

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

**COURSE OUTCOMES (R23 Regulation)**

**II YEAR , I – SEMESTER**

**Course Name: Probability And Complex Variables(23A54302)**

Course Code	Course Outcome
CO_1	Understand the concepts of Probability, Random Variables and their characteristics (BL-2, BL-3)
CO_2	Learn how to deal with multiple random variables, conditional probability, joint distribution and statistical independence. (BL-3, BL-5)
CO_3	Formulate and solve engineering problems involving random variables. (BL-3)
CO_4	Analyze limit, continuity and differentiation of functions of complex variables and Understand Cauchy-Riemann equations, analytic functions and various properties of analytic functions. (BL-2, BL-3)
CO_5	Understand Cauchy theorem, Cauchy integral formulas and apply these to evaluate complex contour integrals. Classify singularities and poles; find residues and evaluate complex integrals using the residue theorem. (BL-3, BL-5)

**Course Name: Universal Human Values (23A52301)**

Course Code	Course Outcome
CO_1	Define the terms like Natural Acceptance, Happiness and Prosperity (BL-1, BL-2)
CO_2	Identify one's self, and one's surroundings (family, society nature) (BL-1, BL-2)
CO_3	Apply what they have learnt to their own self in different day-to-day settings in real life (BL-3)
CO_4	Relate human values with human relationship and human society. (BL-4)
CO_5	Justify the need for universal human values and harmonious existence (BL-5)

**Course Name: Signals, Systems And Stochastic Processes (23A04301)**

Course Code	Course Outcome
CO_1	Understand the mathematical description and representation of continuous-time and discrete-time signals and systems, Also, understand the concepts of various transform techniques and Random Processes (BL-2)
CO_2	Apply sampling theorem to convert continuous-time signals to discrete-time signals and reconstruct back, different transform techniques to solve signals and system related problems. (BL-3)
CO_3	Formulate and solve engineering problems involving random processes. (BL-3)
CO_4	Analyze the frequency spectra of various continuous-time signals using different transform methods. (BL-4)
CO_5	Classify the systems based on their properties and determine the response of them. (BL-4)

**Course Name: Electronic Devices & Circuits (23A04302T)**

Course Code	Course Outcome
CO_1	Understand principle of operation, characteristics and applications of semiconductor diodes, special diodes, BJTs, JFET and MOSFETs. (BL-2)
CO_2	Applying the basic principles solving the problems related to Semiconductor diodes, BJTs, and MOSFETs. (BL-3)
CO_3	Analyze diode circuits for different applications such as rectifiers, clippers and clampers also analyze biasing circuits of BJTs, and MOSFETs. (BL-4)
CO_4	Design of diode circuits and amplifiers using BJTs, and MOSFETs. (BL-4)
CO_5	Compare the performance of various semiconductor devices. (BL-4)

**Course Name: Digital Circuits Design (23A04303T)**

Course Code	Course Outcome
CO_1	Understand the properties of Boolean algebra, logic operations, concepts of FSM (BL-2)
CO_2	Apply techniques for minimization of Boolean functions (BL-3)
CO_3	Analyze combinational and Sequential logic circuits. (BL-4)
CO_4	Compare various Programmable logic devices. (BL-4)
CO_5	Design and Model combinational and sequential circuits using HDLs. (BL-5, BL-6)

**Course Name: Python Programming (23A05304)**

Course Code	Course Outcome
CO_1	Showcase adept command of Python syntax, deftly utilizing variables, data types, control structures, functions, modules, and exception handling to engineer robust and efficient code solutions. (BL-4)
CO_2	Apply Python programming concepts to solve a variety of computational problems (BL-3)
CO_3	Understand the principles of object-oriented programming (OOP) in Python, including classes, objects, inheritance, polymorphism, and encapsulation, and apply them to design and implement Python programs (BL-3)
CO_4	Proficient in using commonly used Python libraries and frameworks such as JSON, XML, NumPy, pandas (BL-2)
CO_5	Exhibit competence in implementing and manipulating fundamental data structures such as lists, tuples, sets, dictionaries (BL-3)

**Course Name: Environmental Science (23A99301)**

Course Code	Course Outcome
CO_1	To make the students to get awareness on environment.
CO_2	To understand the importance of protecting natural resources, ecosystems for future generations and pollution causes due to the day to day activities of human life
CO_3	To save earth from the inventions by the engineers.

**Course Name: Electronic Devices & Circuits Lab (23A04302P)**

Course Code	Course Outcome
CO_1	Understand the characteristics and applications of basic electronic devices. (BL-2)
CO_2	Plot the characteristics of electronic devices. (BL-3)
CO_3	Analyze various biasing circuits and electronic circuits as amplifiers (BL-4).
CO_4	Design MOSFET / BJT based amplifiers for the given specifications. (BL-5)
CO_5	Simulate all circuits in PSPICE /Multisim. (BL-5).

**Course Name: Digital Design & Signal Simulation Lab(23A04303P)**

Course Code	Course Outcome
CO_1	Verify the truth tables of various logic circuits. (BL-2)
CO_2	Understand how to simulate different types of signals and system response. (BL-2)
CO_3	Design sequential and combinational logic circuits and verify their functionality. (BL-3, BL-4)
CO_4	Analyze the response of different systems when they are excited by different signals and plot power spectral density of signals. (BL-4)
CO_5	Generate different random signals for the given specifications. (BL-5)

**II YEAR , II – SEMESTER**

**Course Name: Managerial Economics And Financial Analysis (23A52402A)**

Course Code	Course Outcome
CO_1	To inculcate the basic knowledge of microeconomics and financial accounting (BL-2)
CO_2	To make the students learn how demand is estimated for different products, input output relationship for optimizing production and cost (BL-2)
CO_3	To Know the Various types of market structure and pricing methods and strategy (BL-4)
CO_4	To give an overview on investment appraisal methods to promote the students to learn how to plan long-term investment decisions (BL-4)
CO_5	To provide fundamental skills on accounting and to explain the process of preparing financial statements. (BL-5)

**Course Name: Linear Control Systems (23A04401)**

Course Code	Course Outcome
CO_1	Introduce the basic principles and applications of control systems (BL-1)
CO_2	Learn the time response and steady state response of the systems. (BL-3)
CO_3	Know the time domain analysis and solutions to time invariant systems(BL-2)
CO_4	Understand different aspects of stability analysis of systems in frequency domain(BL-4)
CO_5	Understand the concept of state space, controllability and observability(BL-5)

**Course Name: EM Waves And Transmission Lines (23A04402)**

Course Code	Course Outcome
CO_1	Learn the concepts of wave theory and its propagation through various mediums. (BL-2)
CO_2	Understand the properties of transmission lines and their applications. (BL-2)
CO_3	Apply the laws & theorems of electrostatic fields to solve the related problems (BL-3)
CO_4	Gain proficiency in the analysis and application of magnetostatic laws and theorems (BL-4)
CO_5	Analyze Maxwell's equations in different forms. (BL-4)

**Course Name: Electronic Circuits Analysis (23A04403T)**

Course Code	Course Outcome
CO_1	Understand the characteristics of differential amplifiers, feedback and power amplifiers. (BL-2)
CO_2	Examine the frequency response of multistage and differential amplifier circuits using BJT & MOSFETs at low and high frequencies. (BL-3)
CO_3	Investigate different feedback and power amplifier circuits based on the application. (BL-4)
CO_4	Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillator circuits. (BL-4)
CO_5	Evaluate the performance of different tuned amplifiers (BL-5)

**Course Name: Analog And Digital Communications (23A04404T)**

Course Code	Course Outcome
CO_1	Recognize the basic terminology used in analog and digital communication technique for transmission of information/data. (BL-1)
CO_2	Explain the basic operation of different analog and digital communication systems at baseband and passband level. (BL-2)
CO_3	Compute various parameters of baseband and passband transmission schemes by applying basic engineering knowledge. (BL-3)
CO_4	Analyze the performance of different modulation & demodulation techniques to solve complex problems in the presence of noise. (BL-4)

**Course Name: Design Thinking & Innovation (23A99401)**

Course Code	Course Outcome
CO_1	Define the concepts related to design thinking. (BL-1, BL-2)
CO_2	Explain the fundamentals of Design Thinking and innovation (BL-1, BL-2)
CO_3	Apply the design thinking techniques for solving problems in various sectors. (BL-3)
CO_4	Analyse to work in a multidisciplinary environment (BL-4)
CO_5	Evaluate the value of creativity (BL-5)

**Course Name: Soft Skills (23A52403)**

Course Code	Course Outcome
CO_1	List out various elements of soft skills (BL-1, BL-2)
CO_2	Describe methods for building professional image (BL-1, BL-2)
CO_3	Apply critical thinking skills in problem solving (BL-3)
CO_4	Analyse the needs of an individual and team for well-being (BL-4)

**Course Name: Electronic Circuits Analysis Lab (23A04403P)**

Course Code	Course Outcome
CO_1	Know about the usage of equipment/components/software tools used to conduct experiments in analog circuits. (BL-2)
CO_2	Conduct the experiment based on the knowledge acquired in the theory about various analog circuits using BJT/MOSFETs to find the important parameters of the circuit experimentally. (BL-3)
CO_3	Analyze the given analog circuit to find required important metrics of it theoretically. (BL-4)
CO_4	Compare the experimental results with that of theoretical ones and infer the conclusions. (BL-4)
CO_5	Design the circuit for the given specifications. (BL-6)

**Course Name: Analog And Digital Communications Lab (23A04404P)**

Course Code	Course Outcome
CO_1	Know about the usage of equipment/components/software tools used to conduct experiments in analog and digital modulation techniques. (BL-2)
CO_2	Conduct the experiment based on the knowledge acquired in the theory about modulation and demodulation schemes to find the important metrics of the communication system experimentally. (BL-3)
CO_3	Analyze the performance of a given modulation scheme to find the important metrics of the system theoretically. (BL-4)
CO_4	Compare the experimental results with that of theoretical ones and infer the conclusions. (BL-4)