

BASIC ELECTRONICS (FOR ECE AND ALLIED BRANCHES)			
Course Code	22BEE13/23	Credits	3
Course Type	Non-Integrated	CIE Marks	50
Lecture Hours (L:T:P)	3:0:0	SEE Marks	50
Total Hours	40	SEE Hours	03
<p>Course Objectives: After studying this course, students will be able to understand the :</p> <ul style="list-style-type: none"> *Basics of diode and it's applications. *Working of BJT and FETs *Working of Op-amps and Oscillators. *Fundamentals of digital electronics. *Basics of Transducer and Communication systems. 			
Modules			Teaching Hours
Module-1			
<p>Semiconductor Diode: Introduction, PN Junction diode, Characteristics and Parameters, Diode Approximations, DC Load Line analysis. Diode Applications: Half Wave Rectifier, Full Wave Rectifier, Capacitor Filter Circuit. Zener Diode: Junction Breakdown, Characteristics and Parameters, Equivalent Circuit, Zener Diode as Voltage Regulator.</p>			8
Modules-2			
<p>Bipolar Junction Transistors: Introduction, BJT Voltages & Currents, BJT as an amplifier, Common Base Characteristics, Common Emitter Characteristics. BJT Biasing: DC Load line and Bias point, Biasing types (Fixed Bias, Collector to Base Bias, Voltage Divider Bias)Field Effect Transistor: Junction Field Effect Transistor, JFET Characteristics. MOSFETs: Enhancement & Depletion MOSFETs.</p>			8
Modules-3			
<p>Operational Amplifiers: Introduction, Block Diagram Representation of typical Op-Amp, Schematic Symbol, Op-Amp parameters. Op-amp applications: Voltage follower, Inverting, Non Inverting, Summer, Integrator and Differentiator. Oscillators: Barkhausen criterion, sinusoidal and non-sinusoidal oscillators, Ladder network oscillator, Wein bridge oscillator, Multivibrators, Single-stage Astable oscillator, Crystal controlled oscillators.</p>			8
Modules-4			
<p>Digital Electronics: Number system, Number base conversions. Signed Arithmetic: Binary addition & subtraction using 2's complement, Logics gates, Half Adder/Sub tractor, Full Adder/sub tractor, Boolean algebra, simplification of Boolean expressions, Realization of Boolean expressions using logic gates.</p>			8
Modules-5			
<p>Transducer: Strain Gauge, LVDT, Oscilloscope (CRO), CRO based measurements, Basics of Communication Systems: Electromagnetic spectrum, Block diagram of communication system, Need for Modulation, Modulation techniques: Amplitude modulation and frequency modulation (qualitative analysis), Super heterodyne receiver.</p>			8

Text Books:

1. Electronic devices and circuit theory by R L Boylestad, Louis N, 6TH edition, PH
2. Electronic Communication Systems, George Kennedy, 4th Edition, TMH

Reference Books:

1. Electronic Devices and Circuits, David A Bell, 5th Edition, Oxford, 2016
2. Op-amps and Linear Integrated Circuits, Ramakanth A Gayakwad, Pearson Education, 4th Edition
3. Digital Logic and Computer Design, M. Morris Mano, PHI Learning, 2008 ISBN-978-81-203-0417-8
4. Electronic Instrumentation and Measurements (3rd Edition) – David A. Bell, Oxford University Press, 2013
5. Electronics devices & circuits by David Bell, 5th Edition, Oxford University Press
6. Digital logic and computer design by M Moris Mano.

Question paper pattern:

- The question paper shall have five modules for 100 marks.
- Each full question carries 20 marks.
- Two questions to be set in each module (total ten questions).
- The candidate will have to answer one full question from each module.
- Note: There can be a maximum of 4 subsections in each Question.

Course Code	CO #	Course Outcome (CO)
22BEE13/23	CO1	Understand the basics of semiconductor, semiconductor devices and their applications.
	CO2	Analyze different biasing techniques of transistor and their applications as an amplifier and oscillator
	CO3	Analyze working of Op amp with its Applications & oscillators.
	CO4	To study number base conversion, understand laws of Boolean algebra, working of different logic gates & combinational circuits.
	CO5	Understand the working of different Electronic Systems & different modulation techniques and working of receiver circuit

