

Department of Electronical and Electronics Engineering

Program Outcomes and Course Outcomes

Program Outcomes (POs)
PO1: Apply knowledge of computing fundamentals, computing specialization, mathematics and domain knowledge to provide IT solutions.
PO2: Identify, analyze and solve IT problems using fundamental principles of mathematics and computing sciences.
PO3: Design, Develop and evaluate software solutions to meet societal and environmental concerns.
PO4: Conduct investigations of complex problems using research based knowledge and methods to provide valid conclusions.
PO5: Select and apply appropriate techniques and modern tools for complex computing activities.
PO6: Practice and follow professional ethics and cyber regulations.
PO7: Involve in life-long learning for continual development as an IT professional.
PO8: Apply and demonstrate computing and management principles to manage projects in multidisciplinary environments by involving in different roles.
PO9: Comprehend& write effective reports and make quality presentations.
PO10: Understand and assess the impact of IT solutions on socio-environmental issues.
PO11: Work collaboratively as a member or leader in multidisciplinary teams.
PO12: Identify potential business opportunities and innovate to create value to the society and seize that opportunity.
Program Specific Outcomes (PSOs)
PSO1: Analyze and design electrical machines and power systems.
PSO2: Understand Generation, Transmission, Distribution and Utilization of Electric power
PSO3: Design analog and digital electronic circuits and controller for operation and maintenance of electrical systems

Course Outcomes:

Year/ Semester: 2 nd Year /4 th Semester		Scheme of Study: 18-Scheme
Course Name : ELECTRICAL MACHINES LABORATORY		Course Code: 18EEL47
CO1	Test DC machines to determine their characteristics and also to control the speed of DC motor.	
CO2	Pre-determine the performance characteristics of DC machines by conducting suitable tests.	
CO3	Perform load test on single phase and three phase induction motor to assess its performance.	
CO4	Conduct test on induction motor to pre-determine the performance characteristics.	
CO5	Conduct test on synchronous motor to draw the performance curves.	

Year/Semester: 2 nd Year /4 th Semester		Scheme of Study: 18-Scheme
Course Name : ELECTRIC MOTORS		Course Code: 18EE44
CO1	Explain the construction, operation and classification of DC Motor, AC motor and Special purpose motors.	
CO2	Explain the construction, operation and classification of DC Motor, AC motor and Special purpose motors.	
CO3	Demonstrate and explain the methods of testing of DC machines and determine losses and efficiency.	
CO4	Control the speed of DC motor and induction motor.	
CO5	Explain the starting methods, equivalent circuit and phasor diagrams, torque angle, effect of change in excitation and change in load, hunting and damping of synchronous motors.	

Year/ Semester: 2 nd Year /4 th Semester		Scheme of Study: 18-Scheme
Course Name : ELECTRO MAGNETIC FIELD THEORY		Course Code: 18EE45
CO1	Use different coordinate systems, Coulomb's Law and Gauss Law for the evaluation of electric fields produced by different charge configurations.	
CO2	Calculate the energy and potential due to a system of charges & Explain the behavior of electric field across a boundary conditions.	
CO3	Explain the Poisson's, Laplace equations and behavior of steady magnetic fields.	
CO4	Explain the behavior of magnetic fields and magnetic materials.	
CO5	Asses time varying fields and propagation of waves in different media.	

Year/ Semester: 2nd Year /4th Semester		Scheme of Study: 18-Scheme
Course Name : Complex Analysis Probability And Statistical Methods		Course Code: 18MAT41
CO1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.	
CO2	Utilize conformal transformation and complex integral arising in aero foil theory, fluid flow visualization and image processing.	
CO3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.	
CO4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.	
CO5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.	

Year/ Semester: 2nd Year /4th Semester		Scheme of Study: 18-Scheme
Course Name : Op-Amp & Linear IC'S Laboratory		Course Code: 18EEL48
CO1	To conduct experiment to determine the characteristic parameters of OP-Amp.	
CO2	To design test the OP-Amp as Amplifier, adder, subtractor, differentiator and integrator.	
CO3	To design test the OP-Amp as oscillators and filters.	
CO4	Design and study of Linear IC's as multi vibrator power supplies.	

Year/ Semester: 2nd Year /4th Semester		Scheme of Study: 18-Scheme
Course Name : Operational Amplifiers & Linear IC'S		Course Code: 18EE46
CO1	Describe the characteristics of ideal and practical operational amplifier.	
CO2	Design filters and signal generators using linear ICs.	
CO3	Demonstrate the application of Linear ICs as comparators and rectifiers.	
CO4	Analyze voltage regulators for given specification using op-amp and IC voltage regulators.	
CO5	Summarize the basics of PLL and Timer.	

Year/ Semester: 2nd Year /4th Semester		Scheme of Study: 18-Scheme
Course Name : Power Generation And Economics		Course Code: 18EE42
CO1	Describe the working of hydroelectric, steam, nuclear power plants and state functions of major equipment of the power plants.	
CO2	Classify various substations and explain the functions of major equipment in substations.	
CO3	Explain the types of grounding and its importance.	

CO4	Infer the economic aspects of power system operation and its effects.
CO5	Explain the importance of power factor improvement.

Year/ Semester: 2 nd Year /4 th Semester		Scheme of Study: 18-Scheme
Course Name : Transmission & Distribution		Course Code: 18EE43
CO1	Explain transmission and distribution scheme, identify the importance of different transmission systems and types of insulators.	
CO2	Analyze and compute the parameters of the transmission line for different configurations.	
CO3	Assess the performance of overhead lines.	
CO4	Interpret corona, explain the use of underground cables.	
CO5	Classify different types of distribution systems; examine its quality & reliability.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : Management And Entrepreneurship		Course Code: 18EE51
CO1	Are you able to explain the field of management, task of the manager, planning and steps in decision making.	
CO2	Are you able to discuss the structure of organization, importance of staffing, leadership styles, modes of communication, techniques of coordination and importance of managerial control in business.	
CO3	Are you able to explain the concepts of entrepreneurship and a businessman's social responsibilities towards different groups.	
CO4	Are you able to show an understanding of role of ssi's in the development of country and state/central level institutions/agencies supporting business enterprises.	
CO5	Are you able to discuss the concepts of project management, capital budgeting, project feasibility studies, need for project report and new control techniques.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : Microcontroller		Course Code: 18EE52
CO1	Are you able to outline the 8051 architecture, registers, internal memory organization, addressing modes.	
CO2	Are you able to discuss 8051 addressing modes, instruction set of 8051, accessing data and i/o port programming.	
CO3	Are you able to develop 8051c programs for time delay, i/o operations, i/o bit manipulation, logic and arithmetic operations, data conversion and timer/counter programming.	
CO4	Are you able to summarize the basics of serial communication and interrupts, also develop 8051 programs for serial data communication and interrupt programming.	
CO5	Are you able to program 8051 to work with external devices for adc, dac, stepper motor control, dc motor control, elevator control.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : POWER ELECTRONICS		Course Code: 18EE53
CO1	Are you able to give an overview of applications power electronics, different types of power semiconductor devices, their switching characteristics, power diode characteristics, types, their operation and the effects of power diodes on rl circuits.	
CO2	Are you able to explain the techniques for design and analysis of single phase diode rectifier circuits.	
CO3	Are you able to explain different power transistors, their steady state and switching characteristics and limitations?	
CO4	Are you able to explain different types of thyristors, their gate characteristics and gate control requirements.	
CO5	Are you able to explain the design, analysis techniques, performance parameters and characteristics of controlled rectifiers, dc- dc, dc -ac converters and voltage controllers.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : SIGNALS AND SYSTEMS		Course Code: 18EE54
CO1	Are you able to Explain the generation of signals, behavior of system and the basic operations that can be performed on signals and properties of systems.	
CO2	Are you able to Apply convolution in both continuous and discrete domain for the analysis of systems given impulse response of a system.	
CO3	Are you able to Solve the continuous time and discrete time systems by various methods and their representation by block diagram.	
CO4	Are you able to Perform Fourier analysis for continuous and discrete time, linear time invariant systems.	
CO5	Are you able to Apply Z-transform and properties of Z transform for the analysis of discrete time systems.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : ELECTRICAL MACHINE DESIGN		Course Code: 18EE55
CO1	Are you able to identify and list, limitations, modern trends in design, manufacturing of electrical machines and properties of materials used in the electrical machines?	
CO2	Are you able to derive the output equation of dc machine, discuss selection of specific loadings and magnetic circuits of dc machines, design the field windings of dc machine, and design stator and rotor circuits of a dc machine?	
CO3	Are you able to derive the output equations of transformer, discuss selection of specific loadings, and estimate the number of cooling tubes, no load current and leakage reactance of core type transformer?	
CO4	Are you able to develop the output equation of induction motor, discuss selection of specific loadings and magnetic circuits of induction motor, design stator and rotor circuits of a induction motor.	
CO5	Are you able to formulate the output equation of alternator, design the field windings of synchronous machine, discuss short circuit ratio and its effects on performance of synchronous machines, design salient pole and non-salient pole alternators for given specifications.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : HIGH VOLTAGE ENGINEERING		Course Code: 18EE56
CO1	Are you able to Explain conduction and breakdown phenomenon in gases, liquid dielectrics and breakdown phenomenon in solid di electrics?	
CO2	Are you able to Summarize generation of high voltages and currents?	
CO3	Are you able to Outline measurement techniques for high voltages and currents?	
CO4	Are you able to Summarize overvoltage phenomenon and insulation coordination in electric power systems?	
CO5	Are you able to Explain non-destructive testing of materials and electric apparatus, high-voltage testing of electric apparatus.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : MICROCONTROLLER LABORATORY		Course Code: 18EEL57
CO1	Are you able to write assembly language programs for data transfer, arithmetic, Boolean and logical instructions and code conversions?	
CO2	Are you able to write alp using subroutines for generation of delays, counters, configuration of sfrs for serial communication and timers?	
CO3	Are you able to perform interfacing of stepper motor and dc motor for controlling the speed, elevator, lcd, external adc and temperature control.	
CO4	Are you able to generate different waveforms using dac interface.	
CO5	Are you able to work with a small team to carryout experiments using microcontroller concepts and prepare reports that present lab work.	

Year/ Semester: 3 rd Year /5 th Semester		Scheme of Study: 18-Scheme
Course Name : POWER ELECTRONICS LABORATORY		Course Code: 18EEL58
CO1	Are you able to obtain static characteristics of semiconductor devices to discuss their performance.	
CO2	Are you able to trigger the scr by different methods.	
CO3	Are you able to verify the performance of single phase controlled full wave rectifier and ac voltage controller with r and rl loads.	
CO4	Are you able to control the speed of a dc motor, universal motor and stepper motors.	
CO5	Are you able to verify the performance of single phase full bridge inverter connected to resistive load.	

Year/ Semester: 3 rd Year /6 th Semester		Scheme of Study: 18-Scheme
Course Name : Control Systems		Course Code: 18EE61
CO1	Are you able to analyze and modern electrical and mechanical system using analogous.	

CO2	Are you able to formulate transfer functions using block diagram and signal flow graph.
CO3	Are you able to analyze system response and evaluate error dynamics in time domain?
CO4	Are you able to apply RH criteria, Root locus, Bode plot and Nyquist Techniques?
CO5	Are you able to design controller and compensator?

Year/ Semester: 3rd Year /6th Semester		Scheme of Study: 18-Scheme
Course Name : Power System Analysis– 1		Course Code: 18EE62
CO1	Are you able to design the power system components and construct per unit impedance diagram of power system.	
CO2	Are you able to analyze three phase symmetrical faults on power system.	
CO3	Are you able to calculate unbalanced phasors in terms of sequence components and vice-versa and also develop sequence networks.	
CO4	Are you able to evaluate various unsymmetrical faults on power system.	
CO5	Are you able to analyze the dynamics of synchronous machines and power system stability.	

Year/ Semester: 3rd Year /6th Semester		Scheme of Study: 18-Scheme
Course Name : Digital Signal Processing		Course Code: 18EE63
CO1	Are you able to a DFT and IDFT to perform linear filtering techniques on given sequences to determine the output.	
CO2	Are you able to implement fast efficient algorithms for computing DFT and IDFT of a given sequence.	
CO3	Are you able to design and realize IIR Butterworth and Chebyshev Digital filters using impulse invariant and Bi linear transformations.	
CO4	Are you able to design a digital IIR & FIR filters by direct, cascade, parallel & ladder realization methods.	
CO5	Are you able to realize FIR filters using window function and frequency sampling method.	

Year/ Semester: 3rd Year /6th Semester		Scheme of Study: 18-Scheme
Course Name : Sensors and Transducers		Course Code: 18EE647
CO1	Are you able to apply gauges and transducers to measure pressure, direction and distance.	
CO2	Are you able to understand the use of light transducers and other devices used for measurement of electromagnetic radiation.	
CO3	Are you able to analyze the working principle of temperature sensing devices.	
CO4	Are you able to apply audio electrical transducers and sensors used for the measurement of sound.	

CO5	Are you able to understand the use of sensors for the measurement of mass, volume and environmental qualities.
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Year/ Semester: 3 rd Year /6 th Semester		Scheme of Study: 18-Scheme
Course Name : Non-Conventional Energy Sources		Course Code: 18ME651
CO1	Are you able to Describe the environmental aspects of non-conventional energy resources. In comparison with various conventional energy system, their prospects and limitations.	
CO2	Are you able to compare Solar, wind and bio energy systems, their prospects, advantages and limitations.	
CO3	Are you able to describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, drying and cooking etc.	
CO4	Are you able to know the need of renewable energy sources, historical and latest developments.	
CO5	Are you able to appreciate the need of wind energy and the various components used in energy generation and know the classification.	

Year/ Semester: 3 rd Year /6 th Semester		Scheme of Study: 18-Scheme
Course Name : Control System Laboratory		Course Code: 18EEL66
CO1	Are you able to utilize software package and discrete components in assessing the time and frequency domain response of a given second order system.	
CO2	Are you able to Design, analyze and simulate Lead, Lag and Lag – Lead compensators for given specifications.	
CO3	Are you able to analyze the performance characteristics of ac and DC servomotors and synchro-transmitter receiver pair used in control systems.	
CO4	Are you able to Simulate the DC position and feedback control system to study the effect of P, PI, PD and PID controller and Lead compensator on the step response of the system.	
CO5	Are you able to compute a script files to plot Root locus, Bode plot and Nyquist plot to study the stability.	

Year/ Semester: 4 th Year /7 th Semester		Scheme of Study: 18-Scheme
Course Name : POWER SYSTEM ANALYSIS– 2		Course Code: 18EE71
CO1	Are you able to Formulate network matrices and models for solving load flow problems.	
CO2	Are you able to Perform steady state power flow analysis of power systems using numerical iterative techniques.	
CO3	Are you able to Solve issues of economic load dispatch and unit commitment problems.	
CO4	Are you able to Analyze short circuit faults in power system networks using bus impedance matrix.	

CO5	Are you able to Apply Point by Point method and Runge Kutta Method to solve Swing Equation.
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Year/ Semester: 4 th Year /7 th Semester		Scheme of Study: 18-Scheme
Course Name : Power System Protection		Course Code: 18EE72
CO1	Are you able to analyze performance of protective relays, components of protection scheme and relay terminology over current protection.	
CO2	Are you able to Explain the working of distance relays and the effects of arc resistance, power swings, line length and source impedance on performance of distance relays.	
CO3	Are you able to analyze pilot protection, construction, operating principles and performance of differential relays and discuss protection of generators, motors, transformer and Bus Zone Protection.	
CO4	Are you able to analyze the construction and operation of different types of circuit breakers. Outline features of fuse, causes of over voltages and its protection, also modern trends in Power System Protection.	
CO5	Are you able to analyze the Outline features of fuse, causes of over voltages and its protection, also modern trends in Power System Protection.	

Year/ Semester: 4 th Year /7 th Semester		Scheme of Study: 18-Scheme
Course Name : Solar And Wind Energy		Course Code: 18EE731
CO1	Are you able to Discuss the importance of the role of renewable energy, the concept of energy storage and the principles of energy storage devices.	
CO2	Are you able to Discuss the concept of solar radiation data and solar PV system fabrication, operation of solar cell, sizing and design of PV system.	
CO3	Are you able to Describe the process of harnessing solar energy and its applications in heating and cooling.	
CO4	Are you able to Explain basic Principles of Wind Energy Conversion, collection of wind data, energy estimation and site selection.	
CO5	Are you able to Discuss the performance of Wind-machines, energy storage, applications of Wind Energy and environmental aspects.	

Year/ Semester: 4 th Year /7 th Semester		Scheme of Study: 18-Scheme
Course Name : Industrial Drives And Application		Course Code: 18EE741
CO1	Are you able to explain the advantages, choice and control of electric drive.	
CO2	Are you able to explain the dynamics, generating and motoring modes of operation of electric drives.	
CO3	Are you able to explain the selection of motor power rating to suit industry requirements.	
CO4	analyze the performance & control of DC motor drives using controlled rectifiers.	
CO5	Are you able to analyze the performance & control of converter fed Induction motor, synchronous motor & stepper motor drives.	

Year/ Semester: 4th Year /7th Semester		Scheme of Study: 18-Scheme
Course Name : Arm & Embedded System		Course Code: 18EC753
CO1	Are you able to explain the organization,architecture, bus technology, memory and operation of ARM processors.	
CO2	Are you able to Apply the knowledge of instruction set of ARM processors to develop assembly language programs.	
CO3	Are you able to Understand the importance of thumb mode of operation of ARM processors.	
CO4	Are you to describe the techniques involved in writing C code form ARM processors, and exceptions and also understand the importance of Firmware, OS and cache in ARM embedded system.	

Year/ Semester: 4th Year /7th Semester		Scheme of Study: 18-Scheme
Course Name : Power System Simulation Laboratory		Course Code: 18EEL76
CO1	Are you able to Develop a program in suitable package to assess the performance of medium and long transmission lines.	
CO2	Are you able to Develop a program in suitable package to obtain the power angle characteristics of salient and non-salient pole alternator.	
CO3	Are you able to Develop a program in suitable package to assess the transient stability under three phase fault at different locations in a of radial power systems.	
CO4	Are you able to Develop programs in suitable package to formulate bus admittance and bus impedance matrices of interconnected power systems.	
CO5	Are you able to Use suitable package to solve power flow problem for simple power systems.	
CO6	Are you able to Use suitable package to study unsymmetrical faults at different locations in radial power systems.	
CO7	Are you able to Use of suitable package to study optimal generation scheduling problems for thermal power plants.	

Year/ Semester: 4th Year /8th Semester		Scheme of Study: 18-Scheme
Course Name : Power System Operation And Control		Course Code: 18EE81
CO1	Are you able to Describe various levels of controls in power systems, architecture and configuration of SCADA.	
CO2	Are you able to Develop and analyze mathematical models of Automatic Load Frequency Control.	
CO3	Are you able to Develop mathematical model of Automatic Generation Control in Interconnected Power system.	
CO4	Are you able to Discuss the Control of Voltage , Reactive Power and Voltage collapse.	
CO5	Are you able to Explain security, contingency analysis, state estimation of power systems.	

Year/ Semester: 4 th Year /8 th Semester		Scheme of Study: 18-Scheme
Course Name : Electrical Estimation And Costing		Course Code: 18EE822
CO1	Are you able to Discuss wiring methods, cables used, design of lighting points and sub-circuits, internal wiring, wiring accessories and fittings, fuses and types.	
CO2	Are you able to Discuss estimation of service mains and power circuits.	
CO3	Are you able to Discuss estimation of overhead transmission and distribution system its components.	
CO4	Are you able to Discuss types of substation, main components and estimation of substation.	
CO5	Are you able to Discuss wiring methods, cables used, design of lighting points and sub-circuits, internal wiring, wiring accessories and fittings, fuses and types.	