ELECTRONICS AND COMMUNICATION ENGINEERING	
Course Code	**17ELN15/25 - BASIC ELECTRONICS**
CO1	Appreciate the significance of electronics in different applications
CO2	Understand the applications of diode in rectifiers filter circuits and wave shaping
CO3	Apply the concept of diode in rectifiers, filters circuits
CO4	Design simple circuits like amplifiers (inverting and non inverting), comparators, adders, integrator and differentiator using OPAMPS
CO5	Compile the different building blocks in digital electronics using logic gates and implement simple logic function using basic universal gates
CO6	Understand the functioning of a communication system, and different modulation technologies
CO7	Understand the basic principles of different types of Transducers
Course Code	**17EC32 - ELECTRONIC INSTRUMENTATION**
CO1	Describe instrument measurement errors and calculate them.
CO2	Describe the operation of Ammeters, Voltmeters, Multimeters and develop circuits for multirange Ammeters and Voltmeters.
CO3	Describe functional concepts and operation of Digital voltmeters and instruments to measure voltage, frequency, time period, phase difference of signals, rotation speed, capacitance and pH of solutions.
CO4	Describe functional concepts and operation of various Analog measuring instruments to measure field Strength, impedance, stroboscopic speed, in/out of phase, Q of coils, insulation resistance.
CO5	Describe and discuss functioning and types of Oscilloscopes, Signal generators and Transducers.
CO6	Utilize AC and DC bridges for passive component and frequency measurements
Course Code	**17EC33 - ANALOG ELECTRONICS**
CO1	Describe the working principle and characteristics of BJT, FET, Single stage, cascaded and feedback amplifiers.
CO2	Describe the Phase shift, Wien bridge, tuned and crystal oscillators using BJT/FET/UJT.
CO3	Calculate the AC gain and impedance for BJT using re and h parameters models for CE and CC configuration.
CO4	Determine the performance characteristics and parameters of BJT and FET amplifier using small signal model.
CO5	Determine the parameters which affect the low frequency and high frequency responses of BJT and FET amplifiers and draw the characteristics.
CO6	Evaluate the efficiency of Class A and Class B power amplifiers and voltage regulators.

Course Code	17EC34 - DIGITAL ELECTRONICS
CO1	Develop simplified switching equation using Karnaugh Maps and Quine-McClusky techniques.
CO2	Explain the operation of decoders, encoders, multiplexers, demultiplexers, adders, subtractors and comparators.
CO3	Explain the working of Latches and Flip Flops (SR,D,T and JK).
CO4	Design Synchronous/Asynchronous Counters and Shift registers using Flip Flops.
CO5	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits.
CO6	Apply the knowledge gained in the design of Counters and Registers.
Course Code	**17EC35 - NETWORK ANALYSIS**
CO1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star-delta transformation/ source transformation/ source shifting.
CO2	Solve network problems by applying Superposition/ Reciprocity/ Thevenin‘s/ Norton‘s/ Maximum Power Transfer/ Millman‘s Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions.
CO3	Calculate current and voltages for the given circuit under transient conditions.
CO4	Apply Laplace transform to solve the given network.
CO5	Evaluate for RLC elements/ frequency response related parameters like resonant frequency, quality factor, half power frequencies, voltage across inductor and capacitor, current through the RLC elements, in resonant circuits
CO6	Solve the given network using specified two port network parameter like Z or Y or T or h.
Course Code	**17EC36 - ENGINEERING ELECTROMAGNETICS**
CO1	Evaluate problems on electric field due to point, linear, volume charges by applying conventional methods or by Gauss law.
CO2	Determine potential and energy with respect to point charge and capacitance using Laplace equation.
CO3	Calculate magnetic field, force, and potential energy with respect to magnetic materials.
CO4	Apply Maxwell‘s equation for time varying fields, EM waves in free space and conductors.
CO5	Evaluate power associated with EM waves using Poynting theorem
Course Code	**17ECL37 - ANALOG ELECTRONICS LABORATORY**
CO1	Test circuits of rectifiers, clipping circuits, clamping circuits and voltage regulators.
CO2	Determine the characteristics of BJT and FET amplifiers and plot its frequency response.
CO3	Compute the performance parameters of amplifiers and voltage regulators
CO4	Design and test the basic BJT/FET amplifiers, BJT Power amplifier and oscillators

Course Code	17ECL38 - DIGITAL ELECTRONICS LABORATORY
CO1	Demonstrate the truth table of various expressions and combinational circuits using logic gates.
CO2	Design and test various combinational circuits such as adders, subtractors, comparators, multiplexers.
CO3	Realize Boolean expression using decoders.
CO4	Construct and test flips-flops, counters and shift registers.
CO5	Simulate full adder and up/down counters.
Course Code	**17EC42 - SIGNALS AND SYSTEMS**
CO1	Classify the signals as continuous/discrete, periodic/aperiodic, even/odd, energy/power and deterministic/random signals.
CO2	Determine the linearity, causality, time-invariance and stability properties of continuous and discrete time systems.
CO3	Compute the response of a Continuous and Discrete LTI system using convolution integral and convolution sum.signal, odd vs. even, conjugate symmetric vs anti- symmetric
CO4	Determine the spectral characteristics of continuous and discrete time signal using Fourier analysis.
CO5	Compute Z-transforms, inverse Z- transforms and transfer functions of complex LTI systems
Course Code	**17EC43- CONTROL SYSTEMS**
CO1	Develop the mathematical model of mechanical and electrical systems
CO2	Obtain the transfer function of electrical and mechanical systems by block diagram reduction rule and mason gain formula
CO3	Understand time domain specifications for first and second order systems
CO4	Determine the stability of a system in the time domain using Route Harvitz criteria and root locus technique
CO5	Determine the stability of a system in the frequency domain using Nyquist and bode plots
CO6	Model a control system in continuous and discrete time using state variable techniques
Course Code	**17EC44 - PRINCIPLES OF COMMUNICATION SYSTEMS**
CO1	Analyse communication systems in both the time and frequency domains
CO2	Have familiarity with amplitude modulated and angle modulated communication systems and be able to analyse their performance in the presence of noise.
CO3	Understand source coding, information theory and Shannon's theorem.
CO4	Have familiarity with various digital modulation systems and their properties, including bandwidth, channel capacity, transmission over bandlimited channels, inter-symbol interference (ISI), demodulation methods, and error performance in the presence of noise.
CO5	Have knowledge of error correcting codes, including block codes

Course Code	17EC45 - LINEAR INTEGRATED CIRCUITS
CO1	Operational amplifiers and characteristics as well as various types of op-amps.
CO2	Functioning of PLL, VCO, V-I, I-V converters.
CO3	Active Filters, ADC, DAC
CO4	555 Timer
CO5	Op-amps and Various applications
CO6	Instrumentation Amplifiers, Isolation Amplifiers, Wave Generators and Oscillators.
CO7	Interpretation of Performance Characteristics of Practical Op-amps.
CO8	Apply the knowledge gained in the design of practical circuits for amplifiers, filters oscillators, multi vibrators, voltage regulators and electronic systems
Course Code	**17EC46- MICROPROCESSORS**
CO1	The History of evaluation of Microprocessors, Architecture of 8086, 8088, 8087, CISC & RISC, Von-Neumann & Harvard CPU architecture
CO2	8086 Assembly level programs using the 8086 instruction set
CO3	Modular programs using procedures and macros
CO4	8086 Stack and Interrupts programming
CO5	Interface 8086 to Static memory chips and 8255, 8254, 0808 ADC, 0800 DAC, Keyboard, Display and Stepper motors.
CO6	Use INT 21 DOS interrupt function calls to handle Keyboard and Display
Course Code	**17ECL47 - MICROPROCESSOR LABORATORY**
CO1	Proficiently use DOS assemblers like MASM
CO2	Use the knowledge of the 8086 instruction set and utilizes it in programming.
CO3	Perform Logical, Arithmatic and Rotate/shift operations on data
CO4	Understand and implement delay generation using 8086 instructions
CO5	Understand different interfacing concepts and use of PPI
CO6	Implement programming module of keyboard, stepper motor, waveform generator (DAC), Seven segment display to work with 8086.
Course Code	**17ECL48 - LINEAR ICS AND COMMUNICATION LAB**
CO1	To discuss the op-amp's basic construction, characteristics, parameter limitations, various configurations and countless applications of op-amp
CO2	Analyze and deign basic op-amp circuits, particularly various linear and non-linear circuits, active filters, signal generators, and data converters