

List of Experiments (Semester I, II and III) to be Demonstrated in Offline Mode for M. Sc. Electronics Students (Batch 2019) Currently in Semester - IV

Digital Electronics and C-Programming Lab

1. Design of full adder using basic gates.
2. Design 2-bit comparator using basic universal gates
3. Design 4x1 multiplexer circuit Using universal gates
4. A minimum of Fifteen C programs demonstrating the use of control structures, loops, arrays, functions and pointers compiling on various Compilers.
5. Demonstrating the process of compilation, linking, debugging and other concepts in programming.

Antenna and Wave Propagation

1. To study the radiation pattern of dipole antenna
2. To calculate the directivity and gain of dipole antenna

Microwave Engineering

1. To determine the frequency and wavelength of a microwave in a rectangular waveguide operated in TE₁₀ mode.
2. To determine the standing-wave –ratio and reflection coefficient

Power Electronic Circuits and Systems

1. Verifying Switching action of a power BJT
2. Verifying Switching action of a power MOSFET
3. IV characteristics of an SCR with calculation of holding and latching currents

Linear Integrated Circuits and Applications

1. Op-amp as an inverting and non-inverting amplifier
2. To study Op-amp as an integrator
3. To study RC- Phase shift Oscillator

Circuit Analysis & Synthesis

1. Verification of Source transformation
2. Calculations of two port parameters
3. Pole & Zero response of 1st order system

Microprocessor architecture and programming

1. Basics of working with Emu 8086 (demonstration and practice involving examples of data transfer, arithmetic and logic operations).
2. Basic Hands-on training with 8086 Kit (demonstration and practice involving examples of data transfer, arithmetic and logic operations).
3. Interfacing using 8086 Kit (stepper motor / traffic light controller)

List of Experiments for CMOS VLSI and Nanoelectronics-I (MOSFET Theory)

1. Transfer Characteristics of
 - a. Enhancement NMOS
 - b. Enhancement PMOS
 - c. Depletion NMOS
 - d. Depletion PMOS
2. Output Characteristics of
 - a. Enhancement NMOS
 - b. Enhancement PMOS
 - c. Depletion NMOS
 - d. Depletion PMOS
3. Calculating Threshold Voltage of MOSFET from transfer characteristics
4. Channel length modulation effect in N and P MOSFET
5. Calculating Short channel parameters
6. Calculating Sub-Threshold Swing of MOSFET from transfer characteristics

Communication Engineering.-I

1. Design and realize AM modulator using Square Law Modulator and calculate its modulation index and power
2. Design and realize AM detector using square law detector and envelope detector.
3. Design and realize DSB-SC signal modulator using Analog Multiplier.

Signals and Systems

1. Plot of basic signals (Sinusoidal, Square, Triangular, Saw tooth, Rect-linear, Impulse, unit step, Ramp)
2. Plot for Linear and Circular Convolution

Digital Signal Processing

1. Design of Butterworth and Chebyshev type- 1 filter (Magnitude and phase plot)
2. Computation of DFT of a sequence
3. Basic idea of DSP boards

Microcontroller Architecture and Programming

1. Run an assembly language program to Display “Superb” on seven segment displays of the microcontroller development board
2. Run an assembly language program to read a hex byte from the keyboard of the kit and split it into two nibbles and stores MSB in 2050H and LSB in 2051H
3. Run an assembly language program on microcontroller development board to add two numbers and store result at 3012 address.

Control System Engineering

1. Calculate the RC time constant using RC circuit.
2. Design and analyze first order circuits

3. Design and analyze 2nd order circuits
4. Design and analyse lag compensator

CMOS VLSI & Nano Electronics-II

1. Design & study of CMOS Inverter
2. Design & study of CMOS based Logic gates
3. Design & Study of Sequential circuits
4. Design & study of CMOS PLA, PAL

Communication Engineering – II

1. Generation and Detection of Amplitude Shift Keying Using Matlab
2. Generation and Detection of Frequency Shift Keying Using Matlab

CMOS VLSI & nano Electronics-III

1. Design & study of CMOS common source amplifier
2. Design & study of CMOS common drain amplifier
3. Design & Study of Current Mirror circuits
4. Design & study of MOS based Amplifier circuit
5. Design & study of CMOS comparator

Digital Image Processing

1. Image Reading and Writing using MATLAB
2. Noise Filtering in images using MATLAB
3. Edge detection of images using MATLAB
4. Image compression using MATLAB

CMOS VLSI & Nano Electronics IV

1. Modelling and simulation of Diode.
2. Modelling and simulation Transistor and MOSFET
3. Modelling and simulation of nano devices.

Note: The list is the minimum set of experiments to be demonstrated/ conducted in offline-mode at the Department by the teacher as notified. The corresponding teacher may demonstrate more experiments depending upon the availability of time and requirements of the Course.