DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
COURSE OUTCOMES
BATCH 2017-2021(R16)

	S.No	Course Code	Code	Name of the Course
I YEAR SEM -I	1	MA101BS	C101	Mathematics-I
	2	CH102BS	C102	Engineering Chemistry
	3	PH103BS	C103	Engineering Physics-I
	4	EN104HS	C104	Professional Communication in English
	5	ME105ES	C105	Engineering Mechanics
	6	EE106ES	C106	Basic Electrical and Electronics Engineering
	7	EN107HS	C107	English Language Communication Skills Lab
	8	ME108ES	C108	Engineering Workshop
I YEAR SEM -II	9	PH201BS	C109	Engineering Physics-II
	10	MA202BS	C110	Mathematics-II
	11	MA203BS	C111	Mathematics-III
	12	CS204ES	C112	Computer Programming in C
	13	ME205ES	C113	Engineering Graphics
	14	CH206BS	C114	Engineering Chemistry Lab
	15	PH207BS	C115	Engineering Physics Lab
	16	CS208ES	C116	Computer Programming in C LAB
II YEAR SEM -I	17	MA301BS	C201	Mathematics-IV
	18	EC302ES	C202	Analog Electronics
	19	EC303ES	C203	Electrical Technology
	20	EC304ES	C204	Signals and Stochastic Process
	21	EC305ES	C205	Network Analysis
	22	EC306ES	C206	Electronic Devices and Circuits Lab

	23	EC307ES	C207	Basic Simulation lab
	24	EC308ES	C208	Basic Electrical Engineering Lab
II YEAR SEM -II	25	EC401ES	C209	Switching Theory and Logic Design
	26	EC402ES	C210	Pulse and Digital Circuits
	27	EE404ES	C211	Control Systems
	28	EC405ES	C212	Analog Communications
	29	SM405MS	C213	Business Economics and Financial Analysis
	30	EC406ES	C214	Analog Communications Lab
	31	EC407ES	C215	Pulse and Digital Circuits Lab
	32	EC408ES	C216	Analog Electronics Lab
III YEAR SEM -I	33	EC501PC	C301	Electromagnetic Theory and Transmission Lines
	34	EC502PC	C302	Linear and Digital IC Applications
	35	EC503PC	C303	Digital Communications
	36	SM504MS	C304	Fundamentals of Management
	37	CS511OE	C305	Operating Systems
	38	EC505PC	C306	Linear IC Applications Lab
	39	EC506PC	C307	Digital IC Applications Lab
	40	EC507PC	C308	Digital Communications Lab
III YEAR SEM -II	41	CS621OE	C309	Java Programming
	42	EC612PE	C310	Digital Image Processing
	43	EC601PC	C311	Antennas and Wave Propagation
	44	EC602PC	C312	Microprocessors and Microcontrollers
	45	EC603PC	C313	Digital Signal Processing
	46	EC604PC	C314	Digital Signal Processing Lab
	47	EC605PC	C315	Microprocessors and Microcontrollers Lab
	48	EN606HS	C316	Advanced English Communication Skills Lab

IV YEAR SEM -I	49	EC701PC	C401	Microwave Engineering
	50	EC721PE	C402	Computer Networks
	51	EC732PE	C403	Internet of Things
	52	EC744PE	C404	Artificial Intelligence
	53	EC702PC	C405	VLSI Design
	54	EC703PC	C406	VLSI and E-CAD Lab
	55	EC704PC	C407	Microwave Engineering Lab
	56	EC705PC	C408	Industry Oriented Mini Project
	57	EC706PC	C409	Seminar
IV YEAR SEM -II	58	CN831OE	C410	Remote Sensing and GIS
	59	EC853PE	C411	Optical Communications
	60	EC863PE	C412	Global Positioning System
	61	EC801PC	C413	Major project

Course Outcomes (COs)

Course Outcomes (Cos) of all subjects for the Batch 2017-2021

SEM: III	Subject Name:Mathematics IV (C201)
C201.1	Able to Analyze the complex functions with reference to their analyticity, integration using Cauchy's integral theorem
C201.2	Able to Find the Taylor's and Laurent's series expansion of complex functions
C201.3	Able to find the bilinear transformation
C201.4	Able to Express any periodic function in term of sines and cosines and non-periodic function as integral representation
C201.5	Able to Analyze one dimensional wave and heat equation

SEM: III	Subject Name: Analog Electronics(C202)
C202.1	Design and analyze small signal amplifier circuits applying the biasing techniques learnt earlier
C202.2	Cascade different amplifier configurations to obtain the required overall specifications like Gain, Bandwidth, Input and Output interfacing Impedances
C202.3	Analyze FET Amplifiers
C202.4	Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations
C202.5	Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio anradio applications for audio and Radio application

SEM: III	Subject Name:Electrical Technology(C203)
C203.1	Able to analyze the performance of dc generators and motors.
C203.2	Able to analyze the performance of transformers
C203.3	Able to learn the in-depth knowledge on three phase induction motors.
C203.4	Able to learn the Alternators
C203.5	Able to analyze the performance of special motors and electrical instruments in real time applications.

SEM III	Subject Name: Signals and Stochastic process(C204)
C204.1	Able to Represent any arbitrary analog or Digital time domain signal in frequency domain
C204.2	Able to Understand the importance of sampling, sampling theorem and its effects
C204.3	Able to Understand the characteristics of linear time invariant systems.

C204.4	Able to Determine the conditions for distortion less transmission through a system.
C204.5	Able to Understand the concepts of random process and its characteristics

SEM III	Subject Name:Network Analysis(C205)
C205.1	Able to Gain the knowledge on Basic network elements.
C205.2	Able to Learn and analyze the RLC circuits' behavior in detail.
C205.3	Able to Analyze the performance of periodic waveforms.
C205.4	Able to Learn and gain the knowledge in characteristics of two port network parameters (Z, Y, ABCD, h & g)
C205.5	Able to analyze the filter design concepts in real world applications.

SEM III	Subject Name: Electronics Devices and Circuits Lab(C206)
C206.1	Able to identify components and testing
C206.2	Able learn the characteristics of various active devices.
C206.3	Able to analyze various active devices
C206.4	Able to Apply various devices to real-time problems
C206.5	Able to Compute frequency response of various amplifiers

SEM III	Subject Name:Basic Simulation Lab(C207)
C207.1	Able to generate various signals and sequences and perform basic operations.
C207.2	Able to calculate convolution, correlation between signals and sequences.
C207.3	Able to understand the properties of LTI system.
C207.4	Able to apply the concepts FS, FT, LT, Z-T.
C207.5	Able to generate Gaussian noise and analyze the importance of random process. Verify sampling theorem.

SEM III	Subject Name:Basic Electrical Engineering lab(C208)
C208.1	To understand and verify the basic circuit theorems.
C208.2	Able to obtain the different parameters of two port network.

C208.3	Able to analyze the small electrical circuits.
C208.4	Able to obtain the efficiency and voltage regulation of transformer practically.
C208.5	Able to obtain the efficiency of DC machines AC machines

SEM III	Subject Name:Switching theory and logic design(C209)
C209.1	Be able to manipulate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray and BCD and to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra
C209.2	Be able to Minimize combinational functions and to design and analyze small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.
C209.3	Be able to design and analyze small sequential circuits and devices.
C209.4	Be able to use standard sequential functions/building blocks to build larger more complex circuits.
C209.5	Be able to use standard sequential functions/building blocks to build Moore and Mealy circuits.

SEM IV	Subject Name: Pulse And Digital circuits(C210)
C210.1	Able to Understand the applications of diode as integrator, differentiator and RLC circuits
C210.2	Able to Design and Analyze clipper , clamper circuits
C210.3	Learn various switching devices such as diode, transistor, SCR.
C210.4	Able to Design multivibrators for various applications, synchronization techniques and sweep circuits
C210.5	Able to Realizing logic gates using diodes and transistors. Difference between logic gates and sampling gates

SEM IV	Subject Name: Control Systems(C211)
C211.1	Apply various control strategies to different applications (example: Power systems electrical drives etc…)
C211.2	Apply various time domain techniques to assess the system performance
C211.3	Apply various Frequency domain techniques to assess the system performance
C211.4	Improve the system performance by selecting a suitable controller and/or a compensator for a specific application
C211.5	Test system Controllability and Observability using state space representation and applications of state space representation to various systems.

SEM IV	Subject Name:Analog Communications(C212)
C212.1	Able to analyze and design various modulation and demodulation analog systems
C212.2	Able to analyze SSB modulation.
C212.3	Able to understand and analyze angle modulation
C212.4	Able to Study of signal to Noise Ration (SNR) performance, of various Analog Communication systems and Understand the characteristics of noise present in analog systems
C212.5	Able to Analyze and design the various Pulse Modulation Systems and Understand the concepts of Multiplexing: Time Division Multiplexing (TDM) andFrequency Division Multiplexing (FDM).

SEM IV	Subject Name: Business Economics and financial analysis(C213)
C213.1	The students will understand the various forms of Business and the impact of economics variables on the Business.
C213.2	The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
C213.3	Able to analyze Production,Cost,Market Structure, Pricing aspects
C213.4	The Students can study the firm's financial position by analyzing the Financial Statements of a Company
C213.5	Able to understand concepts of ratio analysis

SEM IV	Subject Name: Analog communications lab(C214)
C214.1	able to understand the analog modulation and angle modulation concepts.
C214.2	able to analyze the pulse modulation schemes.
C214.3	able to understand the concepts of receivers.
C214.4	able to understand the spectrum of modulation schemes using spectrum analyzer.
C214.5	able to write the code for modulation schemes using MATLAB

SEM IV	Subject Name: Pulse and digital circuits lab(C215)
C215.1	Able to design the Linear and non linear wave shaping circuits
C215.2	Able to design the multivibrators
C215.3	Able to design Schmitt trigger and UJT Relaxation oscillator

C215.4	Able to understand the Output-Voltage waveform of Boot strap and Miller Sweep circuit
C215.5	Able to analyze the sampling gates and logic gates

SEM IV	Subject Name: Analog electronics lab(C216)
C216.1	Able to design different amplifiers using Hardware
C216.2	Able to design different feedback amplifier using Hardware
C216.3	Able to design oscillators using Hardware
C216.4	Able to design different amplifiers using Multisim Software
C216.5	Able to design oscillators using Multisim Software

SEM V	Subject Name: Electromagnetic theory and transmission lines(C301)
C301.1	Able to Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields
C301.2	Able to Get the knowledge of Basic Laws, Concepts and proofs related to Magneto static Fields and learn Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions
C301.3	Analyze the Wave Equations for good conductors and good dielectrics, and evaluate the UPW Characteristics for several practical media of interest. Establish the proof transmission coefficients for UPW propagation, distinguish between Brewster and estimate the polarization features, reflection and Critical Angles, and acquire knowledge of their applications.evaluate the UPW Characteristics for several practical media of interest.
C301.4	Determine the Transmission Line parameters for different lines, characterize the distortions and estimate the characteristics for different lines, Analyze the RF Line features and configure them as SC, OC Lines, QWTs and HWTs, and design the same for effective impedance transformation.
C301.5	Study the Smith Chart profile and stub matching features, and gain ability to practically use the same for solving practical problems.

SEM V	Subject Name: linear and digital IC applications(C302)
C302.1	Able to A thorough understanding of operational amplifiers with linear integrated circuits
C302.2	Able to understand the 555 Timer and IC565 PLL Applications
C302.3	Able to understand A to D and D to A converters
C302.4	Able to Understanding of the different families of digital integrated circuits and their characteristics.
C302.5	Able to Understand sequential logic families of digital integrated circuits

SEM V	Subject Name:Digital communications(C303)
C303.1	Able to Understand basic components of Digital Communication Systems
C303.2	Able to Design optimum receiver for Digital Modulation techniques.
C303.3	Able to Analyze the error performance of Digital Modulation Techniques
C303.4	Able to Understand the redundancy present in Digital Communication by using various source coding techniques.
C303.5	Able to Know about different error detecting and error correction codes like block codes, cyclic codes and convolution codes.

SEM V	Subject Name: Fundamentals of management(C304)
C304.1	The students understand the significance of Management in their Profession.
C304.2	Able to Analyze planning and decision making for the problem solving
C304.3	Able to understand organization design and structures
C304.4	To learn leadership qualities and motivational factors
C304.5	Able to understand the types of strategies for control

SEM V	Subject Name: Operating Systems(C305)
C305.1	Able to Apply optimization techniques for the improvement of system performance.
C305.2	Able to Ability to design and solve synchronization problems.
C305.3	Able to Learn about minimization of turnaround time, waiting time and response time and also maximization of throughput by keeping CPU as busy as possible
C305.4	Able to Ability to change access controls to protect files.
C305.5	Able to compare the different operating systems.

SEM V	Subject Name: Linear IC applications lab(C306)
C306.1	Able to design the applications of OPAMP using IC 741
C306.2	Able to design the applications of TIMERS using IC 555
C306.3	Able to design the voltage regulators using IC 723
C306.4	Able to design IC565 PLL Applications

C306.5	Able to Analyze the three terminal regulators

SEM V	Subject Name:Digital IC applications lab(C307)
C307.1	Able to design the functionality of Encoders
C307.2	Able to design the functionality of comparators and counters
C307.3	Able to design the functionality of multiplexers and adders
C307.4	Able to design the functionality of converters
C307.5	Able to design the functionality of shift registers

SEM V	Subject Name: Digital Communications lab(C308)
C308.1	Able to perform different modulation techniques
C308.2	Able to perform different shift keying techniques
C308.3	Able to study spectral characteristics of PAM,PWM and QAM
C308.4	Able to generate and detect DPSK and QPSK OFDM
C308.5	Able to generate and detect OFDM

SEM VI	Subject Name: Java Programming(C309)
C309.1	Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading
C309.2	Identify classes, abstract classes, objects, members of a class and the Relationships among them needed for a specific problem.
C309.3	Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling multithreaded applications with Synchronization).
C309.4	Develop programs using the Java Collection API as well as the Java standard class library.
C309.5	Develop the skills to apply java programming in problem solving and design GUI based applications)

SEM VI	Subject Name: Digital image processing(C310)
C310.1	Exploration of the limitations of the computational methods on digital images.

C310.2	Elaborate understanding on image enhancement techniques.
C310.3	Able to implement the spatial and frequency domain image transforms on Enhancement and restoration of images.
C310.4	Evaluate basic segmentation and morphological processing algorithms.
C310.5	Able to analyze the need for compression and evaluate the basic compression algorithms.

SEM VI	Subject Name:Antennas and wave propagation(C311)
C311.1	Able to Analyze the mechanism of radiation, distinguish between different antenna characteristic parameters, establish their mathematical relations, estimate them for different practical cases, Distinguish between short dipoles, half-wave dipoles, quarter-wave monopoles and small loops, configure their current distributions, derive their far fields and radiation characteristics and sketch their patterns
C311.2	Able to Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of folded dipole, Yagi-Uda Antenna, Helical Antennas, Horn Antennas, and to acquire the knowledge of their analysis, design and development.
C311.3	Able to Analyze a microstrip rectangular patch antenna and a parabolic reflector antenna, identify the requirements and relevant feed structure, carry out the design and establish their patterns.
C311.4	Able to Carry out the Linear Array Analysis, estimate the array factor and characteristics and sketch the pattern for 2-element array, N-element BSA, EFA, modified EFA, Binomial Arrays.
C311.5	Able to Classify the different wave propagation mechanisms, identify their frequency ranges, determine the characteristic features of ground wave, ionospheric wave, space wave, duct and tropospheric propagations, and estimate the parameters involved.

SEM VI	Subject Name: Microprocessors and microcontrollers(C312)
C312.1	Able to Understands the internal architecture, organization and assembly language programming of 8086 processors
C312.2	Able to Understands the internal architecture, organization and assembly language programming of 8051/controllers
C312.3	Able to Understands the interfacing techniques to 8086 and 8051 based systems
C312.4	Able to Understands the internal architecture of ARM processors.
C312.5	Able to Understands Architecture of advanced ARM processors

SEM VI	Subject Name:Digital signal processing(C313)
C313.1	Able to Perform time, frequency, and Z -transform analysis on signals and systems.
C313.2	Able to Understand the inter-relationship between DFT and various transforms.
C313.3	Able to Understand the significance of various filter structures and effects of round off errors.

C313.4	Able to Design a digital filter for a given specification.
C313.5	Able to Understand the fast computation of DFT and appreciate the FFT processing

SEM VI	Subject Name:Digital signal processing lab(C314)
C314.1	Able to generate discrete time signals/ waveforms.
C314.2	Able to understand the importance of frequency domain by evaluating DFT,FFT,power Spectrum
C314.3	Able to Implement IIR and FIR digital filters
C314.4	Able to understand the importance of multi-rate signal processing.
C314.5	Able to plot frequency response and impulse response of first order and second order systems. Able to do noise removal

SEM VI	Subject Name: Microprocessor and microcontrollers lab(C315)
C315.1	Able to Apply the fundamentals of assembly level programming of microprocessors
C315.2	Able to develop the assembly level programming using 8086 instruction set.
C315.3	Able to Analyze abstract problems and apply a combination of hardware and software to address the problem
C315.4	Able to Contrast how different I/O devices can be interfaced to processor and will explore several techniques of interfacing
C315.5	Able to Experiment with standard microprocessor interfaces including GPIO, serial ports, digital-to-analog converters and analog-to-digital

SEM VI	Subject Name: Advanced English communication lab(C316)
C316.1	Able to Acquire vocabulary and use it contextually
C316.2	Able to Listen and speak effectively
C316.3	Able to Develop proficiency in academic reading and writing
C316.4	Able to Increase possibilities of job prospects
C316.5	Able to Communicate confidently in formal and informal contexts

SEM VII	Subject Name:Microwave Engineering(C401)
C401.1	Able to understand significance of microwaves, analyze the transmission lines, wave guides and micro strip lines for microwaves and applications

C401.2	Able to analyze cavity resonators and waveguide components with applications
C401.3	Able to summarize the significance of microwave tubes, analyze the characteristics of microwave tubes and compare them.
C401.4	Able to analyze the operation of magnetron and microwave solids state devices.
C401.5	Able to understand the scattering matrix parameters and its uses, Gain the knowledge on microwave test bench for measuring the different parameters

SEM VII	Subject Name: Computer Networks(C402)
C402.1	Able to understand and explore the basics of Computer Networks and various protocols. He/She will be in a position to understand the world wide concepts.
C402.2	Able to describe a network and flow of information further he/she can understand easily the concepts of network security, mobile and ad hoc networks.
C402.3	Able to explain master the terminology and concepts of the OSI reference model and the TCP/IP reference model.
C402.4	Able to master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks
C402.5	Able to explain wireless networking concepts

SEM VII	Subject Name:Internet of things(C403)
C403.1	Understand the Building blocks of IoT, Characteristics and Application Areas of IoT.
C403.2	Understand IoT and M2M communication Modules.
C403.3	Able to Design IoT through Python Programming.
C403.4	Explore and learn about Internet of Things with the help of preparing projects designed for Raspberry Pi.
C403.5	Understanding of IoT value chain structure (device, data cloud), and application involved.

SEM VII	Subject Name: artificial intelligence(C404)
C404.1	Able to learn the distinction between optimal reasoning Vs. human like reasoning
C404.2	able to understand increase the production, utilization of the resources and measure the quality of products.
C404.3	Able to learn different knowledge representation techniques.
C404.4	To understand the applications of AI, namely game playing, theorem proving, and machine learning.
C404.5	Able to Analyze inventory management, handling of the materials, market situations with compare PLC and utilization of the distribution channels

SEM VII	Subject Name:VLSI design(C405)
C405.1	Able to learn qualitative knowledge about the fabrication process of integrated circuitusing MOS transistors.
C405.2	Able to Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit
C405.3	Able to Draw the layout of any logic circuit which helps to understand and estimate parasitic of any logic circuit
C405.4	able to design concepts required to design building blocks of data path using gate.And Design simple memories using MOS transistors and can understand design of large memories.
C405.5	Able to Design simple logic circuit using PLA, PAL, FPGA and CPLD. Understand differenttypes of faults that can occur in a system and learn the concept of testing and adding extrahardware to improve testability of system

SEM VII	Subject Name:VLSI and E-CAD lab(C407)
C407.1	Design Different Combinational Circuits using HDL.
C407.2	Design Different Sequential Circuits using HDL.
C407.3	Design Finite State Machines using HDL.
C407.4	To verify Physical Design of Logic Gates and Flip-Flops.
C407.5	Design Layouts of CMOS based Logic Gates.

SEM VII	Subject Name: Microwave engineering lab (C407)
C407.1	Able to plot the characteristics of reflex klystron oscillator.
C407.2	Able to plot the characteristics of Gunn oscillator
C407.3	Able to evaluate the frequency and wavelength ofgiven microwave signal
C407.4	Able to evaluate scattering parameters of acirculator, magic tee and Directional coupler
C407.5	Able to evaluate attenuation,VSWR and impedance of given load

SEM VII	Subject Name: industrial oriented mini project(C408)
C408.1	Students will be able to practice acquired knowledge within the chosen area of technology for project development.
C408.2	Able to Find the Taylor's and Laurent's series expansion of complex functions
C408.3	Able to find the bilinear transformation

C408.4	Able to Express any periodic function in term of sines and cosines and non-periodic function as integral representation
C408.5	Able to Analyze one dimensional wave and heat equation.

SEM VII	Subject Name: Seminar(C409)
C409.1	Establish motivation for any topic of interest and develop a thought process for technical presentation.
C409.2	Organize a detailed literature survey and build a document with respect to technical publications.
C409.3	Analysis and comprehension of proof-of-concept and related data. Establish motivation for any topic of interest and develop a thought process for technical presentation.
C409.4	Effective presentation and improve soft skills.
C409.5	Make use of new and recent technology (e.g. overleaf) for creating technical reports

SEM VIII	Subject Name: Remote sensing and GIS(C410)
C410.1	Retrieve the information content of remotely sensed data
C410.2	Analyze the energy interactions in the atmosphere and earth surface features
C410.3	Interpret the images for preparation of thematic maps Apply problem specific remote sensing data for engineering applications
C410.4	Analyze spatial and attribute data for solving spatial problems
C410.5	Create GIS and cartographic outputs for presentation

SEM VIII	Subject Name: Opticalcommunications(C411)
C411.1	To realize the significance of optical fiber communications
C411.2	To understand the construction and characteristics of optical fiber cable.
C411.3	To develop the knowledge of optical signal sources and power launching.
C411.4	To identify and understand the operation of various optical detectors
C411.5	To understand the design of optical systems and WDM.

SEM VIII	Subject Name:Global positioning system(C412)
C412.1	Able to understand different types of GPS architectures

C412.2	Able to Analyze the Signals received by GPS
C412.3	Able to Analyze the Errors occurred at GPS Receivers.
C412.4	Able to understand differential GPS.
C412.5	Able to Utilize the Services of GPS.

SEM VIII	Subject Name:Major Project(C413)
C413.1	To create an Industrial environment and culture within the institution.
C413.2	To set up production lab utilizing the infrastructure of the institution.
C413.3	To standardize laboratories to industrial standard, thereby giving exposure to industrial housekeeping standards.
C413.4	To provide students hands on experience on, troubleshooting, maintenance, fabrication, innovation, record keeping, documentation etc thereby enhancing the skill and competency part of technical education.
C413.5	To promote the concept of entrepreneurship.