

Department of Electronics and Communications **Engineering**

BACHELOR OF TECHNOLOGY (B.Tech.)

(4 Year Undergraduate Degree Program)

IN

ELECTRONICS AND COMMUNICATION ENGINEERING

[w. e. f. 2023-2024]

Program Learning Outcomes (PLOs)

PL01: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, Science, and mathematics

PL02: an ability to acquire and apply new knowledge as needed, Using appropriate learning strategies

PL03: An ability to acquire leadership qualities and learn the Art of working together as a team by the various activities.

PL04: An ability to get motivated by involving themselves in Research and development activities in the various labs such as Device modeling , embedded systems and sensor networks

PL05:An ability to be ready with industry standard by exposing Them to the latest technologies such as microelectronics, Embedded systems and sensor networks

PL06: An ability to get involved in community based and inter professional projects which induce them to serve the society.

ELECTROMAGNETIC FIELD THEORY	
Course Code: 20EC0201	
Credits:3	
L T P : 3 1 0	Course Category: Core

Prerequisite: NIL	
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COURSE LEARNING OUTCOMES

CL01: Relate the fundamentals of vector, coordinate system to electromagnetic concepts

CL02: Analyze the characteristics of Electrostatic field

CL03: Interpret the concepts of Electric field in material space and solve the boundary conditions

CL04: Explain the concepts and characteristics of Magneto Static field in material space and solve boundary conditions.

CL05: Determine the significance of time varying fields

FUNDAMENTALS OF ELECTRONICS DEVICES	
Course Code: 20EC0203	
Credits:3	
L T P : 3 0 0	Course Category: Core
Prerequisite: NIL	

COURSE LEARNING OUTCOMES

CL01: Explain the structure and working operation of basic electronic devices.

CL02: Design and analyze amplifiers.

CL03: Analyze frequency response of BJT and MOSFET amplifiers

CL04: Design and analyze feedback amplifiers and oscillator principles.

CL05: Design and analyze power amplifiers and supply circuits

DIGITAL SYSTEMS	
Course Code: 20EC0205	
Credits:3	
L T P : 3 0 0	Course Category: Core
Prerequisite: NIL	

COURSE LEARNING OUTCOMES

CL01: Use Boolean algebra and simplification procedures relevant to digital logic.

CL02: Design various combinational digital circuits using logic gates.

CL03: Analyse and design synchronous sequential circuits.

CL04: Analyse and design asynchronous sequential circuits. .

CL05: Build logic gates and use programmable devices

SIGNALS AND SYSTEMS	
Course Code: 19EC0207	
Credits:3	
L T P : 3 0 0	Course Category: Core
Prerequisite: 19MA0102	

COURSE LEARNING OUTCOMES

CL01: Determine if a given system is linear/causal/stable

CL02: Determine the frequency components present in a deterministic signal

CL03: Characterize continuous LTI systems in the time domain and frequency domain

CL04: Characterize continuous LTI systems in the time domain and frequency domain

CL05: Compute the output of an LTI system in the time and frequency domains

ELECTRONICS DEVICES LAB	
Course Code: 19EC0221	
Credits:2	
L T P : 0 0 2	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Characteristics of PN Junction Diode and Zener diode.

CL02: Design and Testing of BJT and MOSFET amplifiers.

DIGITAL SYSTEM LAB	
Course Code: 19EC 0223	

Credits:2	
L T P : 0 0 2	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Implement simplified combinational circuits using basic logic gates

CL02: Implement combinational circuits using MSI devices

CL03: Implement sequential circuits like registers and counters

ELECTRONIC CIRCUITS	
Course Code: 20EC0204	
Credits:3	
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Acquire knowledge of Working principles, characteristics and applications of BJT and FET.

CL02: Acquire knowledge of Frequency response characteristics of BJT and FET amplifiers

CL03: Analyze the performance of small signal BJT and FET amplifiers - single stage and multi stage amplifiers

CL04: Apply the knowledge gained in the design of Electronic circuits

ANALOG INTEGRATED CIRCUITS	
Course Code: 20EC0206	
Credits:3	
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01 : Design linear and nonlinear applications of OP - AMPS

CL02 : Design applications using analog multiplier and PLL

CL03 : Design ADC and DAC using OP - AMPS

CL04 : Generate waveforms using OP - AMP Circuits

CL05 : Analyze special function ICs

TRANSMISSION LINES AND WAVEGUIDES	
Course Code: 19EC0208	
Credits:3	
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Analyze the various types of transmission lines and to discuss the losses associated.

CL02: Understand impedance transformation and matching.

CL03: Use smith chart in problem solving

CL04: Apply knowledge on filter theories and waveguide theories are imparted.

COMMUNICATION THEORY	
Course Code: 19EC0210	
Credits:3	
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Gain knowledge in amplitude modulation techniques

CL02: Gain knowledge in frequency modulation techniques

CL03: Understand the concepts of Noise to the design of communication systems CL04: Gain knowledge in Information theory

ELECTRONIC CIRCUITS LAB	
Course Code: 19EC0222	
Credits:2	
L T P : 0 0 2	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Design and Testing of BJT and MOSFET amplifiers.

CL02: Acquire knowledge of Frequency response characteristics of BJT and FET amplifiers

CL03: Analyze the performance of small signal BJT and FET amplifiers - single stage and multi stage amplifiers

CL04: Apply the knowledge gained in the design of Electronic circuits

COMMUNICATION LAB	
Course Code: 19EC0224	
Credits:2	
L T P : 0 0 2	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Design AM, FM & Digital Modulators for specific applications.

CL02: Compute the sampling frequency for digital modulation.

CL03: Simulate & validate the various functional modules of Communication system.

CL04: Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes.

CL05: Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of Communication system

CONTROL SYSTEMS	
Course Code: 20EC0303	
Credits:3	
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Compute the transfer function of different physical systems.

CL02: Analyse the time domain specification and calculate the steady state error.

CL03: Illustrate the frequency response characteristics of open loop and closed loop system response.

CL04: Analyse the stability using Routh and root locus techniques.

CL05: Illustrate the state space model of a physical system and discuss the concepts of sampled data control system.

DIGITAL COMMUNICATION	
Course Code: 20EC0304	
Credits:3	
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Gain knowledge in digital modulation techniques

CL02: Gain knowledge in sampling and quantization

CL03: Understand the concept of Spread Spectrum techniques in Communication system

ANTENNA AND WAVE PROPAGATION	
Course Code: 19EC0305	
Credits:3	

L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Explain the various types of antennas and wave propagation.

CL02: Design and analyze wire and aperture antennas.

CL03: Design and analyze antenna arrays.

CL04: Analyze the antenna arrays, aperture antennas and special antennas such as frequency independent and broad band

HARDWARE PROGRAMMING	
Course Code: 20EC0307	Continuous Evaluation: 40 Marks
Credits:3	End Semester Examination: 60 Marks
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Design and implement programs on 8086 microprocessor.

CL02: Design I/O circuits.

CL03: Design Memory Interfacing circuits.

CL04: Design and implement 8051 microcontroller based systems.

MICROPROCESSOR LAB	
Course Code: 19EC0321	
Credits: 2	
L T P : 0 0 3	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Ability to develop assembly language program for microprocessors and microcontrollers.

CL02: Ability to comprehend the architectural and pipelining concepts for Microprocessors.

CLO3: Ability to interface peripherals, sensors and actuators and in embedded systems.

CL04: Ability to design microprocessor / microcontroller based system.

CL05: Ability to design , develop and trouble shoot microcontroller based system.

DIGITAL COMMUNICATION LAB	
Course Code: 19EC0323	
Credits: 2	
L T P : 0 0 3	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Ability to experimentally analyze the performance of various kinds of signaling used in communication systems and their bandwidth requirement.

CL02: They gets hands on experience on system construction and performance evaluation CL03: Ability to study issues from communication links and channels, and their equalization techniques

RF AND MICROWAVE ENGINEERING	
Course Code: 19EC0302	
Credits: 3	
L T P : 3 0 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Explain the active & passive microwave devices & components used in Microwave communication systems.

CL02: Analyze the multi- port RF networks and RF transistor amplifiers.

CL03: Generate Microwave signals and design microwave amplifiers.

CL04: Measure and analyze Microwave signal and parameters.

OPTICAL FIBER COMMUNICATION	
Course Code: 19EC0304	
Credits: 3	
L T P : 3 0 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Realize basic elements in optical fibers, different modes and configurations. CL02: Analyze the transmission characteristics associated with dispersion and polarization techniques.

CL03: Design optical sources and detectors with their use in optical communication system.

CL04: Construct fiber optic receiver systems, measurements and coupling techniques.

CL05: Design optical communication systems and its networks.

VLSI TECHNOLOGY AND DESIGN	
Course Code: 19EC0306	
Credits: 3	
L T P : 3 1 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Realize the concepts of digital building blocks using MOS transistor.

CL02: Design combinational MOS circuits and power strategies.

CL03: Design and construct Sequential Circuits and Timing systems.

CL04: Design arithmetic building blocks and memory subsystems.

CL05: Apply and implement FPGA design flow and testing.

MICROWAVE AND OPTICAL COMMUNICATION LAB	
Course Code: 19EC0322	
Credits: 2	
L T P : 0 0 2	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Analyze the performance of simple optical link.

CL02: Test microwave and optical components.

CL03: Analyse the mode characteristics of fiber

CL04: Analyse the radiation of pattern of antenna

VLSI DESIGN LAB	
Course Code: 19EC0324	
Credits: 2	
L T P : 0 0 2	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Write HDL code for basic as well as advanced digital integrated circuit

CL02: Synthesize Place and Route the digital IPs

CL03: Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools

Course Code: 19EC0401	
Credits: 3	
L T P : 3 0 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Explain the Network Models, layers and functions.

CL02: Categorize and classify the routing protocols.

CL03: List the functions of the transport and application layer.

CL04: Evaluate and choose the network security mechanisms.

CL05: Discuss the hardware security attacks and countermeasures

WIRELESS COMMUNICATION	
Course Code: 20EC0403	
Credits: 3	
L T P : 3 0 0	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Characterize a wireless channel and evolve the system design specifications

CL02: Design a cellular system based on resource availability and traffic demands CL03:

Identify suitable signaling and multipath mitigation techniques for the wireless channel and system under consideration.

CL04: Understand the Digital modulation techniques for Wireless Communication

CL05: Design the Wireless Channel for WLAN and Bluetooth.

NETWORK SIMULATION LAB	
Course Code: 19EC0421	

Credits: 2	
L T P : 0 0 2	Course Category: Core
Prerequisite: Nil	

COURSE LEARNING OUTCOMES

CL01: Physical implementation of Networks using simulation tools CL02:

Implement the various protocols.

CL03: Analyse the performance of the protocols in different layers.

CL04: Analyze various routing algorithms