Code: 1BESC104C/204C   **Course: Introduction to Electronics and Communication Engineering**
Credits: 3   **L:T:P- 3:0:0**
CIE: 50%   **SEE: 50%**
SEE Hours: 3 Hrs   **Total Marks:100**

Prerequisites if any	None
Learning objectives	1. Explain the physical principles underlying the operation of semiconductor devices such as diodes and transistors. 2. Understand and apply Boolean algebra to simplify and analyze digital logic expressions. 3. Define the basic components of a communication system: transmitter, channel, receiver.

Course Outcomes:

On the successful completion of the course, the student will be able to

COs	Course Outcomes	Bloom's level
CO1	Understand the working principles, fundamental characteristics of various semiconductor devices including diodes and transistors.	L2
CO2	Analyse basic combinational circuits using the fundamental principles of digital systems.	L3
CO3	Describe the fundamental concepts of embedded and communication systems.	L2

Mapping with POs and PSOs:

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	2	2	-	1	-	-	-	-	-	1			
CO2	3	2	2	-	1	-	-	-	-	-	1	To be mapped by Respective Department		
CO3	3	2	2	-	1	-	-	-	-	-	1			

Mapping Strength: **Strong– 3**   **Medium – 2**   **Low – 1**

Course Structure

		No. of Lecture Hours	No. of Tutorial Hours	No. of Practical Hours
Module – 1: Semiconductor Devices				
1.1	Working principles of the following devices: PN Junction Diode	1	0	0
1.2	Zener Diode and Its Use in Voltage Regulation	1	0	0
1.3	Light Emitting Diode (LED)	1	0	0
1.4	Photodiode	1	0	0
1.5	Basic principles and characteristics of power devices: Silicon Controlled Rectifier (SCR), TRIAC	2	0	0
1.6	DIAC and IGBT	2	0	0
Module – 2: Rectifiers and BJT				
2.1	Power supply block diagram	1	0	0
2.2	Working principle with waveform of: Half Wave Rectifier with and without Capacitor Filter Circuit.	1	0	0
2.3	Working principle with waveform of: Full Wave Bridge Rectifier with and without Capacitor Filter Circuit.	2	0	0
2.4	Bipolar Junction Transistors – Basics of BJT	2	0	0
2.5	BJT as an amplifier	1	0	0
2.6	BJT as a switch.	1	0	0
Module – 3: Boolean Algebra and Logic Circuits				
3.1	Introduction to number systems and number conversion methods	1	0	0
3.2	1's and 2's Complement Operation	2	0	0
3.3	Properties of Boolean Algebra, Boolean Functions	1	0	0
3.4	Canonical and Standard Forms	1	0	0
3.5	Digital Logic Gates	1	0	0
3.6	Adders- Half adder, Full adder	2	0	0

	Module – 4: Embedded Systems			
4.1	Definition	1	0	0
4.2	Embedded systems vs general computing systems	1	0	0
4.3	Classification of Embedded Systems	1	0	0
4.4	Major application areas of Embedded Systems	1	0	0
4.5	Elements of an Embedded System	1	0	0
4.6	Core of the Embedded System	1	0	0
4.7	Differences between Microprocessor vs Microcontroller and RISC vs CISC	1	0	0
4.8	Definition of sensors and actuators with examples	1	0	0
	Module – 5: Introduction to communication systems			
5.1	Introduction, Communication systems block diagram	2	0	0
5.2	Communication System Scheme: Information Source and Input Transducer, Transmitter, Channel or Medium, Noise, Receiver	1	0	0
5.3	Definition of Modulation and Need for modulation	1	0	0
5.4	Concept of Radio Wave Propagation (Ground, Space, Sky)	2	0	0
5.5	Types of modulation: AM, FM, PM, ASK, FSK, PSK (Only Definition and waveforms)	2	0	0
	Total No. of Lecture Hours	**40**		
	Total No. of Tutorial Hours		**00**	
	Total No. of Practical Hours			**00**

Textbooks:

1. D.P Kothari and I J Nagrath, Basic electronics, Second Edition, McGraw Hill Education Pvt ltd, 2018.

Reference Books:

2. Ramakanth A Gayakwad, Op-amps and Linear Integrated Circuits, 4th Edition, Pearson Education, 2015.

3. John G. Proakis, Masoud Saleh, Fundamentals of Communication Systems, Second Edition, Pearson Educations, Inc., 2014.

4. Electronic Devices and Circuits, David A Bell, 5th Edition, Oxford, 2016

5. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN- 978-81-203-0417-8

Online Resources:

1. https://archive.nptel.ac.in/courses/108/105/108105158/
2. https://archive.nptel.ac.in/courses/108/106/108106105/