

ELECTRONICS ENGINEERING (ADVANCED COMMUNICATION TECHNOLOGY)

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: Probability and Complex Variables		Course Code: 23A54302
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes: After successful completion of the course, student will be able to:	
CO 1	Understand the concepts of Probability, Random Variables and their characteristics (L2, L3)
CO 2	Learn how to deal with multiple random variables, conditional probability, joint distribution and statistical independence. (L3, L5)
CO 3	Formulate and solve engineering problems involving random variables. (L3)
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. (L2, L3)
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 (L3, L5)

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: Universal Human Values Understanding Harmony and Ethical human conduct		Course Code: 23A52301
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes: After successful completion of the course, student will be able to:	
CO 1	Define the terms like Natural Acceptance, Happiness and Prosperity. (BL1, BL2)
CO 2	Identify one's self, and one's surroundings (family, society nature). (BL1, BL2)
CO 3	Apply what they have learnt to their own self in different day-to-day settings in real life. (BL3)
CO 4	Relate human values with human relationship and human society. (BL4)
CO 5	Justify the need for universal human values and harmonious existence. (BL5)

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: SIGNALS, SYSTEMS AND STOCHASTIC PROCESSES	Course Code: 23A04301	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes:

- 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 (L2)
- 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. (L3)
- Formulate and solve engineering problems involving random processes. (L3)
- Analyze the frequency spectra of various continuous-time signals using different transform methods. (L4)
- Classify the systems based on their properties and determine the response of them. (L4)

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: ELECTRONIC DEVICES & CIRCUITS	Course Code: 23A04302T	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes: *After the completion of the course students will be able to*

- Understand principle of operation, characteristics and applications of semiconductor diodes, special diodes, BJTs, JFET and MOSFETs. (L2)
- Applying the basic principles solving the problems related to Semiconductor diodes, BJTs, and MOSFETs. (L3)
- Analyze diode circuits for different applications such as rectifiers, clippers and clampers also analyze biasing circuits of BJTs, and MOSFETs. (L4)
- Design of diode circuits and amplifiers using BJTs, and MOSFETs. (L4)
- Compare the performance of various semiconductor devices. (L4)

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: DIGITAL CIRCUITS DESIGN		Course Code: 23A04303T
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 1.5

Course Outcomes: After completing the course, the student should be able to:

- Understand the properties of Boolean algebra, logic operations, concepts of FSM (L2)
- Apply techniques for minimization of Boolean functions (L3)
- Analyze combinational and Sequential logic circuits. (L4)
- Compare various Programmable logic devices. (L4)
- Design and Model combinational and sequential circuits using HDLs. (L5, L6)

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: ELECTRONIC DEVICES & CIRCUITS LAB		Course Code: 23A04302P
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 1.5

Course Outcomes:

- Understand the characteristics and applications of basic electronic devices. (L2)
- Plot the characteristics of electronic devices. (L3)
- Analyze various biasing circuits and electronic circuits as amplifiers (L4).
- Design MOSFET / BJT based amplifiers for the given specifications. (L5)
- Simulate all circuits in PSPICE /Multisim. (L5).

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: DIGITAL DESIGN & SIGNAL SIMULATION LAB	Course Code: 23A04303P	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 2

Course Outcomes: After completing the course, the student should be able to:

- Verify the truth tables of various logic circuits. (L2)
- Understand how to simulate different types of signals and system response. (L2)
- Design sequential and combinational logic circuits and verify their functionality. (L3, L4)
- Analyze the response of different systems when they are excited by different signals and plot power spectral density of signals. (L4)
- Generate different random signals for the given specifications. (L5)

COURSE DETAILS		
Class: II B. Tech	Semester: I	Academic Year: 2024-25
Course Title: PYTHON PROGRAMMING	Course Code: 23A05304	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes: After completion of the course, students will be able to

- 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. (L4)
- Apply Python programming concepts to solve a variety of computational problems (L3)
- 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 (L3)
- Proficient in using commonly used Python libraries and frameworks such as JSON, XML, NumPy, pandas (L2)
- Exhibit competence in implementing and manipulating fundamental data structures such as lists, tuples, sets, dictionaries (L3)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	Course Code: 23A52402a	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes:

- Define the concepts related to Managerial Economics, financial accounting and management(L2)
- Understand the fundamentals of Economics viz., Demand, Production, cost, revenue and markets (L2)
- Apply the Concept of Production cost and revenues for effective Business decision (L3)
- Analyze how to invest their capital and maximize returns (L4)
- Evaluate the capital budgeting techniques. (L5)
- Develop the accounting statements and evaluate the financial performance of business entity (L5)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: ORGANISATIONAL BEHAVIOUR	Course Code: 23A52402b	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes:

- Define the Organizational Behaviour, its nature and scope. (L2)
- Understand the nature and concept of Organizational behaviour (L2)
- Apply theories of motivation to analyse the performance problems (L3)
- Analyse the different theories of leadership (L4)
- Evaluate group dynamics (L5)
- Develop as powerful leader (L5)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: BUSINESS ENVIRONMENT		Course Code: 23A52402c
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 3

Course Outcomes:

- Define Business Environment and its Importance. (L2)
- Understand various types of business environment. (L2)
- Apply the knowledge of Money markets in future investment (L3)
- Analyse India's Trade Policy (L4)
- Evaluate fiscal and monetary policy (L5)
- Develop a personal synthesis and approach for identifying business opportunities (L5)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: LINEAR CONTROL SYSTEMS		Course Code: 23A04401
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 1.5

Course Outcomes: After completing the course, the student should be able to:

- Summarize the basic principles and applications of control systems. (L2)
- Understand the time response and steady state response of the systems. (L2)
- Understand the concept of state space, controllability and observability. (L2)
- Apply time domain analysis to find solutions to time invariant systems. (L3)
- Analyze different aspects of stability analysis of systems in frequency domain. (L4)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: EM WAVES AND TRANSMISSION LINES	Course Code: 23A04402	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 1.5

Course Outcomes: At the end of this course the student will be able to:

- Learn the concepts of wave theory and its propagation through various mediums. (L2)
- Understand the properties of transmission lines and their applications. (L2)
- Apply the laws & theorems of electrostatic fields to solve the related problems (L3)
- Gain proficiency in the analysis and application of magnetostatic laws and theorems (L4).
- Analyze Maxwell's equations in different forms. (L4)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: ELECTRONIC CIRCUITS ANALYSIS	Course Code: 23A04403T	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 2

Course Outcomes:

- Understand the characteristics of differential amplifiers, feedback and power amplifiers. (L2)
- Examine the frequency response of multistage and differential amplifier circuits using BJT & MOSFETs at low and high frequencies. (L3)
- Investigate different feedback and power amplifier circuits based on the application. (L4)
- Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillator circuits. (L4)
- Evaluate the performance of different tuned amplifiers (L5)
- Design analog circuits for the given specifications and application. (L6)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: ANALOG AND DIGITAL COMMUNICATIONS	Course Code: 23A04404T	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 2

Course Outcomes:

- Recognize the basic terminology used in analog and digital communication technique for transmission of information/data. (L1)
- Explain the basic operation of different analog and digital communication systems at baseband and passband level. (L2)
- Compute various parameters of baseband and passband transmission schemes by applying basic engineering knowledge. (L3)
- Analyze the performance of different modulation & demodulation techniques to solve complex problems in the presence of noise. (L4)
- Evaluate the performance of all analog and digital modulation techniques to know the merits and demerits of each one of them in terms of bandwidth and power efficiency. (L5)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: ELECTRONIC CIRCUITS ANALYSIS LAB	Course Code: 23A04403P	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 2

Course Outcomes:

- Know about the usage of equipment/components/software tools used to conduct experiments in analog circuits. (L2)
- 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. (L3)
- Analyze the given analog circuit to find required important metrics of it theoretically. (L4)
- Compare the experimental results with that of theoretical ones and infer the conclusions. (L4)
- Design the circuit for the given specifications. (L6)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: SOFT SKILLS	Course Code: 23A52403	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 2

Course Outcomes

- List out various elements of soft skills (L1, L2)
- Describe methods for building professional image (L1, L2)
- Apply critical thinking skills in problem solving (L3)
- Analyse the needs of an individual and team for well-being (L4)
- Assess the situation and take necessary decisions (L5)
- Create a productive workplace atmosphere using social and work-life skills ensuring personal and emotional well-being (L6)

COURSE DETAILS		
Class: II B. Tech	Semester: II	Academic Year: 2024-25
Course Title: ANALOG AND DIGITAL COMMUNICATIONS LAB	Course Code: 23A04404P	
Regulation: NECR BTECH 23	Program/Dept.: B.Tech/ECA	Credits: 2

Course Outcomes:

- Know about the usage of equipment/components/software tools used to conduct experiments in analog and digital modulation techniques. (L2)
- 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. (L3)
- Analyze the performance of a given modulation scheme to find the important metrics of the system theoretically. (L4)
- Compare the experimental results with that of theoretical ones and infer the conclusions. (L4)