



DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (R20 Regulation)

Course Name: ALGEBRA & CALCULUS (20MA1001)

Course Code	Course Outcome
CO_1	Solve the system of Linear Equations.[BL:3]
CO_2	Solve first order differential equations utilizing the standard techniques for separable, exact, linear, homogeneous, Bernoulli cases. [BL:3]
CO_3	Obtain the complete solution of higher order differential equations. [BL:2]
CO_4	Make use of Taylor's and Mclaurin's series and maxima, minima for the given function. [BL:3]
CO_5	Apply a range of techniques for solutions of first order Linear and non-linear partial differential equations. [BL:3]
CO_6	Apply techniques of Multiple integrals for the area of region bounded by curves and volume. [BL:3]

Course Name: Applied Physics (20PH1001)

Course Code	Course Outcome
CO_1	Explain optical phenomenon i.e interference, diffraction using Huygen's wave theory. (BL-2)
CO_2	Explain the concepts of matter waves, wave functions and its interpretation to understand the matter at atomic scale. (BL-2)
CO_3	Explain free electron theory on metals and dynamics of free electrons in metals. (BL-2)
CO_4	Compute carrier concentration in semiconductors to understand carrier transport mechanism in semiconductors. (BL-3)
CO_5	Explain the concepts of super conductors and nano materials to familiarize their applications in relevant fields. (BL-2)
CO_6	Explain the applications of Lasers in Engineering and medical applications. (BL-2)

Course Name: Problem Solving and Programming (20ES1001)

Course Code	Course Outcome
CO_1	Identify methods to solve a problem through computer programming.(BL-3)
CO_2	Explain the use of basic elements of C language. (BL-2)
CO_3	Explain the difference and usage of various control statements. (BL-2)
CO_4	Apply the modular approach for solving problems. (BL-3)
CO_5	Apply arrays and pointers for solving problems. (BL-2)
CO_6	Explain user defined data types and files. (BL-2)

Course Name: English (20EN1001)

Course Code	Course Outcome
CO_1	Acquire indepth knowledge on formulating appropriate sentences with grammatical accuracy and vocabulary building. (BL-2)
CO_2	Explain the factors that influence in use of grammar and learn to use sentences unambiguously.(BL-2)
CO_3	Impart effective strategies for professional written communication husing devices of coherence & cohesion with adequate support. (BL-3)
CO_4	Provide knowledge of use of phrases & clauses and improve effective writing note making and pparaphrasing. (BL-2)
CO_5	Explain the grammar rules for synthesis of sentences and use prewriting strategies to plan to write dialogues, reviews and edit the text effectively. (BL-3)
CO_6	Master the skills and sub skills of reading and use strategies for reading effectively and provide knowledge on the structure and format of technical writing. (BL:3)

Course Name: Applied Physics Lab (25PH1501)

Course Code	Course Outcome
CO_1	Learn important concepts of physics through involvement in the experiments by applying theoretical knowledge. (BL-2)
CO_2	Explain the concepts of interference and diffraction and their applications. (BL-2)
CO_3	Recognize the applications of laser in finding wavelength, slit width and its role in diffraction studies. (BL-2)
CO_4	Explain the important parameters of optical fibers and metals.(BL-2)

Course Name: English Language Lab (20EN1501)

Course Code	Course Outcome
CO_1	Apply knowledge of English phonetics and phonology to improve their pronunciation. (BL-3)
CO_2	Use pitch patterns to speak confidently and intelligibly within groups and before an audience.(BL-3)
CO_3	Discuss and respond to content of a lecture or listening passage orally and/or in writing and make inferences and predictions about spoken discourse. (BL-3)
CO_4	Produce coherent and unified paragraphs with adequate support and write paragraph with a topic sentence, support and concluding sentence. (BL-3)
CO_5	Cultivate the habit of reading passages from competitive exams such as GRE,TOEFL,GMAT etc. (BL-4)
CO_6	Learn, practice and acquire the skills necessary to deliver effective presentation with clarity and prepare resume with cover letter.(BL-2)

Course Name: Electronics and Communication Engineering Workshop (20ES1502)

Course Code	Course Outcome
CO_1	Identify discrete components, measuring instruments and ICs. (BL-3)
CO_2	Assemble and test simple electronic circuits over a PCB. (BL-2)
CO_3	Make use of EDA Tools and TINA software. (BL-3)
CO_4	Explain different types of transmission media such as guided and unguided media. (BL-2)

Course Name: Engineering & IT Workshop (20ES1505)

Course Code	Course Outcome
CO_1	Explain the safety aspects in using the tools and equipments. (BL-2)
CO_2	Make use of tools for making models in respective trades of engineering workshop. (BL-3)
CO_3	Apply basic electrical engineering knowledge to make simple house wiring circuits and check their functionality (BL-3)
CO_4	Demonstrate assembling and disassembling of 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 (20ES1506)

Course Code	Course Outcome
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 (20CH1001)

Course Code	Course Outcome
CO_1	Explain the fundamental concepts of chemistry to predict the structure and bonding of materials.(BL-2)
CO_2	Infer knowledge about various electro chemical cells.(BL-2)
CO_3	Describe various energy storage devices and emerging technologies. (BL-2)
CO_4	Explain the mechanism and applications of polymers in electronic devices.(BL-2)
CO_5	Familiarize various sources of renewable energy and their harnessing.(BL-3)
CO_6	Apply electromagnetic radiation to the spectroscopy methods for the analysis of engineering(BL-3)

Course Name: Vector Calculus & Transforms (20MA1004)

Course Code	Course Outcome
CO_1	Interpret the different operators such as gradient, curl and divergence to find out point function. (BL-2)
CO_2	Apply fundamental theorems of vector integration to evaluate area and volumes. (BL-3)
CO_3	Utilize the concept of Laplace transforms and convert time domain into frequency domain. (BL-3)
CO_4	Apply inverse Laplace transform techniques to solve the differential equations (BL-3)
CO_5	Develop Fourier series to the given periodic functions. (BL-3)
CO_6	Make use of Fourier Transform to illustrate discrete/continuous function. (BL-3)

Course Name: Basic Electrical Engineering (20ES1004)

Course Code	Course Outcome
CO_1	Analyze DC Circuits along with voltage and current sources. (BL-3)
CO_2	Analyze AC electrical circuits with RLC circuits. (BL-3)
CO_3	Solve real and reactive power for a three phase circuit. (BL-3)
CO_4	Explain the construction and operation of DC machines. (BL-2)
CO_5	Explain construction and operation of single and three phase transformer. (BL-2)
CO_6	Explain construction and operation of AC machines. (BL-2)

Course Name: Introduction to Python Programming (20ES1007)

Course Code	Course Outcome
CO_1	Summarize the fundamental concepts of Python Programming. (BL-2)
CO_2	Apply basic elements and constructs Python to solve logical problems. (BL-3)
CO_3	Organize data using different data structures of Python. (BL-3)
CO_4	Implement files, modules and packages in programming. (BL-3)
CO_5	Apply object oriented & exception handling concepts to build simple applications. (BL-3)
CO_6	Implement the concepts of Turtle graphics. (BL-3)

Course Name: Chemistry Lab (20CH1501)

Course Code	Course Outcome
CO_1	Determine the cell constant and conductance of solutions.(BL-4)
CO_2	Perform quantitative analysis using instrumental methods. (BL-3)
CO_3	Utilize the fundamental laboratory techniques for analysis such as titrations, separation/purification and spectroscopy. (BL-3)
CO_4	Analyze and gain experimental skills. (BL-3)

Course Name: Basic Electrical Engineering Lab (20ES1509)

Course Code	Course Outcome
CO_1	Verify basic Kirchoff's laws and solve electrical circuits. (BL-2)
CO_2	Analyze simple DC circuits using Pspice. (BL-3)
CO_3	Explain the performance characteristics of DC machines. (BL-2)

CO_4	Explain the performance characteristics of AC machines. (BL-2)
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Course Name: Engineering Graphics Lab (20ES1504)

Course Code	Course Outcome
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	Implement basic Autocad commands. (BL-3)
CO_6	Construct isometric views using Autocad. (BL-3)

Course Name: Introduction to Python Programming Lab (20ES1510) (C128)

Course Code	Course Outcome
CO_1	Explain basic concepts of Python.(BL-2)
CO_2	Solve the concepts of Python functions and data structures. (BL-3)
CO_3	Explain the concepts of files, modules, multithreading and regular expressions. (BL-2)
CO_4	Solve the concepts of class and exception handling. (BL-3)

Course Name: Complex Analysis and Numerical Methods (20MA1005)

Course Code	Course Outcome
CO_1	Apply the techniques of special functions in various engineering problems. [BL:3]
CO_2	Evaluate derivatives of complex functions. [BL:4]
CO_3	Evaluate improper integrals of complex functions using Residue theorem. [BL:4]
CO_4	Solve algebraic and transcendental equations and interpolate the trend value. [BL:2]
CO_5	Solve ordinary differential equations by using numerical methods. [BL:2]

Course Name: Data Structures (20ES1011)

Course Code	Course Outcome
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 (20ES1013)

Course Code	Course Outcome
CO_1	Illustrate the V-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: Digital Logic Design (20EC2001)

Course Code	Course Outcome
CO_1	Translate the numeric information in to different forms. [BL:1]
CO_2	Apply K-Map and Tabular methods to minimize Boolean functions [BL:3]
CO_3	Design various combinational logic circuits. [BL:3]
CO_4	Design various sequential circuits [BL:3]
CO_5	Design digital circuits using programmable logic devices.[BL:3]

Course Name: Electronic Devices and Circuits Lab (20ES1516)

Course Code	Course Outcome
CO_1	Demonstrate the Characteristics of UJT, BJT, FET, and SCR.[BL:2]
CO_2	Compare the performance of rectifiers with filters. [BL:4]
CO_3	Design FET and BJT based amplifier circuits for the given specifications.[BL:4]

Course Name: Analog Electronics (20EC2003)

Course Code	Course Outcome
CO_1	Analyze the small signal amplifiers at low frequencies and high frequencies.(BL-4)
CO_2	Explain the concept of different negative feedback amplifiers. (BL-2)
CO_3	Design the RC & LC oscillators. (BL-3)

CO_4	Explain the various configurations of multistage amplifiers. (BL-2)
CO_5	Analyze the characteristics of Power amplifiers and Tuned amplifiers.(BL-4)

Course Name: Control Systems (20EC2004)

Course Code	Course Outcome
CO_1	Analyze the transfer functions for Mechanical and Electrical systems(BL-4)
CO_2	Discuss the Time-domain responses for first and second-order systems(BL-2)
CO_3	Determine the stability analysis by using RH Criterion and Root Locus. in a closed-loop control systems(BL-2)
CO_4	Apply the frequency response methods for stability in a closed or open loop control system(BL-3)
CO_5	Interpret the concepts of state, state variables and state model in a control system(BL-2)

Course Name: Electromagnetic Theory and Transmission Lines (20EC2005)

Course Code	Course Outcome
CO_1	Apply the Coulomb's law and Gauss law to different charge distributions. [BL:3]
CO_2	Apply Biot-Savart Law, Ampere's Circuit law to static current distributions. [BL:3]
CO_3	Apply Maxwell's equations for time varying fields. [BL:3]
CO_4	Describe the Characteristics of EM Wave. [BL:2]
CO_5	Explain various parameters of transmission lines. [BL:2]

Course Name: Probability and Random Processes (20EC2006)

Course Code	Course Outcome
CO_1	Explain the axiomatic formulation of probability theory to characterize the probability functions based on single random variables. [BL:2]
CO_2	Analyze various density and distribution functions and characteristic functions of random Variables. [BL:3]
CO_3	Explain the concepts of Multiple Random Variables and operations on Multiple Random variables. [BL:2]
CO_4	Explain the concept of stationary random processes to determine the temporal and spectral characteristics. [BL:2]

CO_5	Apply the concepts of random processes to study the linear systems under random phenomena.[BL:3]
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Course Name: Signals and Systems (20EC2007)

Course Code	Course Outcome
CO_1	Explain the basics of continuous time and discrete time signals and systems. [BL:2]
CO_2	Analyze the spectral characteristics of continuous-time periodic signals using Fourier Series.[BL:3]
CO_3	Apply Fourier transform for various Continuous and discrete time signals. .[BL:3]
CO_4	Analyze the effects of sampling on a continuous time signal. [BL:3]
CO_5	Apply the Laplace transform and Z- transform for analyze of continuous-time and discrete-time signals and systems. [BL3]

Course Name: Principles of Databases (20CS3005)

Course Code	Course Outcome
CO_1	Demonstrate the fundamental elements and the applications of database management system (BL-2)
CO_2	Analyze the integrity constraints for relevant problems in database system. (BL-4)
CO_3	Construct the SQL queries to create, manipulate and extract the information in database system (BL - 3)
CO_4	Illustrate the concept of Normalization to produce a good database design in database design process. (BL - 2)
CO_5	Demonstrate Transactions and concurrency control in maintaining the database's integrity in database Systems. (BL - 2)

Course Name: Analog Electronics Lab (20EC2503)

Course Code	Course Outcome
CO_1	Compare the performance of various amplifiers practically.[BL:2]
CO_2	Analyze negative feedback and tuned amplifier circuits.[BL:4]
CO_3	Estimate efficiencies of power amplifiers.[BL:5]

Course Name: MATLAB and Simulink Lab (20EC2504)

Course Code	Course Outcome
CO_1	Generate various signals and sequences using MATLAB.[BL:2]
CO_2	Execute arithmetic operations on signals and sequences. [BL:2]
CO_3	Analyze the autocorrelation and cross correlation of various signals.[BL:4]
CO_4	Estimate the frequency response of LTI systems using Fourier and Laplace Transforms.[BL:5]

Course Name: Analog and Digital Communications (20EC2008)

Course Code	Course Outcome
CO_1	Analyze the Analog modulation and demodulation systems. (BL-4)
CO_2	Analyze the effect of noise on the performance of communication system. (BL-2)
CO_3	Analyze the various Digital modulation techniques (BL-4)
CO_4	Apply the Amplitude, frequency and phase shift keying techniques (BL-3)
CO_5	Make use of the different error control codes for efficient transmission (BL-3)

Course Name: Linear IC Applications (20EC2009)

Course Code	Course Outcome
CO_1	Analyze the various characteristics of Differential amplifier. (BL: 4).
CO_2	Explain the characteristics and configurations of Op-amp (BL: 2).
CO_3	Explain the linear and non linear applications of an Op-amp (BL:2)
CO_4	Design the Oscillators and active filters using Op-amp (BL: 4).
CO_5	Explain the operation and applications of the special purpose integrated circuits and Data Convertors. (BL:2).

Course Name: Microprocessors and Microcontrollers (20EC2010)

Course Code	Course Outcome
CO_1	Interpret the working principles of 8086 Microprocessor .(BL-2)
CO_2	Analyze the Instruction formats and addressing modes 8086 processor.(BL-4)
CO_3	Demonstrate the features, architecture & addressing modes and instruction set of MSP 430.(BL-2)
CO_4	Analyze the modes of MSP 430. (BL-4)
CO_5	Illustrate the principles of serial communication interfaces used with MSP 430. (BL-2)

Course Name: Analog and Digital Communications Lab (20EC2505)

Course Code	Course Outcome
CO_1	Experiment with various analog modulation and demodulation techniques. [BL:3]
CO_2	Analyze different Pulse modulation techniques.[BL:4]
CO_3	Analyze digital modulation & demodulation techniques. [BL:4]
CO_4	Compare the performance of various shift keying techniques.[BL:5]
CO_5	Simulate all digital modulation and demodulation techniques using MATLAB.[BL:5]

Course Name: Microprocessors and Microcontrollers Lab (20EC2506)

Course Code	Course Outcome
CO_1	Execute assembly language programs using 8086 microprocessor.[BL:5]
CO_2	Examine interfacing and programming GPIO ports in C using MSP430.[BL:4]
CO_3	Design and implement MSP430 microcontroller based systems.[BL:4]