FACULTY OF ENGINEERING AND TECHNOLOGY
First Year Bachelor of Technology
In Effect from Academic Year 2020-21

Subject Code:1ET1000114	**Subject Title: ELEMENTS OF ELECTRONICS AND COMUNICATION ENGINEERING**
Pre-requisite Subject:	**Knowledge of semiconductor physics, Electric and Magnetic fields, Various communication equipment.**

Course Objective:
To introduce the operating and working principles of various electronic and communication systems at block diagram level and make the students aware about different areas of EC Engineering.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
				Theory		Practical		Total
Lecture (L)	Tutorial (T)	Practical (P)	Credit	University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
4	-	2	5	70	30	-	20	120

Subject Contents			
Sr. No	**Topic**	**Total Hours**	**Weight (%)**
1	**Semiconductor Devices:** Semiconductors, Diode: p-n junction under bias, Bipolar Junction Transistor: structure and symbols, Field Effect Transistors: classification, symbols, Integrated Circuits	4	5
2	**Circuit concepts:** Electrical Quantities: electric charge, electric field, electric potential (voltage), current, magnetic field, energy & power, Source and loads: types of voltage & current sources, Lumped Circuit Elements: circuit, resistor, inductor, capacitor, maximum power transfer, Meters and Measurements: voltmeter, ammeter, oscilloscope, Node-Voltage & Mesh-Current Analysis: examples, Computer aided circuit analysis using SPICE & MATLAB.	8	15
3	**Analog Building Blocks:** Continuous time signal, continuous state(analog) signal & their examples, analog system examples, The amplifier block: basic amplifier circuit model, voltage gain, current gain, power gain, Ideal operational Amplifier: symbol & characteristics, Practical properties of Op-amp: typical values for I.C 741, Applications of Op-amp: Basic circuit diagrams	8	15
4	**Digital Building Blocks:** Discrete time signal,discrete state(digital) signal & their examples, digital system examples, advantages of digital systems over analog systems, Digital Building blocks: number systems & conversions, BCD system, logic blocks, digital logic gates, boolean postulates, Digital system components: combinational & sequential circuit examples (block diagram level only), Display devices: LED, LCD, segment display, CRT, Block diagram of computer organization, Types of computer networks & Network topologies.	12	25
5	**Signal Processing:**	8	20

	Signal and spectral analysis: block diagram of signal processing system, different signal processing tasks, digital communication system, line spectrum, signal bandwidth, Modulation, Sampling and Multiplexing: signal modulation & its requirements, frequency translation using product modulator, sampling and pulse modulation, multiplexing systems, Interference & noise: Interfering signals, thermal noise, white noise, SNR.		
6	**Communication Systems:** Electromagnetic spectrum, propagation modes, Waves, Transmission lines, Waveguides and Antenna fundamentals: types of transmission lines & waveguides, antenna types, Analog communication systems: AM,FM,PM with waveforms only, Mobile radio systems : Cellular telephone concept , Digital communication systems: PCM , Carrier Modulation by digital signals: ASK,FSK,PSK with waveforms only, Global Positioning System.	8	20

Course Outcome:
After studying the subject, student shall be able to recognize working principles of different electronic circuits used in day to day life. Student will also come to know the ideas behind working of modern communication systems.

List of Text Book:
1.Introduction to Electrical Engineering by Mulukutla S. Sarma, Oxford University Press.

List of Reference Books:
1.Electronics Principles by Malvino, 6th edition , TMG publication
2.Elecronics Communications by Dennis Roody & John Coolen, 4 th edition, Pearson publication

Titles of Experiments:
1. Introduction to Integrated Circuits
2. Universal gates
3. Half adder and full adder
4. Maximum Power transfer theorem
5. Op-amp as an inverting & non-inverting amplifier
6. Op-amp as a summing & averaging amplifier
7. Flip-flops
8. Frequency modulation.
9. Sampling theorem.
10. Pulse Code Modulation
11. Computer aided circuit analysis using SPICE
12. Computer aided circuit analysis using MATLAB