DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (R21 Regulation)

Course Name: ALGEBRA & CALCULUS(21MA1001)

21MA1001	ALGEBRA & CALCULUS
CO_1	Make use the concepts of Matrices to solve various Engineering problems. [BL-3]
CO_2	Identify different types of higher order differential equations and their applications in solving engineering problems [BL:3]
CO_3	Apply Mean value theorems, Multi variable calculus to solve engineering problems. [BL-3]
CO_4	Apply a range of techniques for solutions of first order Linear and non-Linear Partial Differential Equations (PDE). [BL:3]
CO_5	Apply the techniques of multiple integrals for the area and volume of the region bounded by curves. [BL:3]

Course Name: Applied Physics (21PH1001)

21PH1001	Applied Physics
CO_1	Explain the conecpts of interference, diffraction using Huygen‘s wave theory [BL-2]
CO_2	Comprehend the conecpts of matter waves, wave functions and their interpretation for understanding the matter at atomic scale [BL-1]
CO_3	Summarize the importance of free electron theories in determining the properties of metals and semiconductors [BL-1]
CO_4	Understand the concepts of superconductor and nanomaterials to familarize their applications in relevant fields [BL-2]
CO_5	Realize the importance of the lasers and optical fibres in engineering and medical applications [BL-2]

Course Name: Problem Solving and Programming (21ES1001)

21ES1001	Problem Solving and Programming
CO_1	Identify methods to solve a problem through computer programming.[BL-3]
CO_2	Understand the use of operators and input/output. [BL-2]
CO_3	Understand the difference and the usage of various control statements and Functions [BL-2]
CO_4	Apply arrays and pointers for solving problems. [BL-2]
CO_5	Explain user defined data types and files. [BL-2]

Course Name: Basic Electrical Engineering (21ES1502)

21ES1502	Basic Electrical Engineering
CO_1	Analyze DC and AC circuits with different sources .(BL-4)
CO_2	Apply the concept of network theorems in solving DC and AC circuits .(BL-3)
CO_3	Discuss the operation and construction of DC machine.(BL-2)
CO_4	Describe the operation and construction of single and three phase transformer.(BL-2)
CO_5	Explain the operation and construction of AC Machines.(BL-2)

Course Name: Applied Physics Lab (21PH1501)

21PH1501	Applied Physics Lab
CO_1	Learn important concepts of physics through involvement in the experiments by applying theoretical knowledge.
CO_2	Understand the concepts of interference and diffraction and their applications.
CO_3	Recognize the applications of laser in finding wavelength, slit width and its role in diffraction studies.
CO_4	Understand the important parameters of optical fibers and metals.

Course Name: Oral Communication Skills Lab (21EN1502)

21EN1502	Oral Communication Skills Lab
CO_1	To understand the communication concepts and to develop the students' competence in communication at an advanced level
CO_2	To participate in Team activities that leads to the development of collaborative work skills
CO_3	To develop strategies appropriately to improve Listening skills and Spoken Skills
CO_4	To provide the knowledge on Presentation Skills , Group Discussion, Interview Skills and Resume Writing
CO_5	To improve skills to write resume, cover letter and Technical report

Course Name: Basic Electrical Engineering Lab (21ES1502)

21ES1502	Basic Electrical Engineering Lab
CO_1	Solve the given electrical circuit using basic Kirchhoff's laws and network theorems (BL-3)
CO_2	Analyze the simple DC circuits using Pspice (BL-3)
CO_3	Determine the performance characteristics of DC Machines. (BL-3)
CO_4	Determine the performance of single phase transformer & three phase Induction motor (BL-3)

Course Name: Engineering & IT Workshop (21ES1505)

21ES1505	Engineering & IT Workshop
CO_1	Understand the safety aspects in using the tools and equipments.(BL-2)
CO_2	Apply tools for making models in respective trades of engineering workshop.(BL-3)
CO_3	Apply basic electrical engineering knowledge to makes imple housewiring circuits And check their functionality.(BL-3)
CO_4	Understand to disassemble and assemble a Personal Computer and prepare the Computer ready to use(BL-2)
CO_5	Apply knowledge to Interconnect two or more computers for information sharing (BL-3)

Course Name: Problem Solving and Programming Lab (21ES1501)

21ES1501	Problem Solving and Programming Lab
CO_1	Translate algorithms into programs.(BL-2)
CO_2	Code and debug programs in C language using various constructs. (BL-3)
CO_3	Solve the problems and implement algorithms in C. (BL-3)
CO_4	Make use of different data types to handle the real time data.(BL - 3)

Course Name: Chemistry (21CH1001)

21CH1001	Chemistry
CO_1	Understand the fundamental concepts of chemistry to predict the structure and bonding of materials.(BL-2)
CO_2	Discuss various kinds of electro chemical cells.(BL-3)
CO_3	Compare the materials of various energy storage devices and emerging technologies.(BL-3)
CO_4	Demonstrate the mechanism and applications of different polymers in electronic devices.(BL-3)
CO_5	Explain calorific values, refining of petroleum and cracking of oils.(BL-2)

Course Name: Vector Calculus & Transforms (21MA1004)

21MA1004	Vector Calculus & Transforms
CO_1	Interpret the different operators such as gradient, curl and divergence to find out point function. (L-3)
CO_2	evaluate area and volumes by Apply the fundamental theorems. (L-5)
CO_3	Apply Laplace and Inverse Laplace transforms techniques to solve the differential equations and its application .(L-3)
CO_4	Develop the Fourier Series to the given periodic functions (L-3)
CO_5	Apply the concepts of Fourier transforms to Find impulse (L-3)

Course Name: Python Programming And Data Science (21ES1005)

21ES1005	Python Programming And Data Science
CO_1	Demonstrate various operators, data types and decision structures in python. (BL - 3)
CO_2	Solve problems using Functions and data structures in Python (BL - 3)
CO_3	Implement the concept of Files and Modules (BL - 3)
CO_4	Implement Data Science queries using NUMPY module (BL - 3)
CO_5	Solve data manipulation task using PANDAS module (BL - 3)

Course Name: English (21EN1001)

21EN1001	English
CO_1	Acquire in depth knowledge on formulating appropriate sentences with grammatical accuracy and vocabulary building. (B.L:2)
CO_2	Understand the factors that influence in use of grammar and effective strategies for professional written communication (B.L:2)
CO_3	Explain the use of Grammar to improve effective writing Note making & Paraphrasing. (B.L:2)
CO_4	Understand the Grammar to write dialogues and reviews effectively. (B.L:2)
CO_5	Develop the skills and sub skills of reading and use strategies for reading effectively and provide knowledge on the structure and format of technical writing. (B.L:3)

Course Name: Chemistry Lab (21CH1501)

21CH1501	**Chemistry Lab**
CO_1	Determine the cell constant and conductance of solutions.
CO_2	Perform quantitative analysis using instrumental methods.
CO_3	Utilize the fundamental laboratory techniques for analysis such as titrations, separation/purification and spectroscopy.
CO_4	Analyze and gain experimental skills.

Course Name: English Language Lab (21EN1501)

21EN1501	English Language Lab
CO_1	To expose the students to develop knowledge and awareness of English speech sounds, word accent, intonation and rhythm
CO_2	To sensitize the students to the nuances of English speech sounds, word accent, intonation and thythm
CO_3	To develop strategies appropriately to improve Listening skills and Spoken Skills
CO_4	To improve the descriptive strategies and presentation styles
CO_5	To distinguish main ideas and specific details and make use of contextual clues to infer meanings of unfamiliar words from context.
CO_6	To improve the skills to exhibit the main ideas in the poster

Course Name: Engineering Graphics (21ES1503)

21ES1503	Engineering Graphics
CO_1	Define the qualities of precision and accuracy in engineering drawing. (BL-1)
CO_2	Draw engineering curves using different methods. (BL-3)
CO_3	Develop the orthographic projection of points and straight lines. (BL-3)
CO_4	Construct planes and simple solids. (BL-3)
CO_5	Understand and practice basic AUTOCAD commands (BL-2)

Course Name: Python Programming and Data Science Lab (21ES1508)

21ES1508	Python Programming and Data Science Lab
CO_1	Understanding and use of python- Basic Concepts(BL -2)
CO_2	Solve the problems using python Iterative Statements(BL -3)
CO_3	Understand the concepts of files, modules(BL -2)
CO_4	Solve the Numerical problems that involve Matrices (BL -3)
CO_5	Provide solutions for data cleaning tasks(BL-3)

Course Name: Complex Analysis and Numerical Methods (21MA1005)

21MA1005	Complex Analysis and Numerical Methods
CO_1	Apply the techniques of special functions in various engineering problems. [BL:3]

CO_2	Evaluate derivatives of complex functions. [BL:5]
CO_3	Evaluate improper integrals of complex functions using Residue theorem. [BL:5]
CO_4	Solve algebraic and transcendental equations and interpolate the trend value. [BL:3]
CO_5	To Solve ordinary differential equations by using numerical methods. [BL:3]

Course Name: Data Structures And Algorithms (21ES1009)

21ES1009	**Data Structures And Algorithms**
CO_1	Analyze the performance of algorithms to find the time and space complexities and define the asymptotic notations. (BL2)
CO_2	Develop the applications using structures, unions, stacks, queues and linked list.(BL3)
CO_3	Select and appropriate sorting algorithm. (BL2)
CO_4	Outline various tree structures.(BL3)
CO_5	Analyse various Graph and Hashing techniques.(BL 3)

Course Name: Electronic Devices and Circuits (21ES1010)

21ES1010	**Electronic Devices and Circuits**
CO_1	Illustrate theV-I characteristics of P-N junction Diode and special semiconductor devices. (BL-2)
CO_2	Demonstrate the performance of rectifiers with and without filters. (BL-2)
CO_3	Compare the operating characteristics of BJT (BL-3)
CO_4	Analyze the BJT biasing techniques. (BL-4)
CO_5	Interpret the characteristics of MOSFET. (BL-2)

Course Name: Signals and Systems (21EC2003)

21EC2003	Signals and Systems
CO_1	Understand the mathematical description and representation of continuous and discrete-time signals and systems.(BL-2)
CO_2	Solve the problems based on the concepts of Fourier series and properties.(BL-3)
CO_3	Analyze the frequency spectra of various continuous and discrete-time signals using Fourier transform methods. (BL-4)
CO_4	Apply sampling theorem to convert continuous-time signals into discrete-time signals with different techniques and reconstruct back. (BL-3)
CO_5	Apply Laplace & Z-Transform as mathematical tool to continuous and discrete-time signals and systems.(BL-3)

Course Name: Digital Logic Design (21EC2001)

21EC2001	Digital Logic Design
CO_1	Use number systems, binary codes and Boolean algebra to implement digital circuits (BL-3)

CO_2	Apply minimization techniques on Boolean expressions. (BL-3)
CO_3	Design combinational circuits using logic gates. (BL-3)
CO_4	Analyze synchronous sequential circuits. (BL-4)
CO_5	Classify the memories and programmable logic devices. (BL-2)

Course Name: Network Analysis (21EC2002)

21EC2002	Network Analysis
CO_1	Describe the Series resonance ,parallel resonance and analyze the locus diagramsof R,L,C(BL-2)
CO_2	Analyze the DC transients of R,L,C (BL-4)
CO_3	Analyze the AC transients of R,L,C (BL-4)
CO_4	Derive Two port network parameters of Electrical circuits(BL-3)
CO_5	Analyze the Filters and Network functions(BL-4)

Course Name: Electronic Devices and Circuits Lab (21ES1514)

21ES1514	Electronic Devices and Circuits Lab
CO_1	Demonstrate the basic characteristics and applications of basic electronic devices. (BL-2)
CO_2	Draw the characteristics of electronic devices by plotting graphs(BL-2)
CO_3	Analyze the Characteristics of UJT, BJT, FET, and SCR (BL-4)
CO_4	Design FET based amplifier circuits/BJT based amplifiers for the given specifications.(BL-3)

Course Name: Data Structures And Algorithms Lab (21ES1513)

21ES1513	Data Structures And Algorithms Lab
CO_1	Apply the Arrays and linked lists for solving the problems. (BL -3)
CO_2	Apply the stacks and queues for solving the given applications. (BL -3)
CO_3	Implement operations on binary trees and binary search trees for given applications. (BL -3)
CO_4	Implement searching and sorting algorithms for given applications. (BL -3)

Course Name: Electronic Circuit Analysis And Design (21EC2006)

21EC2006	Electronic Circuit Analysis And Design
CO_1	Analyze small signal amplifiers at low frequencies and high frequencies.(BL-4)
CO_2	Understand the concept of different negative feedback amplifiers. (BL-2)
CO_3	Understand the working principle of RC & LC oscillators. (BL-2)
CO_4	Analyze various configurations of multistage amplifiers. (BL-4)
CO_5	Learn operation of Power amplifiers and Tuned amplifiers.(BL-2)

Course Name: Control Systems (21EC2004)

21EC2004	Control Systems
CO_1	Solve the transfer function for the given electrical or mechanical systems. (BL-3)
CO_2	Explain the control system behaviour in time domain for step signal with various damping‘s. (BL-2)
CO_3	Analyze the stability of given system by using Routh's stability criteria and Root locus plot. (BL-4)
CO_4	Analyze the stability of given system by means of Bode plot, polar plot & Nyquist plot (BL-4)
CO_5	Analyze controllability & observability for the given state model. (BL-4)

Course Name: Electromagnetic Waves And Transmission Lines (21EC2005)

21EC2005	Electromagnetic Waves And Transmission Lines
CO_1	Apply the Coulomb‘s law and Gauss law for different charge distributions.(BL-3)
CO_2	Apply Biot-Savart's Law and Ampere‘s Circuit law to static current distributions.(BL-03)
CO_3	Apply Maxwell's equations for time varying electromagnetic fields (BL-3)
CO_4	Interpret the wave propagation through different mediums. (BL-2)
CO_5	Understand the concept of transmission lines & their applications. (BL-2)

Course Name: Probability And Stochastic Processes (21EC2007)

21EC2007	Probability And Stochastic Processes
CO_1	Apply the concepts on appropriate sample space to find probabilities (BL-3)
CO_2	Calculate statistical averages from probability density functions (pdfs) and probability distribution functions (BL-3)
CO_3	Apply the different operations to multiple random variables (BL-3)
CO_4	Analyze power spectral density and cross power density spectrum of a random process. (BL-4)
CO_5	Analyze the response of a system using principles of random process. (BL-4)

Course Name: Electronic Circuit Analysis And Design Lab (21EC25001)

21EC25001	Electronic Circuit Analysis And Design Lab
CO_1	Measure various parameters of analog circuits and compare experimental results in the laboratory with theoretical analysis. (BL-3)
CO_2	Analyze negative feedback amplifier circuits, oscillators, Power amplifiers, Tuned amplifiers.(BL-4)
CO_3	Design analog electronic circuits using discrete components (BL-3)
CO_4	Design RC and LC oscillators, Feedback amplifier for specified gain and multistage amplifiers for Low, Mid and high frequencies. (BL-3)

Course Name: Matlab And Simulink Lab (21EC2502)

21EC2502	Matlab And Simulink Lab
CO_1	Demonstrate knowledge in Operations on Matrices.• Generation of Various signals and Sequences.• Convolution and Correlation of signals and Sequences. (BL-2)•
CO_2	Understand the different operation that can be performed on signals and sequences. (BL-2)
CO_3	Apply different transforms on a given signal to draw magnitude and phase spectrum. (BL-3)
CO_4	Identify whether the given system is linear or non-linear and time variant or invariant. (BL-3)
CO_5	Understand the verification of sampling theorem. (BL-2)