

Generic Elective course for BCA
Course Name: Basic Electronics

(Credits: 06)

(Theory-04, Practicals-02)

Theory: 60 Lectures

Unit-I: Circuit Analysis

Concept of Voltage and Current Sources. Kirchhoff's Current Law, Kirchhoff's Voltage Law. Mesh Analysis. Node Analysis. Principle of Duality. Superposition Theorem. Thevenin's Theorem. Norton's Theorem. Reciprocity Theorem. Maximum Power Transfer Theorem. Introduction to Two Port Networks **(15 Lectures)**

Unit-II Semiconductor Devices-I

Junction Diode and its applications: PN junction diode (Ideal and practical)- I-V characteristics, dc load line analysis, Quiescent (Q) point. Zener diode, Rectifiers- Half wave rectifier, Full wave rectifiers (center tapped and bridge), circuit diagrams, working and waveforms, ripple factor and efficiency. Zener diode as voltage regulator, Introduction to Tunnel diode, metal contact diode **(15 Lectures)**

Unit-III Semiconductor Devices - II

Bipolar Junction Transistor: Review of the characteristics of transistor in CE and CB configurations, Regions of operation (active, cut off and saturation), Current gains α and β . Relations between α and β . dc load line and Q point. Unipolar Devices: JFET and MOSFET. Construction, working and I-V characteristics (output and transfer), Pinch-off voltage. **(15 Lectures)**

Unit-IV Number System and logic Gates

Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Representation of signed and unsigned numbers, BCD code. Binary, octal and hexadecimal arithmetic; addition, subtraction by 2's complement method, multiplication. Logic Gates and Boolean algebra: Truth Tables of OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Basic postulates and fundamental theorems of Boolean algebra. **(15 Lectures)**

Reference Books:

1. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
2. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
3. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.