

## Basic Electronics and Circuit Fundamentals

Course Code: BEB308

Contact Hours: 60

Credit: 04 (L-3, T-1, P-0)

MM: 100

### Course Outline:

#### UNIT – I: Semiconductor diodes

Intrinsic and Extrinsic Semiconductor, p and n type semiconductors, Energy level diagrams, variation of resistivity with temperature, Fermi level, p-n junction diode, depletion layer, current flow mechanisms in forward and reverse biased diode, V-I characteristics, static and dynamic resistance, Zener diode and its applications.

#### UNIT – II : Rectifier

Introduction to Rectifier, Half-wave rectifier, full-wave rectifier (Centre-tapped and bridge). Calculation of ripple factor and rectification efficiency, Qualitative idea of C, L and  $\pi$ -filters.

#### UNIT – III : Bipolar Junction Transistors

n-p-n and p-n-p transistors, Physical mechanism of current flow, Active, Cut off and saturation regions characteristics of CB, CE and CC configurations, Current gains  $\alpha$ ,  $\beta$  and  $\gamma$  and relations between them. Load line analysis of transistors, DC load line and Q-point, transistor as 2-port Network, h-parameter equivalent circuit, Analysis of a single-stage CE amplifier using Hybrid Model. Transistor as an amplifier.

#### UNIT-IV: Network Theorems

Introduction to steady current and current density, Active and passive components, Kirchhoff's laws, Application of Kirchhoff's laws, Thevenin's theorem, Norton's Theorem, Superposition theorem and Maximum power transfer theorem.

#### UNIT- V: A C Bridges

Introduction to AC Bridges, Maxwell's bridge, Schering Bridge, Wein's Bridge, de-Sauty's Bridge.



Dean

Faculty of Education  
Invertis University  
Bareilly-243123, U.P



Head

Department of Education  
Faculty of Education & Mass Comm.  
Invertis University, Bareilly (UP)



Regional  
Invertis University  
Bareilly