CO's DATA 2018 SCHEME

Slno	Subject code	Title	Course Outcomes
1	18MAT31	Transform Calculus, Fourier Series And Numerical Techniques	CO1: Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering. CO2: Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory. CO3: Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems. CO4: Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods. CO5: Determine the externals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
2	18EC32	Network Theory	CO1: Apply differential equation knowledge of mathematics to mesh/node analysis source transformation/source shifting of linear networks and to find the solution of passive linear networks CO2: Select and apply network theorems to obtain desired parameters of passive linear networks and also test linear passive two port networks. CO3: Correlate mathematical knowledge of initial value and final value theorem to analyze the behaviour of circuit elements under different transient conditions. CO4: Design as an individual to use the modern engineeirng simulation tool multisim/python programming to (i) verify network theorems (ii) Analyze the supernode and super mesh networks (iii) obtain RLC of a resonant circuit
3	18EC33	Electronic Devices	C203.1: Describe the principles of semiconductor Physics C203.2: Describe the principles and characteristics of different types of semiconductor devices C203.3: Utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems. C203.4:Describe the fabrication process of semiconductor devices

4	18EC34	Digital System Design	CO1: Apply the fundamental concepts, terminology of logic design and different Boolean postulates and various simplification methods (K-map, Quin-MuClusky, MEV) to solve the given problem. CO2: Apply the knowledge of basic combinational components to design the other combinational circuits. CO3: Analyse the concepts of sequential circuits and design the different types of sequential circuits like registers, ripple counters. CO4: Design the various sequential circuits like synchronous counters, Mealy and Moore circuits. CO5: Design the various applications of digital circuits like code converters, ROM, PLAs, and FPGA.
5	18EC35	Computer Organization & Architecture	C205.1: Illustrate the functional units of Desktop, Notebook, Work station, Server and Super computers and analyze the basic performance equation of a processor. C205.2: To use instruction set and addressing modes in instruction execution and compare the same with Complex instruction set computer and Reduced instruction set computer. C205.3:Demonstrate the hardware and software features of a processor to communicate with its environment. C205.4:Summarize trade off between size, speed and cost with Random access memory, Read only memory and virtual memory of a processor. C205.5: Illustrate organization of single,multiple bus and microprogrammed processor.
6	18EC36	Power Electronics & Instrumentation	CO1: Build and test circuits using power electronic devices. CO2: Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS. CO3: Define instrument errors. CO4: Develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency. CO5: Describe the principle of operation of Digital instruments and PLCs and Use Instrumentation amplifier for measuring physical parameters.

7	18ECL37	Electronic Devices & Instrumentation Laboratory	C01: Understand the characteristics of various electronic devices and measurement of parameters. C02: Design and test simple electronic circuits C03: Use of circuit simulation software for the implementation and characterization of electronic circuits and devices.
8	18ECL38	Digital System DesignLaboratory	CO1: Apply Boolean laws to simply the digital circuits and design simple logic circuits. CO2: Design, test and evaluate various combinational circuits such as adder, subtractor, comparator, multiplexer and demultiplexer. CO3Construct the various flipflops and test for its functionality. CO4: Design and test the various sequential circuits such as shift register, pseudo sequence generators and counters. CO5: Simulate various sequential circuits.
9	18MAT41	Complex Analysis, Probability and Statistical Methods	CO1: Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory. CO2:Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing. CO3:Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field. CO4: Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data. CO5: Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
10	18EC42	Analog Circuits	CO1: To design the basic BJT,MOSFET biasing circuits and analyze the small signal models. CO2: To understand the Mosfet amplifier configuration and analyze the frequency response of CS amplifier. CO3: To classify different feedback configurations and output stages. CO4: To analyze and apply Opamp with negative feedback. CO5: To analyze opamp circuits like ADC,active filters,applications of 555 timer.

11	18EC43	Control Systems	CO1: Derive a mathematical model of a given system(physical, mechanical or electrical) represented through block diagram and signal flow graph CO2: Determine the behaviour of time response and steady state errors of I and II order systems for standard test input signals CO3:Analyze the stability of a system using numerical (Rouths-Harwitz criteria)and graphical (root locus)app roach CO4: Evaluate and Correlate the stability of a system using time and frequency responses CO5:Model a control system in continuous and discrete time using state variable technique
12	18EC44	Engineering Statistics & Linear Algebra	CO1: Identify and associate single random variables with continuous and discrete distribution. CO2: Analyse bivariate or multivariate distribution and correlation between the random variables. CO3: Analyse the concepts of random process, power spectral densities with linear systems. CO4: Compute quantitative parameters for matrices, linear transformations and orthogonality of vectors and subspaces. CO5: Apply the techniques of determinants, use eigenvalues and eigenvectors to analyse the single valued decomposition.
13	18EC45	Signals & Systems	CO1: **Apply the Knowledge gained in the course to study the behaviour of a system by anlyzing the discrete components such as RC, LC Circuits, eualizers, amplifiers, filters and steady state response etc to anlyze the discrete components of a system.** **CO2: Analyze the given problem and then formulate appropriate solution for signal analysis and processing application using various time domian representations CO3: Exhibit the ability to use the latest tool such as Matlab or Python to simulate simple signal analysis and various CTF Properties CO4: Demonstrate the ability to design and test the systems with the help of Fourier Transforms** **CO5: Enhance the intra-Personal and inter-personal communication skills by working in group activietie to solve a given problem related to signals and systems, Z-Transforms**

14	18EC46	Microcontroller	Co1: Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller and Interfacing of 8051 to external memory and Instruction set of 8051. CO2: Write 8051 Assembly level programs using 8051 instruction set. CO3: Explain the Interrupt system, operation of Timers/Counters and Serial port of 8051. CO4: Write 8051 Assembly language program to generate timings and waveforms using 8051 timers, and I/O ports to send & receive serial data using 8051 serial port and to generate an external interrupt using a switch. CO5: Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports.
15	18ECL47	Microcontroller Laboratory	CO1: Enhance programming skills using assembly language and C. CO2: Write assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051. CO3: Interface different input and output devices to 8051 and control them using assembly language programs. CO4: Interface the serial devices to 8051 and do the serial transfer using C programming. CO5: Develop applications based on Microcontroller 8051.
16	18ECL48	Analog Circuits Laboratory	CO1: **Design** amplifier and Oscillator circuits using BJT/FETs and evaluate their performance characteristics. CO2: **Design** analog circuits using OPAMPs for different applications CO3: **Design and demonstrate** the 555 timer operations in Astable and Monostable configurations CO4: **Simulate and analyze** analog circuits that uses FETs/BJT and ICs for different electronic applications.
17	**18ES51**	Technological Innovation Management & Entrepreneurship	CO1:Recall and identify the relevance of management concepts & its principles. CO2:Describe, discuss and relate management functions adopted within an organization. CO3: Realize the social responsibilities towards business and entrepreneurship CO4:Understand the components in developing a business plan CO5:Awareness about various sources of funding and institutions

			supporting entrepreneurs
18	**18EC52**	Digital Signal Processing	CO1 Explain the frequency domain sampling and reconstruct discrete time signal CO2 Compute DFT of a discrete time sequence using Linear Transformation Techniques CO3 Evaluate Linear Convolution of Long input sequence and Impulse response using Overlap save and add methods CO4 Construct and design of digital IIR in Direct form I, Direct form II, digital FIR in linear , Lattice Structures using windowing technique CO5 Understand the DSP processor architecture
19	18EC53	Principles of Communication Systems(PCS)	C303.1: Analyse and compute performance of AM and FM modulation in the presence of noise at the receiver. C303.2Analyze and compute performance of digital formatting processes with quantization noise. C303.3 Multiplex digitally formatted signals at Transmitter and demultiplex the signals and reconstruct digitally formatted signals at the receiver.(m4,m5) C303.4 Design/Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission.

20	18EC54	Information Theory and Coding	CO1: Examine mathematically the performance parameters of the digital communication system (information system) to solve simple engineering problems related to it. CO2: Analyze statistical modeling of independent and dependent information sources (Ex: Markov Source) for the given specifications. CO3: Apply the basic rules and properties of coding for fundamental Source coding to encode the source output by constructing r-ary codes with the help of suitable optimum source coding algorithm (Shannon's encoding algorithm, Shannon-Fano and Huffman encoding algorithm) for the given specifications. CO4: Analyze the design aspects of communication channels (Continuous and Discrete Channel Modeling) in terms of channel capacity and entropy functions. CO5: Design Channel encoder and decoder using different error control coding schemes (Block codes and Convolutional Codes) and realize the importance of Error control coding in Communication systems.
21	18EC55	Electromagnetic Waves	CO1: Solve problems on Electric force, electric field intensity due to point, linear, volume charges by applying Coulombs Law and Guass Law. CO2: Determine Energy and Potential for various charge distributions and apply continuity equation of current to calculate flow of current, total charge, charge density etc for Conductors. CO3: Apply Poissons and Laplace equations for solving boundary value problems associated with electrostatics and magneto-statics. CO4: Analyze the applications of magneto-statics by applying Biot-Savart law, Ampere's circuital law and derive the concepts of magnetic forces and materials to characterize the magnetic circuits. CO5: Analyze Maxwell's equations for Static fields, time varying fields, EM waves in free space, conductors and Evaluate power associated with EM waves using Poynting theorem.

22	18EC56	Verilog HDL	CO1:Depict the importance of HDL's and Current Trends in HDL's, VLSI IC circuit design flow. CO2:Utilize Verilog constructsas per the IEEE 1364-2001 Verilog standard to designand verify (testbench)the digital circuits for the given specifications. CO3: Differentiate between top down and bottom –up digital design flow, Modules and Module Instances in Verilog. CO4:Analyse the functionality of Verilog code for the specified digital logic circuit as per the given specifications. CO5: Identify the significance of tasks, functions, additional features such as procedural continuous assignment statements, override parameters, and issues involved in logic synthesis.
23	18ECL57	Digital Signal Processing Lab	CO1: Demonstrate sampling theorem and evaluate Impulse response of a given system CO2: Compute Linear and Circular convolution of two given sequences CO3:Evaluate Auto correlation and cross correlation of given sequences and verify their properties CO4: Draw Magnitude and frequency spectrum by computing N point DFT of a sequence CO5: Design FIR and IIR Filters. Implement FIR and IIR Filters to meet the given specifications
24	18ECL58	HDL Laboratory	CO1:Apply the Verilog HDL/VHDL constructs to model a list of combinational and sequential digital circuits in dataflow, behavioral or gate styles and simulate the same using Xilinx/Modelsim/Altera or any EDA tool. CO2:Write Synthesizable Verilog/VHDL codes to describe digital circuits and program FPGA/CPLD to experience the semi-custom VLSI design flow. CO3:Demonstrate the use of FPGA/CPLD to interface external peripherals such as stepper motor, LCD, DC Motors and validate the designs usingappropriate apparatus(likeoscilloscope) for the given specifications. CO4:Demonstrate the use of Verilog HDL/VHDL constructs to generate waveforms such as sine, triangular, square for the given specifications, and validate the same by interfacing DAC to FPGA/CPLD, and displaying on an oscilloscope.