BVRIT HYDERABAD

College of Engineering for Women

Department of Electronics and Communication Engineering

AY:2021-22 – I Sem

II Year I Sem – R18			
Course Code	**Course Name**	**CO. No.**	**Course Outcomes**
C211	EDC	C211.1	Analyze the construction, principle of operation and characteristics of PN junction diode.
		C211.2	Differentiate various types of diodes and their applications.
		C211.3	Design biasing circuits to maintain a stable operating point based on given specifications.
		C211.4	Choose appropriate BJT configuration for a given application.
		C211.5	Evaluate the characteristics of BJT and FET devices.
		C211.6	Analyze the amplifier configurations of BJT and FET devices using h parameters.
C212	NA & TL	C212.1	Analyze the network topologies with electrical components
		C212.2	Analyze the steady state and transient response of RLC circuits
		C212.3	Illustrate the characteristics of two port network parameters
		C212.4	Design attenuators and impedance matching networks
		C212.5	Evaluate various transmission line parameters
		C212.6	Analyze Transmission line using Smith Chart with impedance considerations
C213	DSD	C213.1	Apply the concepts of number systems, codes and Boolean algebra to simplify logic expressions.
		C213.2	Design simple combinational logic circuits.
		C213.3	Apply minimization techniques for optimizing combinational logic.
		C213.4	Design and analyze simple sequential circuits
		C213.5	Apply minimization techniques for sequential circuits
		C213.6	Realize logic gates using diodes and transistors
C214	SS	C214.1	Analyze the orthogonality of signals
		C214.2	Analyze the Spectral characteristics of Periodic and aperiodic continuous signals
		C214.3	Apply sampling theorem in analog to digital signal conversion.

		C214.4	Analyze the signal transmission through linear time invariant systems.
		C214.5	Apply the concepts of convolution and correlation in signal and system analysis
		C214.6	Analyze continuous and discrete-time signals and systems using Laplace and Z Transforms respectively
C215	PTSP	C215.1	Apply the concepts of probability theory to solve probabilistic problems.
		C215.2	Analyze various distribution and density functions of a random variable.
		C215.3	Estimate various parameters of a random variable multiple random variables
		C215.4	Analyze the temporal and spectral characteristics of stochastic processes.
		C215.5	Analyze the characteristics and modelling of various noise sources
		C215.6	Analyze various Source coding techniques and related laws
C216	EDC Lab	C216.1	Analyze the characteristics of different practical diodes.
		C216.2	Construct electronic circuits for various applications using diodes.
		C216.3	Analyze the characteristics of different Transistor configurations.
		C216.4	Design amplifier circuits for a given specification.
C217	DSD Lab	C217.1	Implement Boolean Expressions using universal logic gates
		C217.2	Design and verify Combinational logic circuits using IC's
		C217.3	Design and verify Sequential logic circuits using IC's
		C217.4	Implement Counters & Shift registers using FF's
C218	BS Lab	C218.1	Perform various operations on signals
		C218.2	Verify the properties of LTI system and its response for different inputs.
		C218.3	Analyze the signals using various transforms
		C218.4	Analyze the characteristics of signals in noisy environment.
III Year I Sem – R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C311	MPMC	C311.1	Differentiate architectural features and modes of operation of 8086 microprocessor and 8051 microcontrollers.
		C311.2	Summarize the addressing modes, instruction set and assembler directives of 8086 Microprocessor and 8051 Microcontroller.
		C311.3	Write assembly language programs for 8086 Microprocessor and 8051 Microcontroller.

		C311.4	Interface various peripheral devices and memory with 8051 microcontrollers.
		C311.5	Analyze the architectural features and instruction set of ARM processor
		C311.6	Explain the architectural feature of CORTEX and OMAP processors
C312	Data Communication and Networks	C312.1	Analyze the Categories and functions of various Data communication Networks
		C312.2	Design and analyze various error detection techniques.
		C312.3	Demonstrate the mechanism of routing the data in network layer
		C312.4	Analyze the significance of various Flow control and Congestion control Mechanisms
		C312.5	Analyze the Functioning of various Application layer Protocols.
		C312.6	Analyze the features and operations of various user interface protocols.
C313	CS	C313.1	Evaluate the types of control systems for real time applications.
		C313.2	Compute transfer function of a system by different techniques.
		C313.3	Evaluate the time response of systems for standard input signals.
		C313.4	Probe the stability of a system using time and frequency domain approach
		C313.5	Examine the performance of systems with compensators and controllers
		C313.6	Construct state models for continuous & discrete time systems and Comment on controllabity and observability of the system
C314	BEFA	C314.1	Understand the Economic Concepts in business decision making process.
		C314.2	Familiarize with the cost concepts, market structures.
		C314.3	Make use of breakeven analysis, CVP Analysis, pricing strategies.
		C314.4	Examine financial accounting and analyze various financial statements.
		C314.5	Interpret various financial statements by applying different types of ratios.
		C314.6	Examine the usefulness of funds flow statement and cash flow statement for better managerial decisions.
C315	Professional Elective-I CO&OS	C315.1	Examine the Basic structure of a digital computer and the organization of different blocks in a computer using Micro Operations
		C315.2	Use of micro-level operations to control different Units in a computer and analyze the concept of Memory system.

		C315.3	Examine the organization of the I/O peripheral devices.
		C315.4	Analyze the Operating system functions, types, system calls.
		C315.5	Demonstrate the memory management techniques impact on architecture of computer design and Principals of Deadlock.
		C315.6	Examine file system implementation and its interface.
C316	Professional Elective-I ECC	C316.1	Calculate various information parameters and explain the types of errors and control strategies
		C316.2	Explain error detection and correction mechanism of linear block codes and its applications
		C316.3	Design cyclic codes for error detection
		C316.4	Implement encoding and decoding techniques of Convolution codes
		C316.5	Elucidate encoding and decoding process of Turbo codes and its applications
		C316.6	Describe the concepts of space time codes
C317	Professional Elective-I EMI	C317.1	Illustrate the characteristics and operating principles of measuring systems.
		C317.2	Summarize the construction and operation of various Wave Analyzers and Signal generators.
		C317.3	Analyze the working principles and applications of different types of Oscilloscopes
		C317.4	Measure R, L and C values using different bridge circuits.
		C317.5	Utilise transducers to compute various electrical parameters.
		C317.6	Make use of measuring devices to measure different physical parameters
C318	MPMC Lab	C318.1	Debug 8086 assembly language programs using macro assembler.
		C318.2	Write 8051 assembly language programs for simple arithmetic and logical operations and verify using Keil IDE.
		C318.3	Write 8051 assembly language programs to configure various peripheral devices and verify using Keil IDE.
		C318.4	Interface various input/output devices to 8051 microcontroller using development kit.
C319	Data Communications & Networks lab	C319.1	Create and evaluate the performance of various LAN topologies
		C319.2	Evaluate the performance of queue management, scheduling mechanisms and protocols
		C319.3	Evaluate the performance of routing protocols and IEEE 802.x standards.
		C319.4	Analyze various protocols using packet capture monitoring tools.

C31A	ACS Lab	C31A.1	Build sound vocabulary and use functional English effectively
		C31A.2	Analyze the given text and respond appropriately and develop efficacious writing skills
		C31A.3	Develop effective speaking skills and maximize job prospects
		C31A.4	Plan and make different forms of presentation using various techniques
C32A	Intellectual Property Rights	C32A.1	Discuss the fundamental aspects of Intellectual property Rights which play a major role in development and management of innovative projects in industries.
		C32A.2	Examine Trademarks, Acquisition of Trade Mark Rights and its registration processes.
		C32A.3	Evaluate various aspects relating to copyrights and its procedure for registration processes.
		C32A.4	Evaluate with the Trade Secret Law, protection for submission, Unfair Competition
		C32A.5	Evaluate on the International Developments in Intellectual Property Rights
		C32A.6	Interpret about current trends in IPR and the steps taken by the Government of India in fostering IPR
IV Year I Sem – R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C411	MW&OC	C411.1	Analyze the characteristics of O-type and M-type microwave tubes
		C411.2	Illustrate the operation of various solid state devices
		C411.3	Examine various waveguide components and their applications.
		C411.4	Estimate S-parameters of multiport junction devices
		C411.5	Measure various parameters using microwave bench
		C411.6	Understand an optical fiber communication system
C412	Professional Elective – III ANN	C412.1	Infer the similarity of Biological networks and Neural networks
		C412.2	understand the architecture and learning algorithms
		C412.3	Perform the training of neural networks using various learning rules.
		C412.4	Analyze the concepts of backward propagations.
		C412.5	Applying SOM for computer simulation.

		C412.6	Analyze and construct the Hopfield models.
C413	Professional Elective – III SL	C413.1	Make use of resources to gain some fluency programming in Linux, Perl, TCL/TK, Python
		C413.2	Elaborate about Known about basics of Linux and Linux Networking.
		C413.3	Understanding the Perl by utilizing the features
		C413.4	Explain various features of TCL Scripting
		C413.5	Examine the TK by embedding in different ways
		C413.6	Elaborate features of Python
C414	Professional Elective – III DIP	C414.1	Explain the fundamentals of digital image processing
		C414.2	Analyze the digital image using different image transforms
		C414.3	Apply spatial and frequency domain filtering techniques for image enhancement
		C414.4	Estimate the original image from a noisy one using different approaches in image restoration
		C414.5	Examine different types of discontinuities using image segmentation algorithms
		C414.6	Apply Morphological operations and compression techniques on different images
C415	Professional Elective – IV BMI	C415.1	Characterize bio potential signals.
		C415.2	Analyse the biomedical signal sources and related equipment
		C415.3	Illustrate cardiovascular system and its measurements.
		C415.4	Distinguish Neurological measuring Instruments.
		C415.5	Evaluate different Therapeutic equipment and Respiratory Instrumentation systems
		C415.6	Describe the different medical principles for medical imaging.
C416	Professional Elective – IV DBMS	C416.1	Demonstrate the basic elements of a database management system and the conceptual design of databases with the help of Entity-Relationship model.
		C416.2	Construct Relational Model by converting Entity-Relationship Model
		C416.3	Apply SQL queries for database management.
		C416.4	Apply normalization on schema to reduce data redundancy and increase data consistency.
		C416.5	Test transaction, concurrency control models and recovery mechanisms on database.
		C416.6	Classify different storage devices and indexing methods.
C417		C417.1	Illustrate the concepts and principles of security Attacks, Services and Mechanisms.

	Professional Elective – IV NSC	C417.2	Evaluate applications of Cryptographic algorithms in real time scenarios.
		C417.3	Apply various public key cryptography techniques
		C417.4	Demonstrate the techniques like Message authentication, Hash function and Authentication applications.
		C417.5	Assess different key management techniques and solutions for web security.
		C417.6	Analyze various case studies to identify the security vulnerabilities and prevention techniques.
C418	Open Elective II- Data Structures	C418.1	Implement various operations on linear data structures to solve real world problems.
		C418.2	Design solutions using Dictionaries and Hash Tables.
		C418.3	Implement various kinds of trees and their operations.
		C418.4	Represent graphs and traverse them.
		C418.5	Choose appropriate sorting algorithm.
		C418.6	Examine Pattern matching algorithms and Tries.
C419	PPLE	C419.1	Understand the Professional Practice and Ethics needed for Engineering Professionals.
		C419.2	Familiarize the various concepts in Law of Contract.
		C419.3	Analyse the challenges of Law and its judicial interventions.
		C419.4	Develop essential Strategies for protection of Labour and Labour related Laws.
		C419.5	Evaluate the Law relating to different types of Intellectual Property.
		C419.6	Apply the various issues relating to the professional practice, law and ethics aimed for overall development for a citizen, society.
C41A	MW&OC Lab	C41A.1	Analyse the characterises of microwave sources
		C41A2	Measure the parameters of the various microwave components
		C41A.3	Analyse the characterises of optical sources
		C41A.4	Measure the various parameters of the optical communication system
C41B	Seminar	C41B.1	Identify emerging topic specific to the programme.
		C41B.2	Extract the information relevant to the chosen topic.
		C41B.3	Deliver the knowledge using multimedia.
		C41B.4	Answer the queries with appropriate explanation and elaboration.
		C41B.5	Compile an effective technical report, providing conclusions and proposing an appropriate future

			scope.
C41C	Project Stage-1	C41C.1	Identify the problem, conduct literature survey and formalize it.
		C41C.2	Analyze the problem & propose cost-effective and eco-friendly solution using relevant tools
		C41C.3	Prepare the design plan with appropriate time lines.
		C41C.4	Demonstrate effective communication and report writing Skills.
		C41C.5	Recognise the need for team work and demonstrate professional ethics.

AY:2021-22 - II Sem

II Year II Sem – R18		
Course Name	**CO No.**	**Course Outcomes**
LTNM&CV	C221.1	Apply Laplace Transforms to solve ordinary differential equations
	C221.2	Estimate unknown values for a given data using Interpolation and method of least squares.
	C221.3	Apply numerical methods to solve algebraic and transcendental equations.
	C221.4	Apply numerical methods to evaluate definite integrals and solve initial value problems.
	C221.5	Analyze the complex functions with reference to their analyticity
	C221.6	Apply the knowledge of complex functions to evaluate various integrals.
EMFW	C222.1	Apply the laws of electrostatics for different types of charge distributions
	C222.2	Apply the laws of magneto-statics for different types of current distributions
	C222.3	Analyze boundary conditions using Maxwell's equations at different media interfaces
	C222.4	Examine the propagation of EM waves in different media
	C222.5	Analyze the reflection and refraction of plane waves in dielectrics.
	C222.6	Compare various modes of microwave transmission lines.
ADC	C223.1	Analyze various modulation/demodulation techniques of amplitude modulation.
	C223.2	Explain various modulation / demodulation techniques of angle modulation.
	C223.3	Classify various types of transmitters and receivers used in AM and FM
	C223.4	Analyze different types of pulse modulation techniques and multiplexing schemes.
	C223.5	Demonstrate the error representation mechanism in various PCM techniques
	C223.6	Analyze different types of digital modulation techniques and optimal reception of signal
LICA	C224.1	Describe the fundamentals of integrated circuits and Op-Amp
	C224.2	Design Op-Amp circuits for basic applications.
	C224.3	Choose appropriate regulator based on the type of application
	C224.4	Design filters and oscillators using Op-Amp
	C224.5	Use IC 555 and IC 565 for different analog applications.

	C224.6	Differentiate between various types of data converters.
ECA	C225.1	Build different types of multistage amplifiers.
	C225.2	Analyze high frequency response of BJT amplifiers
	C225.3	Categorize different feedback amplifier circuits
	C225.4	Design various types of power and tuned amplifiers for specific applications
	C225.5	Design multivibrators for various applications
	C225.6	Design time-based generators using various techniques
ADC Lab	C226.1	Analyze the spectrum of various analog modulation techniques
	C226.2	Design a multiplexing system using FDM
	C226.3	Examine various pulse modulation techniques
	C226.4	Analyze different digital modulation and demodulation schemes
ICA Lab	C227.1	Design analog circuits for practical applications using Op Amp IC-741
	C227.2	Design waveform generators and PLL circuits using ICs
	C227.3	Design multi vibrators using IC555 and Schmitt trigger using IC741
	C227.4	Analyze the practical applications of Voltage Regulator using various ICs.
ECA Lab	C228.1	Design, simulate and verify basic amplifier circuits.
	C228.2	Design, simulate and verify feedback amplifiers and oscillators.
	C228.3	Design, simulate and verify power amplifier circuits.
	C228.4	Design, simulate and verify Multivibrators and Sweep Circuits.
GS Lab	C229.1	Develop a better understanding of important issues related to gender in contemporary India.
	C229.2	Analyze basic dimensions of the biological, sociological, psychological and legal aspects of gender.
	C229.3	Develop a sense of appreciation of women in all walks of life and will be equipped to work and live together as equals.
	C229.4	Examine the new laws for women protection & relief, and empower students to understand and respond to gender violence.

III Year II Sem – R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**

C321	Antennas and Propagation	C321.1	Apply the basic concepts of various antenna parameters like antenna pattern, radiation intensity, directivity, etc in antenna design.
		C321.2	Analyze radiation pattern of linear wire antennas
		C321.3	Examine the geometry of various types of antennas.
		C321.4	Design different antenna arrays for improving the gain in desired direction.
		C321.5	Measure antenna parameters to assess antenna's performance.
		C321.6	Analyze the characteristics of wave propagation in different layers of atmosphere.
C322	DSP	C322.1	Determine the behavior of LTI systems by solving difference equation
		C322.2	Understand the concepts of multi rate digital signal processing
		C322.3	Analyze digital signals in frequency domain using DFS and DFT
		C322.4	Compute DFT using FFT algorithms
		C322.5	Design and implement IIR and FIR digital filters
		C322.6	Analyze the effects of finite word length representation
C323	VLSI Design	C323.1	Summarize the steps in VLSI fabrication process of different MOS Technologies
		C323.2	Examine the electrical properties and models of CMOS circuits.
		C323.3	Construct layouts using stick diagrams in accordance with the design rules.
		C323.4	Implement complex digital logic circuits using switch logic and PLDs.
		C323.5	Build different VLSI subsystems using CMOS logic.
		C323.6	Explore the concept of testing and fault tolerant systems.
C324	Professional Elective-II OOP Through Java	C324.1	Develop programs using OOP concepts in Java
		C324.2	Choose use of Interfaces, Abstract classes and packages for Java applications
		C324.3	Choose I/O functionality to read from and write to text files
		C324.4	Analyze multithreading and exception handling mechanism for java applications
		C324.5	Employ Collections in Java Application to store and Manipulate the data
		C324.6	Construct GUI applications using Applet, AWT and Swings
C325	Professional Elective-II MCN	C325.1	Understand various techniques that improves the efficiency of cellular communication system
		C325.2	Design an effective cellular system considering the effects of co-channel and non co-channel interferences

		C325.3	Explore the factors that affect signal coverage in various contours
		C325.4	Understand the concepts of frequency management and effective channel assignment
		C325.5	Assimilate the concept of handoff mechanism and dropped call
		C325.6	Elucidate the concept of Adhoc networks and design goals of MAC layer
C326	Professional Elective-II ESD	C326.1	Distinguish the embedded systems from general purpose processing systems.
		C326.2	Recommend suitable hardware for different applications of embedded systems.
		C326.3	Select different types and amount of memory based on embedded system specifications.
		C326.4	Explain the Embedded firmware design approaches, development languages and device drivers
		C326.5	Analyze the issues and techniques of Task synchronization and communication in embedded firmware.
		C326.6	Differentiate between general purpose operating systems and RTOS.
C327	Open Elective-1 Fundamentals of Management for Managers	C327.1	Understand the concept of Management and its significance.
		C327.2	Analyse different Organizational Structures to meet contemporary challenges in Human Resource Management.
		C327.3	Analyse and Study different principles in Operations Management.
		C327.4	Evaluate and Understand Marketing Management and Supply Chain Strategies.
		C327.5	Develop Project Management Techniques to estimate the optimal cost of the project.
		C327.6	Understand and explore Contemporary Management Practices in their domain area of Engineering.
C327	Open Elective-1 Entrepreneurship	C327.1	Understand the ability to discern distinct entrepreneurial traits for entrepreneurial development.
		C327.2	Familiarize the concept of Establishing New Ventures.
		C327.3	Analyse the challenges of MSMEs and Rehabilitation of sick units.
		C327.4	Develop essential Marketing Strategies for Pricing, Service and Branding.
		C327.5	Evaluate the Strategic perspectives in Entrepreneurship.
		C327.6	Apply the Entrepreneurial mindset to become a successful Entrepreneur.
C328	DSP Lab	C328.1	Generate sinusoidal and noise waveforms using different approaches.
		C328.2	Analyze Impulse and frequency response of various digital filters.
		C328.3	Verify different algorithms of DSP through simulation.

		C328.4	Implement various DSP algorithms in hardware.
C329	e-CAD Lab	C329.1	Verify the functionality of digital circuits using Xilinx ISIM simulator
		C329.2	Implement digital circuits on various FPGA boards using Xilinx tools
		C329.3	Design layout for digital circuits and perform physical verification
		C329.4	Analyze static timing, IR drop and crosstalk in digital circuit layouts
C32A	Scripting Languages Lab	C32A.1	Design and test programs to solve mathematical problems
		C32A.2	Develop programs Using Ruby Script
		C32A.3	Develop Programs Using TCL Script
		C32A.4	Develop Programs Using Perl Script
C32B	Environmental Science	C32B.1	Discover knowledge regarding environment and its components.
		C32B.2	Understand the classification, importance and conservation of natural resources.
		C32B.3	Perceive the knowledge regarding different Bio -Geo classification of India.
		C32B.4	Examine impacts of pollution on the environment and their control measures.
		C32B.5	Analyze Environmental laws and Environmental Impact Assessments.
		C32B.6	Determine sustainable development that aims to meet raising human needs.
IV Year II Sem – R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C421	Professional Elective –V SC	C421.1	Demonstrate the principles of satellite communication systems
		C421.2	Design a satellite link for specified C/N ratio
		C421.3	Analyze the effects of propagation on satellite signals.
		C421.4	Analyze the performance efficiency of various multiple access techniques.
		C421.5	Explain Earth station technology and GPS.
		C421.6	Analyze the satellite packet communications
C422	Professional Elective –V RS	C422.1	Analyze the performance of Radar System and its parameters.
		C422.2	Analyze the functionality of CW and FMCW radar.
		C422.3	Classify the mechanism of detecting stationary and moving targets

		C422.4	Compare the working mechanism of various tracking radars.
		C422.5	Analyze the radar signal in noisy environment.
		C422.6	Assess various components and parameters of Radar receivers
C423	Professional Elective –V WCN	C423.1	Acquire knowledge about sensor networks, its types and applications
		C423.2	Understand issues, challenges and technologies of wireless sensor networks
		C423.3	Understand the various routing and MAC protocols
		C423.4	Apply various data dissemination methods for sensor networks
		C423.5	Understand the design principles of WSN and communication strategies
		C423.6	Understand the requirement of hardware and software to implement WSN
C424	Professional Elective –VI SoC	C424.1	Illustrate the Features and Components of System Architecture
		C424.2	Choose the suitable processor for SoC design
		C424.3	Examine different memory organization and interfacing techniques in SoC
		C424.4	Interpret the Cache organization in SoC Memory Design
		C424.5	Investigate the methods of interconnection and SoC customization
		C424.6	Analyze reconfiguration strategies used in SoC design
C425	Professional Elective –VI T&T	C425.1	Identify the need for testing and categorize the different problems involved in testing
		C425.2	Summarize types of faults and choose appropriate fault models.
		C425.3	Illustrate the methods for test generation in combinational circuits
		C425.4	Analyze the pseudo random test pattern generation techniques using Linear Feedback Shift Registers and Cellular Automata.
		C425.5	Categorize DFT techniques for combinational circuits
		C425.6	Illustrate the methods for test generation in sequential circuits
C426	Professional Elective –VI Low Power VLSI Design	C426.1	Summarize various sources of power dissipation in low power circuits
		C426.2	Illustrate the need for low power circuit design and analyze the effects of short channel
		C426.3	Categorize the special techniques to mitigate the power consumption in VLSI circuits
		C426.4	Analyze the architectural approaches to design low power, low voltage adder and multiplier circuits
		C426.5	Interpret the performance of low power, low voltage memory architectures

		C426.6	Compare different technology trends for low voltage low power logic styles
C427	Open Elective – III MAD	C427.1	Understands the working of Android OS Practically.
		C427.2	Develop Android user interfaces.
		C427.3	Develop, deploy and maintain the Android Applications.
		C427.4	Build a native application using GUI components and Mobile application development framework.
		C427.5	Develop an application using basic graphical primitives and databases
		C427.6	Model new applications to hand held devices.
C428	Project Stage-2	C428.1	Implement the project plan complying with deadlines
		C428.2	Validate the design to meet the specifications
		C428.3	Evaluate the results to derive the conclusion and provide scope for future enhancement.
		C428.4	Integrate Information from multiple sources and write a comprahensive report
		C428.5	Demonstrate technical, interpersonal and leadership skills in a team