1ˢᵗ Semester
18ELN14

Describe the operation of diodes ,FET and operational amplifiers
Describe operating principle of SCRs and its application
Explain the working and design of Fixed Voltage IC regulators
Describe the principle of Communication system using Mobile of phones.
Ilustrate the Boolean laws and analyze the combinational circuits

2ⁿᵈ Semester
18ELN24

Describe the operation of diodes ,FET and operational amplifiers
Describe operating principle of SCRs and its application
Explain the working and design of Fixed Voltage IC regulators
Describe the principle of Communication system using Mobile of phones.
Ilustrate the Boolean laws and analyze the combinational circuits

3ʳᵈ Semester
18EC31

Use laplace transform in solving Differential equations arising in network analysis, control systems and other fields of engineering.
Use inverse laplace transform in solving Differential/ integral equations arising in network analysis, control systems and other fields of engineering.
Analyze expansion of Fourier series using Euler formula
Apply Fourier expansion in practical harmonic problems
Apply to transform form one to another domain by Fourier integrals

18EC32

Reduce the circuit complexity and apply Kirchhoff's laws to solve the network.
Solve network problems by using principle of theorems
Calculate current and voltages of a network to understand switching analysis of networks by solving integro- diffrential equations
Apply Laplace transform to solve network problems
Evaluate RLC elements in Resonant circuits.
Apply two port network parameters to solve given network.

18EC33

Understand the principles of semiconductor Physics
Understand the working principles of semiconductor devices.
Understand the principles and characteristics of semiconductor diodes.
Understand the applications of semiconductor diodes.
Utilize the mathematical models of bipolar junction transistors for circuits and systems

18EC34

Understand the SOP & POS expressions & their simplifications from truth table.
Solving max terms of SOP & POS using simplification techniques like k-map, Quine -McClusky minimization & Reduced Prime Implicant tables.
Analyze & Design of Boolean Expressions using Decoders & Multiplexers & Design of Adders & Subs tractors using K-map
Understand the logics of Flip flops & Latches using Logic diagrams & verifying with truth table & Design of counters using clocked D,T or SR flip flops.
Understand the Mealy & Moore models using their Block diagrams & Design of Sequential circuits using State & state transition technique.
Analyze and design sequential circuits using programmable logic devices & design applications of digital circuits

18EC35

Describe the basic structure of Computer, Performance measurement with CPU clock.
Understand the impact of instruction set architecture on cost-performance of computer design and analyze with various addressing methodologies.
Determine the impact of interrupt on input output devices in the process of interaction between various components.
Understand different kind of input output interfaces available for computer system by demonstrations in lab with disassembling of computer.
Determine with the cost-performance issues and design trade-off in designing and constructing a computer processor including memory.
Describes the virtual memory management and secondary storage devices.

18EC36

Build and test circuits using power electronic devices.

Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS.

Define instrument errors and develop circuits for multirange Ammeters, Voltmeters and Bridge to measure passi values and frequency.

Describe the principle of operation of Digital instruments and PLCs.

Use Instrumentation amplifier for measuring physical parameters.

18ECL37

Understand and design wave shaping circuits

Apply mathematics and concepts of fundamentals to design electronics circuits

Conduct an experiment to verify the device characteristics

Design a simple electronic circuit for a given specifications

To estimate the parameters through experiments and analyse the performance of the given circuits

18ECL38

Verify &understand De-Morgan's theorem &realize the boolean expression using logic gates

Analyze the full adder/subtractor logic using logic gates

Design the parallel adder &subtractor circuits and compare both the circuits

Evaluate the performance of 4-bit magnitude comparator using 7485 IC

Realize 4:1 mux &8:1 mux and Analyze the both

Realize 1:8 Demux &3:8 Decoder using 74138 IC

4th Semester

18EC41

Apply the knowledge of complex analysis its properties and construction of analytical functions.

Analyze various transformations to convert one plane to another evaluate complex integral and finding the bet relation between the variables.

Learn different probability measures ,distribution function and its properties and also apply various inequalities in statistical analysis.

Solve the problem of statistical inference problems,of testing of hypothesis.

18EC42

Understand the BJT re -model and biasing circuits with the help ofBJT modeling

Compute AC gain and Impedance for BJT using h parameters model

Understand the construction and characteristics of JFET's and MOSFET's

Determine the performance characteristics of FET amplifier using small signal model

Understand the low and high frequency responses of BJT and FET amplifiers.

Understand the characteristics of negative feedback amplifiers associated with transfer and stability gain

18EC43

Apply mathematical modeling to determine the transfer function of a system.
Apply block diagram reduction technique and signal flow graph reduction methods to determine the transfer function of a system
Analyze the behavior of the system in time domain for 1st and 2nd order systems and PID controllers
Analyze the stability of the system using various time domain and bode plot technique
Analyze the stability of the system using frequency domain techniques and Analyze the electrical system using state variable technique.

18EC44

Identify and associate the random variables and random processes in communication events
Analyze and model the random events in typical communication events to extract quantitative statistical parameters
Analyze and model typical signal sets in terms of a basis function set of amplitude, phase and frequency
Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and eigen values

18EC45

Understand the basic elementary signals and their classification by mathematical description.
Develop input output relationship for LTI system and understand the convolution operation for continuous time and Discrete signals.
Resolve the signals in frequency domain using Fourier transform of continuous time signal
Apply Fourier transform representation to study and resolve the signal and system
Apply z-transform and its properties for the analysis of discrete time system using partial fraction expansion method.

18EC46

Understand the features and internal architecture of 8051 using block diagram, Analyze the interfacing of RAM and ROM memories with 8051 using connection diagram
Understand the syntax, rules of and execution procedure of assembly language.
Understand data transfer, arithmetical , logical, loop, jump and call instructions
Develop programs for timer/counter -0/1 using assembly and C language
Develop program for interrupt handling for timer interrupt, external interrupt and serial communication interrupt using assembly and C language

18ECL47

Enhance programming skills using assembly language and C

Write assembly language programs in 8051 for solving simple problems that manipulate input data using differe of 8051

Interface different input and output devices to 8051 and control them using assembly language programs

Interface serial devices to 8051 and do the serial transfer using C programming

Develop applications based on Microcontroller 8051

5th Semester

18EC51

Understand the functional areas of management for an organization.

Apply the knowledge of selection process to select a staff.

Show proper communication in the organization.

Select the control techniques to direct the staff and for an organization.

Understand the role and importance of an entrepreneur for the economic development.

Evaluate the project objective and identification for project report.

18EC52

Understand signal reconstruction from the samples at Nyquist rate

Understand DFT behavior with input of Variable condition

Understand DFT behavior with input of Variable condition

Compare DFT with FFT on efficient Computation

Develop DIT-FFT algorithm to find DFT for a given input length

Implement IIR structures using DF-1 &2from IIR filter co-efficients

18EC53

Understanding the need of HDLs and CAD tools in digital system design.

Acquiring the knowledge on hierarchical design methodologies to solve digital system design problems

Analyzing the structure of verilog program.

Understand Verilog Tasks and Directives.

Design digital circuits using gate level modeling with test bench

18EC54

Understand entropy by measure of information content of the message

Apply entropy and oder of information sources to analyze Markov model

Understand uniqueness of code using Kraft Inequality and prefix code

Understand the conversion of information into binary sequence using Shanon, Shanon Fano and Huffman encoding algorithms

Model continuous and discrete communication channels using input, out and joint probability matrix

Determine channel capacity of binary symmetric and binary erasure channels using mutual information and Muroga's theorem

18EC55

Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventi methods and charge in a volume.

Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem.

Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations.

Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage ind in electric circuits.

Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and Evaluate power associated with EM waves using Poynting theorem

18EC56

Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction.

Design and verify the functionality of digital circuit/system using test benches.

Identify the suitable Abstraction level for a particular digital design.

Write the programs more effectively using Verilog tasks, functions and directives.
Perform timing and delay Simulation.
Interpret the various constructs in logic synthesis.

18EC57

Create and verify functionality of various gates at the different level of abstractions.

Design, verify and implement the functionality of various Combinational logic circuits.

Design and Analyze the functionality of 32 bit ALU.

Design, verify and implement the functionality of Flipflops.

Design, verify and implement the functionality of counters.

Design the digital system for Interfacing FPGA to alpha numeric LCD display.

Design the digital system for Interfacing FPGA with Hex Keypad.

Design the digital system for Controlling the speed and direction of stepper motor using HDL

Design the digital system for Interfacing FPGA with temperature sensor

Study of DAC and generation of different signals using HDL .

18ECL58

Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level A[

Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation wavefor

Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.

Interface the hardware to the programmable chips and obtain the required output

6th Semester
18EC61

Understand & acquire the knowledge on representation of band pass signals.

Solve problems to new situations by applying line coding methodologies.

Learn about signal transmission over AWGN channels

Perform coherent & Non coherent modulation techniques to analyze the channel performance.

Identify the difference between coherent & non coherent orthogonal modulation techniques.

18EC62

Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3.

Apply the knowledge gained for Programming ARM Cortex M3 for different applications.

Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.

Develop the hardware /software co-design and firmware design approaches.

Explain the need of real time operating system for embedded system applications.

18EC63

Comprehend the working of Klystron oscillator

Examine the transmission lines using graphical methods

Implement the Z, Y and S parameters to Multiport networks

Understand the working of microwave passive devices

Have knowledge of micro, parallel and shielded striplines

Compute the antenna design characteristics using the parameters

18EC644

Understand the Concepts of Verilog Language to model and design digital systems and Embedded System

Design digital systems in a real and larger systems design context

Understand and design Semiconductor memories frequently used in application specific digital systems

Analyze the performance of IC's that are embedded in package and assembled in PCBs for different application.

Analyze and design of Processors and I/O controllers used in embedded systems.

18EC654

Describe the electromechanical switching systems and its comparison with the digital switching

Determine the telecommunication traffic and its measurements

Define the technologies associated with the data switching operations

Describe the software aspects of switching systems and its maintenance

18ECL67

Display "Hello World" message using Internal UART.

Interface and Control a DC Motor.

Interface a Stepper motor and rotate it in clockwise and anti-clockwise direction.

Interface a DAC and generate Triangular and Square waveforms.

Interface a 4x4 keyboard and display the key code on an LCD.

Using the Internal PWM module of ARM controller generate

PWM and vary its duty cycle.

Demonstrate the use of an external interrupt to toggle an LED On/Off.

Display the Hex digits 0 to F on a 7-segment LED interface, with an
appropriate delay in between.

Interface a simple Switch and display its status through Relay, Buzzer and LED.

Measure Ambient temperature using a sensor and SPI ADC IC

18ECL68

Determine the characteristics and response of microwave devices and optical waveguide.

Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it.

Simulate the digital modulation schemes with the display of waveforms and computation of performance parame

Design and test the digital modulation circuits/systems and display the waveforms.

Determine the bending loss, propogation loss,numerical aperture of an optical fiber.

7th Semester

18EC71

Understand the concepts of networking thoroughly

Identify the protocols and services of different layers.

Distinguish the basic network configurations and standards associated with each network.

Analyze a simple network and measurement of Transport layer parameters.

Analyze a simple network and measurement of Application layer parameters.

18EC72

Analyze the concepts of MOS transistor theory to understand the characteristics of MOSFETs.

Apply the concepts of MOSFETs to construct logic gates and develop stick diagrams, layout.

Analyze the delay characteristics of CMOS circuits using basic circuit concepts

Analyze CMOS subsystem and its architectural issues with the design constraints.

Apply basic concepts of digital design to examine FPGA architecture and testability issues in VLSI.

18EC733

Understand the fundamentals , applications, visual perception and image acquisition in image processing system time examples

Understand and analyze the tools for Image enhancement techniques in spatial and frequency domain

Understand and analyze the noise models for image restoration , filtering and estimating the degradation.

Understand the color image processing fundamentals using color models

Understand segmentation of images for identification of lines ,edges and boundaries of image.

18EC741

Understand choice and application of IoT & M2M communication protocols.

Describe Cloud computing and design principles of IoT.

Awareness of MQTT clients, MQTT server and its programming

Develop an architecture and its communication protocols of of WSNs.

Design of Communication protocols and routing protocol in WSNs

18EC745

Identify the problems in Machine learning

Select supervised , Unsupervised or reinforcement learning for problem solving

Apply theory of probability and statistics in machine learning

Apply Concept learning ANN , Bayesclassifiers, k nearest neighbor

Perform statistical analysis of machine learning techniques.

18ECL76

Use the network simulator for learning and practice of networking algorithms.

Illustrate the operations of network protocols and algorithms using C programming.

Simulate the network with different configurations to measure the performance parameters.

Implement the data link and routing protocols using C programming.

18ECL77

Design and simulate combinational and sequential digital circuits using Verilog HDL
Understand the Synthesis process of digital circuits using EDA tool
Perform ASIC design flow and understand the process of synthesis, synthesis constraints and evaluating the synthesis reports to obtain optimum gate level net list
Design and simulate basic CMOS circuits like inverter, common source amplifier and differential

8th Semester

17EC81

Understand the system architecture and the functional standard specified in LTE 4G.
Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and and voice from users.
Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for data call scenarios.
Test and Evaluate the Performance of resource management and packet data processing and transport algorithms

17EC82

Classification and working of optical fiber with different modes of signal propagation
Describe the transmission characteristics and losses in optical fiber communication
Describe the construction and working principle of optical connectors, multiplexers and amplifiers
Describe the constructional features and the characteristics of optical sources and detectors.
Illustrate the networking aspects of optical fiber and describe various standards associated with it

18EC834

Introduce some Concepts and techniques that are core to Machine learning
Understand learning and decision tress
Acquire Knowledge of neural networks, Bayesian techniques and instant based learning
Understand analytical learning and reinforced learning