior of periodic function and their applications in various fields of engineering.
			C211.5	Apply the properties of Fourier transforms and Z transforms to solve various engineering problems.
2	ELECTRICAL CIRCUIT ANALYSIS	20A02301T	C212.1	Analyze AC circuits along with resonance and locus diagrams.
			C212.2	Relate network topology for analyzing the circuit.
			C212.3	Illustrate the transient response of R-L, R-C, R-L-C circuits for D.C. and A.C. excitation.
			C212.4	Apply Fourier transforms to electrical circuits excited by non-sinusoidal sources.
			C212.5	Demonstrate different types of filters to study their characteristics.
3	DC MACHINES & TRANSFORMERS	20A02302T	C213.1	Summarize various magnetic materials, their properties and applications and to Describe the Electromechanical Energy Conversion.
			C213.2	Describe the construction, operation a DC generator and to Illustrate the characteristics of DC generators.
			C213.3	Describe the speed control, testing methods of DC Motors and parallel operation of DC machines and to Illustrate the characteristics of DC motors.
			C213.4	Describe the construction, operation and parallel operation of transformers and to Compute the efficiency and regulation of a transformer.
			C213.5	Summarize the phase conversions and to Describe the tap changing of transformers.
4	DIGITAL LOGIC DESIGN	20A02403T	C214.1	Be able to manipulate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray, and BCD.
			C214.2	Be able to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
			C214.3	Be able to design and analyze small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.
			C214.4	Be able to design and analyze small sequential circuits and devices
			C214.5	Be able to use standard sequential functions/building blocks to build larger more complex circuits.
5	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	20A52301	C215.1	Analyze the Elasticity and degree of elasticity
			C215.2	Apply the least-cost combination of inputs
			C215.3	Analyze the optimum output levels to maximize profit in different markets
			C215.4	Summarize the Contrast and compare different investment appraisal methods
			C215.5	Outline the financial performance of an enterprise by using financial statements

6	ELECTRICAL CIRCUIT ANALYSIS LAB	20A02301P	C216.1	Design the electrical circuit concepts by interpreting the simulation results.
			C216.2	Evaluate three phase active and reactive power of three phase balanced loads using PSPICE software.
			C216.3	Analyze the RL, RC and RLC series circuits for a specified transient response using PSPICE software
7	DC MACHINES & TRANSFORMERS LAB	20A02302P	C217.1	Determine the magnetization and load characteristics of a DC shunt generator.
			C217.2	Describe the efficiency and performance characteristics of a dc motors
			C217.3	Predetermination of transformer with different loads
8	DIGITAL LOGIC DESIGN LAB	20A04303P	C218.1	Understand the pin configuration of various digital ICs used in the lab
			C218.2	Analyze the sequential and combinational circuits.
			C218.3	Design of any sequential/combinational circuit using Hardware/ HDL.
9	APPLICATION DEVELOPMENT WITH PYTHON	20A05305	C219.1	Apply the features of python language in various real applications.
			C219.2	Design object oriented programs using python for solving real world problems
			C219.3	Apply modularity to programs
10	UNIVERSAL HUMAN VALUES	20A52201	C21A0.1	To develop a holistic perspective based on self-exploration about themselves (human being), family, society and nature/existence.
			C21A0.2	To understand (or developing clarity) the harmony in the human being, family, society and nature/existence
			C21A0.3	To strengthen self-reflection.

HOD-EEE

II B.Tech -II Semester

S.No	Subject Name	Subject Code	CourseOutcomes	
	NUMERICAL METHODS & PROBABILITY THEORY	20A54402	C221.1	Solve algebraic and transcendental equations by using numerical methods.
			C221.2	Estimate Phenomena value by using interpolation techniques.

1			C221.3	Solve the ordinary differential equations and integration through numerical differentiation and integration.
			C221.4	Apply the probability basic concepts to predict the information about data.
			C221.5	Evaluate expected mean lifetime, failure rates, and service rates of equipment by using probability distribution.
2	ANALOG ELECTRONIC CIRCUITS	20A04404T	C222.1	Analyze the parameters of multi stage amplifiers.
			C222.2	Illustrate the concept of negative feedback on amplifier characteristics and different oscillators.
			C222.3	Compute the parameters of various large signal amplifiers.
			C222.4	Interpret the characteristics and applications of operational amplifier.
			C222.5	Design the linear applications of an op-amp.
3	POWER ELECTRONICS	20A02401T	C223.1	Distinguish the types of power semiconductor devices and analyze their switching characteristics.
			C223.2	Demonstrate the operation of controlled rectifiers, and analyze its characteristics and the performance parameters.
			C223.3	Differentiate the switching techniques and basics topologies of DC-DC switching regulators.
			C223.4	Apply the different modulation techniques to pulse width modulated inverters to identify the suitable harmonic reduction methods for the applications.
			C223.5	Demonstrate the operation of AC voltage controller and cyclo-converters differentiate their various configurations in AC-AC applications.
4	AC MACHINES	20A02402T	C224.1	Summarize the windings, factors effect and magnetic fields for AC Machine.
			C224.2	Illustrate the construction, working, performance characteristics and starting methods of a three phase Induction motor.
			C224.3	Analyze the various regulation methods and Parallel Operation in three phase synchronous generators.
			C224.4	Discuss the operation, performance characteristics and hunting methods of three phase synchronous motor.
			C224.5	Choose the 1-phase motors used for various domestic and industrial applications.
5	ELECTROMAGNETIC FIELD THEORY	20A02403T	C225.1	Demonstrate the laws and the equations concerned with static electric fields for design of Electrostatic models.
			C225.2	Choose the behavior of conductors and dielectrics in electric fields for selecting suitable material for various applications.
			C225.3	Analyze the equations concerned with static magnetic fields for the design of Magnetostatic models
			C225.4	Evaluate the inductance of various configurations to choose suitable inductor for applications.

			C225.5	Apply Maxwell's equation to solve the problems related to transmission lines & uniform plane wave propagation.
6	ANALOG ELECTRONIC CIRCUITS LAB	20A04404P	C226.1	Analyze various amplifier circuits.
			C226.2	Design OPAMP based analog circuits.
			C226.3	Design and implement Combinational and Sequential logic circuits
7	POWER ELECTRONICS LAB	20A02401P	C227.1	Determine the turn on – turn off characteristics of various power electronic devices.
			C227.2	Sketch the characteristics of voltage controllers, converters and inverters with R and RL loads
			C227.3	Analyze the performance characteristics of SCR, single phase ac voltage controller, DC Jones chopper and series inverter using MATLAB
8	AC MACHINES LAB	20A02402P	C228.1	Determine the efficiency of a single phase and three phase induction motors
			C228.2	Determine the voltage regulation of synchronous generator.
			C228.3	Analyze the characteristics of synchronous machine with different excitations
9	CIRCUITS SIMULATION & ANALYSIS USING PSPICE	20A02404	C229.1	Simulation of various circuits using PSPICE software.
			C229.2	Simulation of single-phase half & fully-controlled converters, and inverters
			C229.3	Simulation of single-phase AC Voltage controllers with different loads.
10	DESIGN THINKING FOR INNOVATION	20A99401	C22A0.1	Define the concepts related to design thinking.
			C22A0.2	Explain the fundamentals of Design Thinking and innovation
			C22A0.3	Apply the design thinking techniques for solving problems in various sectors

HOD-EEE

III B.Tech-I Semester

S.No	Subject Name	Subject Code	Course Outcomes
	POWER SYSTEM ARCHITECTURE	20A02501	C311.1 Illustrate the concepts and operation thermal, hydro and nuclear power station to generate power.

1			C311.2	Compute the transmission line parameters using GMD and GMR.
			C311.3	Summarize the performance of short, medium and long transmission lines.
			C311.4	Discusses different types of Insulators, Mechanical Design Of Lines And Cables
			C311.5	Compare DCvs AC and Under-Ground vs Over - Head Distribution Systems, types of Distribution Systems.
2	CONTROL SYSTEMS	20A02502T	C312.1	Analyze the differential equations for mechanical and electrical systems and obtain the transfer function from block diagrams, servo motors and signal flow graphs
			C312.2	Analyze the time domain specifications, steady state errors and to learn time response analysis of first and second order systems
			C312.3	Summarize the concepts Routh's stability and Root locus to find the stability of the system
			C312.4	Summarize the frequency domain specifications from Bode, Polar, Nyquist plots and evaluate the frequency domain specifications.
			C312.5	Summarize the concept of state space analysis, controllability and Observability and to obtain the transfer function.
3	MEASUREMENTS & SENSORS	20A02503T	C313.1	Describe the concepts and principles of Measuring Instruments to measure the voltage and current.
			C313.2	Illustrate the working principles of single phase, three phase wattmeters, energy meter to measure power and energy in circuits.
			C313.3	Illustrate the working principles of single phase, three phase wattmeters, energy meter to measure power and energy in circuits.
			C313.4	Determine the resistance, inductance and Capacitance for AC and DC bridges.
			C313.5	Analyze the concepts of Digital Measuring Instruments to measure voltage and current.
4	SWITCHGEAR AND PROTECTION	20A02504A	C314.1	Demonstrate the concepts and principle of Circuit Breakers for power system protection.
			C314.2	Illustrate the operation of electromagnetic, Static and Microprocessor based relays for sensing the faults .
			C314.3	Summarize the various protection methods for generators and transformers.
			C314.4	Interpret the protective schemes for feeders and transmission lines .
			C314.5	Describe the generation and protection of over voltages in power systems .

5	OPTIMIZATION TECHNIQUES	20A54501	C315.1	Formulate a linear programming problem and solve it by various methods
			C315.2	Calculate an optimal solution in assignment jobs
			C315.3	Summarize various process of transportation of items from sources to destinations.
			C315.4	Explain the process of identification strategies in a game for optimal profit.
			C315.5	Understand the process of implementation of project planning.
6	CONTROL SYSTEMS LAB	20A02502P	C316.1	Evaluate the characteristics of AC servomotors, DC servo motors, magnetic amplifier and synchros.
			C316.2	Determine the error obtained in control system with the effect of P, PI, PID controllers.
			C316.3	Calculate the stability of a Bode plot, Root locus, Nyquist of Linear time invariant systems using MATLAB.
7	MEASUREMENTS & SENSORS LAB	20A02503P	C317.1	Calibrate single phase Energy meter, Power Factor meter, Ammeter and Voltmeter.
			C317.2	Determine the values of Resistance, Inductance and Capacitance using Kelvin's , Anderson's and Schering Bridges
			C317.3	Determine the values of Choke coil Parameters using 3 voltmeter and 3 Ammeter methods.
8	SOFT SKILLS	20A52401	C318.1	Summarize various elements of effective communicative skills
			C318.2	Apply critical thinking skills in problem solving
			C318.3	Develop social and work-life skills as well as personal and emotional well-being
9	EVALUATION OF COMMUNITY SERVICE PROJECT	20A02505	C319.1	Summarize the fundamental engineering knowledge of science and engineering domain
			C319.2	Demonstrate the knowledge of basic science and engineering applications.
			C319.3	Analyze the critical problem solving ability of a given application.

HOD-EEE

III B.Tech-II Semester

S.No	Subject Name	Subject Code	CourseOutcomes(COs)	
	POWER SYSTEM ANALYSIS	20A02601T	C321.1	Construct Y bus matrix for the given power system network.
			C321.2	Analyze contingency analysis for power system networks using Z Bus method.

1			C321.3	Interpret Power Flow solutions using Gauss Seidel Method for given power system network.
			C321.4	Demonstrate Short circuit analysis of a power system.
			C321.5	Classify types of stabilities and its improvements of a given power system.
2	DIGITAL COMPUTING PLATFORMS	20A02602T	C322.1	Design the 8086 Microprocessor with Assembling language programming and interfacing with various modules
			C322.2	Understand the Interfacing of 8086 with various advanced communication devices
			C322.3	Designing of 8051 Microcontroller with Assembling language programming and interfacing with various modules
			C322.4	To know about Assembly Language Programs for the Digital Signal Processors and usage of Interrupts
			C322.5	To understand Xilinx programming and understanding of Spartan FPGA board
3	DIGITAL SIGNAL PROCESSING	20A04502T	C323.1	Computethe timeresponseandfrequencyresponseof DiscreteFourier Transforms.
			C323.2	Analyze the concepts of Fast Fourier Transform Algorithms.
			C323.3	Demonstratetheprinciplesofrealizationtechniquesof FIR&IIRfilters.
			C323.4	DesigntheFIRfiltersandIIRfilters.
			C323.5	Illustrate the concepts ofMulti rate Digital Signal Processing.
4	HVDC AND FACTS	20A02604A	C324.1	Describe the limitations of conventional transmission systems.
			C324.2	Develop the equivalent circuit of HVDC link.
			C324.3	Describe various methods for the control of HVDC systems.
			C324.4	Analyze the circuits of shunt, VAR, series configurations.
			C324.5	Analyze the transmission control strategies.
5	INTRODUCTION TO INTERNET OF THINGS	20A04701B	C325.1	Understand the concepts of Internet of Things
			C325.2	Identify hardware and software components of Internet of Things
			C325.3	Analyze basic communication protocols
			C325.4	Design IoT applications in different domain
			C325.5	Analyze the performance of IOT in different domains

6	POWER SYSTEMS ANALYSIS LAB	20A02601P	C326.1	Calculate the sequence impedances, sub-transient reactance, symmetrical and unsymmetrical faults of synchronous machine
			C326.2	Determine the parameters of equivalent circuit of three winding transformer.
			C326.3	Develop a MATLAB program for formation of Ybus, Zbus and Gauss seidel ,Fast decoupled load flow studies.
7	DIGITAL COMPUTING PLATFORMS LAB	20A02602P	C327.1	Design and implement programs on 8086 microprocessor.
			C327.2	Demonstrate the concepts related to I/O and memory interfacing
			C327.3	Analyze interfacing and programming of GPIO ports in C using MSP430
8	DIGITAL SIGNAL PROCESSING LAB	20A04502P	C328.1	Analyze discrete time signals & systems using MATLAB
			C328.2	Design IIR & FIR filters, DSP based real time processing systems to meet desired needs of the society
			C328.3	Implement DSP algorithms using digital signal processors.
9	APPLICATIONS OF SOFT COMPUTING TOOLS IN ELECTRICAL ENGINEERING	20A02606	C329.1	Understand the basic concepts of Electrical Engineering
			C329.2	Apply the concepts to design MATLAB models.
			C329.3	Analyze various Electrical engineering applications through MATLAB.
10	INTELLECTUAL PROPERTY RIGHTS & PATENTS	20A99601	C32A0.1	Illustrate the basics of Intellectual Property Rights, Copy Right Laws
			C32A0.2	Understand IPR law & Cyber law
			C32A0.3	Discuss registration process, maintenance and litigations associated with trademarks
			C32A1.4	Illustrate the copy right law
			C32A1.5	Explain the trade secret law

HOD-EEE