2018 Scheme

Sl.No	Branch	Sem	Subject	CO,S
1	ECE	3	Transform Calculus, Fourier Series and Numerical Techniques Mathematics (18MAT31)	1. Use the knowledge of Laplace and inverse Laplace transform in solving differential/integral equations arising in network analysis, control system and other fields of Engineering.
				2. Apply the concept of Fourier series, Fourier transform and their application in communication system and digital signal processing and Z- transform in the field of signals and systems
				3. Solve first order and 2 nd order Differential equation by adopting Numerical methods
				4. Examine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis problems
2		3	Network Theory (18EC32)	1. Apply suitable techniques and theorems to compute currents and voltages in electrical networks.
				2. Analyse electrical networks under transient conditions.
				3. Apply Laplace Transform to compute network parameters

				4. Design the resonant circuits and two port networks using related parameters.
				5. Simulate the electrical networks using simulator software to verify the solutions to networks.
3		3	Electronic Devices (18EC33)	1. Understand the basic principles and characteristics of semiconductor diodes.
				2. Apply the basic knowledge of semiconductor devices in the design of BJT
				3. Apply the basic principles of semiconductors in the design of FETs and also to determine the characteristics and behaviour of LDR, Photodiode and determination of resistance using various bridges
				4. Apply the principles of semiconductors physics in the fabrication process.
4		3	Digital System Design (18EC34)	1. Explain the concept of combinational and sequential logic circuits
				2. Design the combinational logic systems.
				3. Design the sequential circuits using SR, JK, D,T flip flops and mealy & moore machines.
				4. Design applications of combinational & sequential circuits.
5		3	Computer Organization & Architecture (18EC35)	1. Explain the basic organisation of computer systems.
				2. Apply the basic concept of programming in designing simple programs
				3. Identify different types of semiconductor and other secondary storage memories.
				4. Conduct a detailed study on various Microprocessor systems.
6		3	Power Electronics & Instrumentation (18EC36)	1. Understand the principle of operation and characteristics of SCR and UJT

				2. Apply the basic principles of SCRs in designing converter/inverter circuits
				3. Apply principles of measuring instruments to understand different measuring instruments
				4. Apply basic knowledge of instrumentation in understanding transducers and PLCs
7		3	Electronic Devices & Instrumentation Laboratory (18ECL37)	1. Design and study different applications of diode.
				2. Demonstrate the characteristics of Zener diode, LDR, photo diode and SCR.
				3. Verify the characteristics and applications of SCR and LDR.
				4. Simulate the characteristics of semiconductor devices using PSpice EDA.
8		3	Digital System DesignLaboratory (18ECL38)	1. Demonstrate the truth table of various expressions and combinational circuits using Logic gates
				2. Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers
				3. Design Flip flops, counters and shift registers
				4. Simulate Serial adder and Binary Multiplier
10		4	Complex Analysis, Probability And Statistical Methods (18MAT41)	1. Remember the concept of probability to solve the problems on probability distribution and joint probability distribution.
				2. Understand the concept of correlation, regression and curve fitting.
				3. Demonstrate testing of hypothesis of sampling distribution.
				4. Apply the knowledge of complex differentiation and complex integration in

				diverse fields related to field theory and signal processing.
11		4	Additional Mathematics - 2 (18MATDIP41)	1. Solve rank of matrix by elementary row operations - Echelon form. Consistency of system of linear equations - Gauss elimination method
				2. Demonstrate various physical models through 2 nd and higher order linear differential equation and solve such equations.
				3. Construct a variety of Partial differential equation and solution by direct integration, method of separation of variables.
				4. Apply the knowledge of numerical methods, infinite series and series solution of ordinary differential equation to explain various physical and engineering problems.
12		4	Analog Circuits (18EC42)	1. Understand the biasing of BJTs, FETs and functioning of linear ICs
				2. Interpret the basics of semiconductor devices
				3. Analyze the applications of semiconductor devices
				4. Design applications using semiconductor devices
13		4	Control Systems (18EC43)	1. Develop the mathematical model of mechanical and electrical systems and find a transfer function from block diagram and signal flow graph method
				2. Understand time domain specifications for first and second-order system
				3. Determine the stability of a system in the time the domain using Route Harvitz criteria and root locus technique

				4. Determine the stability of a system in the frequency the domain using Nyquist and bode plots
				5. Model a control system in continuous and discrete-time using state variable techniques
14		4	Engineering Statistics & Linear Algebra (18EC44)	1. Apply the concept of Random Variables and Random Processes in Communication System.
				2. Model the Random events in typical communication events to extract quantitative statistical parameters.
				3. Analyze typical signal sets in terms of basis function of amplitude, phase and frequency.
				4. Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and Eigen values.
15		4	Signals & Systems (18EC45)	1. Understand mathematical description and representation of continuous and discrete time signals and systems and classify them.
				2. Apply the properties of impulse response to determine output and characteristics of Linear Time Invariant Systems (LTI) systems. (Convolution Sum, Convolution Integral and classification)
				3. Analyze the LTI Systems in time and transform domains. (ZT, FS, FT and DTFT)
				4. Write MATLAB program to apply transform on a speech signal and analyse the frequency domain signal for the spectral (frequency) components.
16		4	Microcontroller (18EC46)	1. Apply the basic knowledge of processor architecture in Embedded System design

				2. Design 8051 microcontroller based programs using assembly / high-level language
				3. Design programs based on timers and interrupts
				4. Design interfacing circuits to 8051 Microcontroller
				5. Design microcontroller based system
17		4	Constitution of India, Professional Ethics and Cyber Law (18CPC49)	1. Have constitutional knowledge and legal literacy.
				2. Understand Engineering and Professional ethics and responsibilities of Engineers.
				3. Understand the cybercrimes and cyber laws for cyber safety measures.
18		4	Microcontroller Laboratory (18ECL47)	1. Develop ALP for solving simple applications that manipulates data
				2. Interface various I/O devices to Microcontroller
				3. Demonstrate Serial communication using High level language program
				4. Design a Microcontroller based system
19		4	Analog Circuits Laboratory (18ECL48)	1. Design analog circuits using BJT/FETs and evaluate their performance characteristics
				2. Design analog circuits using OPAMPs for different applications
				3. Simulate and analyze analog circuits for different electronic applications.
20		5	Technological Innovation Management And Entrepreneurship (18ES51)	1. understand the fundamental concepts of Management and Entrepreneurship
				2. Understand the role of organization structure, staffing, motivation in management

				3. Describe Functions of managers, Entrepreneurs and their social Responsibilities.
				4. Compare various ideas for creativity and Innovation in Family business.
				5. Analyse various business models for Marketing and Financial opportunities.
21		5	Digital Signal Processing (18EC52)	1. Determine the frequency response of different signals using DFT
				2. Apply the properties of DFT in signal analysis and filtering of long data sequences.
				3. Analyse the computation of DFT using filtering techniques.
				4. Develop FIR and IIR filters using different techniques.
				5. Understand the DSP processor architecture.
22		5	Principles of Communication Systems (18EC53)	1. Compare the performance of different types of amplitude modulation schemes
				2. Analyse angle modulation schemes and its effects in time and frequency domain
				3. Analyse the effect of noise in analog modulation systems
				4. Apply the concepts of sampling process and waveform coding techniques on different types of signalling
23		5	Information Theory & Coding (18EC54)	1. Apply the basic concept of information theory to characterize Dependent & Independent Sources
				2. Apply Source Encoding Algorithms to encode the data
				3. Model the continuous and discrete communication channels using input, output and joint probabilities

				4. Design the error control encoding and decoding circuits
				5. Design a communication system incorporating advanced coding algorithms
24		5	Electromagnetic Waves (18EC55)	1. Understand the basic concepts of electric field
				2. Explain the magnetic field, time varying fields and uniform plane wave.
				3. Apply the concepts of electric field in solving numerical problems.
				4. Solve numerical problems on Magnetic fields, time varying fields and plane waves.
25		5	Verilog HDL (18EC56)	1. Identify the suitable Abstraction level for a particular digital design.
				2. Interpret the various constructs in logic synthesis.
				3. Design and verify the functionality of digital circuits/systems in different abstraction levels using test benches.
				4. Design digital circuits effectively using Verilog tasks, functions and directives.
26		5	Digital Signal Processing Laboratory (18ECL57)	1. Simulate discrete/digital signals using MATLAB.
				2. Develop a SCILAB program to simulate signal processing operations.
				3. Design of IIR and FIR - low pass and high pass filters.
				4. Implement DSP algorithms on DSP processor TMS320C6713 floating point Processor using C language.
27		5	HDL Laboratory (18ECL58)	1. Design, simulate and analyze HDL programs for Combinational circuits in Dataflow, Behavioral and Gate level Abstractions.

				2. Design, simulate and analyze HDL programs for Sequential circuits in Behavioral level of abstraction.
				3. Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.
				4. Interface the hardware to the programmable chips and analyze their functionality
28		6	Digital Communication (18EC61)	1. Explain the basic concepts of digital communication system.
				2. Apply the knowledge of signal representation and transmission over AWGN channels.
				3. Analyze the performance of a digital communication system in light of transmission over AWGN channels and band-limited channels
				4. Design the transmitter and receiver for signaling over AWGN channels and band-limited channels.
				5. Design communication and signaling subsystem using open source tools
29		6	Embedded Systems (18EC62)	1. Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system
				2. Apply the basic knowledge of processor architecture in Embedded System design
				3. Use the knowledge of RTOS in Embedded system design
				4. Develop ARM Cortex M3 based programs using assembly / high-level language
				5. Design simple embedded application prototype

30		6	Microwave & Antennas (18EC63)	1. Explain the working of microwaves sources, devices and antennas.
				2. Apply the network theory to find out parameters of microwaves and transmission lines and microwaves passive devices.
				3. Apply the electromagnetic theory to calculate antenna parameters.
				4. Illustrate the concepts of microwave transmission lines and antennas using numerical examples.
31		6	Data Structures using C++ (18EC643)	1. Explain fundamentals of data structures and their applications essential for programming/problem solving
				2. Analyze Linear Data Structures: Stack, Queues, Lists
				3. Analyze Non Linear Data Structures: Trees
				4. Assess appropriate data structure during program development/Problem Solving
32		6	Digital System Design using Verilog (18EC644)	1. Construct the combinational circuits using discrete gates and programmable logic
				2. Describe Verilog model for Sequential circuits and test pattern generation
				3. Design a Semiconductor Memory for Specific chip design
				4. Design Embedded systems using Microcontrollers and synthesize different types of Processor and I/O controllers that are used in Embedded Systems
33		6	Python Application Programming (18EC646)	1. Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
				2. Demonstrate proficiency in handling Strings and File Systems.

				3. Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
				4. Interpret the concepts of Object-Oriented Programming as used in Python.
				5. Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
34		6	Embedded Systems Laboratory (18ECL66)	1. Develop assembly language programs using ARM Cortex M3 for different applications
				2. Interface external devices and I/O with ARM Cortex M3
				3. Develop C language programs and library functions for embedded system applications
				4. Design simple embedded application prototype
35		6	Communication Laboratory (18ECL67)	1. Determine the characteristics and response of microwave devices
				2. Demonstrate the characteristics of micro strip antennas and devices and compute the parameters associated with it.
				3. Design and test the Analog/digital modulation circuits/systems
				4. Measure guided wavelength, VSWR and attenuation in microwave test bench
36		6	Mini-project (18ECMP68)	1. Consolidate the literatures referred to identify and formulate the engineering problem
				2. Arrive at a list of available engineering tools that may be used for solving the identified engineering problem
				3. Design the hardware / software related to work undertaken

				4. Analyse and interpret results of experiments conducted on the designed solution(s) to arrive at result based conclusion
				5. Demonstrate professional skill-sets
37		7	Computer Networks (18EC71)	1. Explain the basic concepts of data communications, networking and topology of wired / wireless networks.
				2. Apply the knowledge of data link layer, and network layer communication protocol design.
				3. Understand the transport layer and application layer protocols in communication network
				4. Design and simulate the networking concepts and protocols using C/C++/opensource programming.
38		7	VLSI Design (18EC72)	1. Apply the knowledge of MOS transistor theory to understand its characteristics, CMOS fabrication process and technology scaling
				2. Design the given logic function using stick diagrams and layout with the knowledge of physical design aspects (capacitance estimation and delay models).
				3. Design of combinational, sequential and dynamic circuits using MOS devices.
				4. Design the memory elements and understand the concept of testing and testability issues in VLSI design
39		7	Digital Image Processing (18EC733)	1. Define the general terminology of digital image processing.
				2. Explain various types of image enhancement techniques in spatial domain and frequency domain.

				3. Describe the methodologies for image restoration, Morphology and colour image processing.
				4. Design the image processing techniques using modern tool
40		7	IOT & Wireless Sensor Networks (18EC741)	1. Explain the basic concepts of IoT and WSN
				2. Understand the application of basic principles of Internet and cloud services in IoT domain
				3. Design software for IoT/WSN based applications
				4. Apply the basic networking principles in analyzing Wireless sensor networks
41		7	Cryptography (18EC744)	1. Explain basic cryptographic algorithms to encrypt and decrypt the data.
				2. Design symmetric and asymmetric cryptography algorithms to encrypt and decrypt the information.
				3. Apply concepts of modern algebra in cryptography algorithms.
				4. Apply pseudo random sequence in stream cipher algorithms.
42		7	Machine Learning with Python (18EC745)	1. Identify the problems in machine learning
				2. Select supervised, unsupervised and reinforcement learning for problem solving.
				3. Apply theory of probability and statistics in machine learning and perform statistical analysis of machine learning techniques.
				4. Apply concept learning, ANN, Bayes classifier nearest neighbour.
43		7	Digital Systems Design using VHDL (18EC754)	1. Construct the combinational circuits using discrete gates and programmable logic
				2. Describe VHDL model for combinational and Sequential circuits

				3. Design Semiconductor memory, Programmable logic devices and Programmable Array Logic
				4. Describe Synthesis, Hardware testing and Test ability
44		7	Computer Networks Lab (18ECL76)	1. Understand the services offered by different layers using connecting devices and analyze the performance parameters.
				2. Model and Analyze packet /file transmission between nodes for wired/wireless local area network (LAN) (TCP/UDP) using NCTUNs.
				3. Simulate the networking concepts and protocols using C/C++ programming
				4. Analyze and Compare the performance of routing algorithms.
45		7	VLSI Laboratory (18ECL77)	1. Design the schematic and Layout of CMOS based Inverter & given logic functions (NAND)
				2. Design the schematic and Layout of CMOS Amplifier circuits.
				3. Analyze the CMOS circuits using various simulations and Layout techniques.
				4. Develop Verilog Codes to realize the Digital Circuits.
46		7	Project Work Phase - 1 (18ECP78)	1. Consolidate the literatures referred to identify and formulate the engineering problem
				2. Identify the community that shall benefit through the solution to the identified engineering problem and also demonstrate concern for environment
				3. Arrive at a list of available engineering tools that may be used for solving the identified engineering problem

				4. Engage in effective oral and written communication by recording every stages of project work
				5. Able to perform in a team, contribute to the team and mentor/lead the team
47		8	Network Security (18EC821)	1. Explain network security services and mechanisms and security concepts.
				2. Understand the concept of Transport Level Security and Secure Socket Layer.
				3. Explain Security concerns in Internet Protocol security
				4. Explain Intruders, Intrusion detection, and Malicious Software
				5. Describe Firewalls, Firewall Characteristics, Biasing, and Configuration
48		8	Optical Communication Networks (18EC824)	1. Apply basic knowledge of fiber optics to model optical communication system
				2. Analyze losses in optical communication
				3. Design optical transceiver system
				4. Illustrate the networking aspects of optical fiber and describe various standards associated with it
49		8	Internship (18ECI85)	1. Acquire fundamental knowledge about a specific technical domain
				2. Design the hardware/software related to the work undertaken
				3. Analyze the results of the work carried out
				4. Demonstrate the professional skill-sets
50		8	Project Work Phase 2 (18ECP83)	1. Understand fundamental knowledge about a specific technical domain
				2. Design the hardware / software related to work undertaken
				3. Analyse and interpret results of experiments conducted on the designed

				solution(s) to arrive at result based conclusion
				4. Demonstrate the professional skill-sets
				5. Work in a team and perform as a leader with ethical concern
51		8	Technical Seminar (18ECS84)	1. Acquire fundamental knowledge about a specific technical domain
				2. Identify promising problems and new directions of various cutting edge technologies
				3. Develop individual and team work by having interaction with peers
				4. Demonstrate the presentation, professional and communication skills

2021 Scheme

Sl.No	Branch	Sem	Subject	CO,S
1	ECE	3	Transform Calculus, Fourier Series and Numerical Techniques (21MAT31)	1. To solve ordinary differential equations using Laplace transform
				2. Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
				3. To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
				4. To solve mathematical models represented by initial or boundary value problems involving partial differential equations
				5. Determine the extremals of functional using calculus of variations and solve

				problems arising in dynamics of rigid bodies and vibrational analysis.
2		3	Digital System Design using Verilog (21EC32)	1. Simplify Boolean functions using K-map and Quine-McCluskey minimization technique.
				2. Analyze and design for combinational logic circuits.
				3. Analyze the concepts of Flip Flops (SR, D, T and JK) and to design the synchronous sequential circuits using Flip Flops.
				4. Model Combinational circuits (adders, subtractors, multiplexers) and sequential circuits using Verilog descriptions.
3		3	Basic Signal Processing (21EC33)	1. Understand the basics of linear algebra (vector space and Eigenvalues)
				2. Understand mathematical description and representation of discrete-time signals and systems and classify them.
				3. Apply the properties of the impulse response to determine the output and characteristics of Linear Time Invariant Systems (LTI) systems. (Convolution Sum and classification)
				4. Analyse the discrete LTI Systems in Z-transform.
				5. Write a MATLAB/Sci-lab/Python program to analyse the basics of linear algebra and properties of discrete time signals with its transforms.
4		3	Analog Electronics Circuits (21EC34)	1. Understand the biasing of BJTs, FETs and functioning of linear ICs
				2. Analyse the principle of operation and characteristics of SCR and UJT
				3. Interpret the basics of semiconductor devices

				4. Analyze the applications of semiconductor devices
5		3	Constitution of India and Professional Ethics (21CIP37)	1. Have constitutional knowledge and legal literacy.
				2. Understand Engineering and Professional ethics and responsibilities of Engineers
				3. Understand the cybercrimes and cyber laws for cyber safety measures.
6		3	LIC Lab using Pspice / MultiSIM (21EC383)	1. Design and analyze the basic applications of op-amp.
				2. Design and analyze the various linear applications of op-amp.
				3. Design and analyze the various non- linear applications of op-amp.
				4. Analyze the performance of oscillators and multi vibrators and filters using pspice.
7		3	Analog & Digital Electronics Lab (21ECL35)	1. Design and analyze the BJT/FET amplifier and oscillator circuits
				2. Design and test Opamp circuits to realize the mathematical computations, DAC and precision rectifiers
				3. Design and test the combinational logic circuits for the given specifications
				4. Test the sequential logic circuits for the given functionality.
				5. Demonstrate the basic electronic circuit experiments using SCR and 555 timer
8		3	Social Connect and Responsibility (21SCR36)	1. Enable the student to do a deep drive into societal challenges being addressed by NGO(s), social enterprises & The government and build solutions to alleviate these complex social problems through immersion, design & technology.

				2. Provide a formal platform for students to communicate and connect with their surroundings.
				3. Enable to create of a responsible connection with society
9		4	Maths for Communication Engineers (21MAT41)	1. Use the concept of Analytic function and complex potential to solve the problems in electromagnetic theory and complex integration in airfoil and image processing.
				2. Obtain series solution ODEs
				3. Fit an appropriate mathematical model for the statistical data by using correlation and regression analysis.
				4. Apply discrete and continuous probability distribution in engg. field
				5. Construct joint probability distribution and testing the hypothesis
10		4	Digital Signal Processing (21EC42)	1. Determine response of LTI systems using time domain and DFT techniques
				2. Compute DFT of real and complex discrete time signals
				3. Compute DFT using FFT algorithms
				4. Design FIR and IIR Digital Filters
				5. Design of Digital Filters using DSP processor
11		4	Circuits & Controls (21EC43)	1. Analyse and solve Electric circuit, by applying, loop analysis, Nodal analysis and by applying network Theorems.
				2. Evaluate two port parameters of a network and Apply Laplace transforms to solve electric networks.
				3. Deduce transfer function of a given electrical system, from differential equation representation or Block Diagram representation and SFG representation.

				4. Calculate time response specifications and analyse the stability of the system.
				5. Draw and analyse the effect of gain on system behaviour using root loci.
				6. Perform frequency response Analysis and find the stability of the system.
				7. Represent State model of the system and find the time response of the system.
12		4	Communication Theory (21EC44)	1. Compare the performance of different types of amplitude modulation schemes
				2. Analyze angle modulation schemes and its effects in time and frequency domain.
				3. Analyze the effect of noise in analog modulation systems
				4. Apply the concepts of sampling process and waveform coding techniques on differenttypes of signals.
13		4	Universal Human Values (21UH49)	1. To help the students appreciate the essential complementarity between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings.
				2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
				3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behaviour and mutually enriching interaction with Nature.

14		4	Octave / Scilab for signals (21EC483)	1.Demonstrate the DSP concepts on signal generation and sampling using Scilab/Octave
				2. Design and verify the computation of discrete signals using Scilab/Octave.
				3. Demonstrate and verify the application of FFT/DFT algorithm for a given signal using Scilab/Octave.
				4. Design and demonstrate programs to evaluate different types of low and high pass FIR filters using Scilab/Octave.
				5. Design, demonstrate and visualize different real world signals using Scilab/Octave programs.
15		4	Communication Laboratory I (21ECL46)	1. Demonstrate the AM and FM modulation and demodulation by representing the signals in time and frequency domain.
				2. Design and test the sampling, Multiplexing and PAM with relevant circuits.
				3. Demonstrate the basic circuitry and operations used in AM and FM receivers.
				4. Illustrate the operation of PCM and delta modulations for different input conditions.