ELECTRONICS DEVICES & CIRCUITS

1. Introduction

Credits: 4-0-0

2. **Course Outline**

UNIT – I: ElectronicDevices and Circuits
Voltage and current sources, Kirchhoff's voltage and current law, Superposition theorem, Thevnin's theorem, Norton's theorem, Maximim power transfer theorem.

UNIT – II: Diode
Semiconductors, p-n junction Diode, Working principle and characteristics of p-n junction diode, Zener diode, LED, Photo-diode, Half-Wave, Full-Wave and Bridge rectifiers, efficiency, ripple factor, voltage regulation. Clipping, clamping, voltage doublers and multipliers.

UNIT – III: Transistors
pnp and npn structures; CE,CB and CC configuration, input and output characteristics, α β and γ, cut off, active and saturation regions, biasing and bias stability, load line and Qpoint, Transistor as an amplifier (CE), Transistor as a switch, Types of FET, construction of junction FET, output characteristics, biasing, operating region, pinchoff voltage, MOSFET: enhancement and depletion type, construction, principle of operation and characteristics, elementary idea on CMOS, MOS inverter.

UNIT – IV : Amplifiers
Voltage and current amplifiers, principle of feedback, positive and negative feedback, advantages of negative feedback, multistage amplifier, RC coupled amplifier: frequency response, gain and band- width, class A, class B, Class AB and class C amplifiers, Introduction to Op-Amp.

UNIT – V: Digital Electronics
Decimal, binary and hexadecimal numbers, binary arithmetic, Boolean algebra, logic gates: OR, AND, NOT, NAND, NOR and exclusive¬OR, universal gate, de¬Morgan's theorems, 1's and 2's complement, Boolean simplifications, sum¬ of¬ product and product¬ of¬ sum form, Karnaugh map

3. Reading Material

Text Books

1. Integrated Electronics – J. Millman and C. Halkias (Mc Graw Hill).
2. Microelectronics – J.Millman ((Mc Graw Hill).
3. Electronics Fundamentals and Applications – J. D. Ryder (PHI Pvt. Ltd).
4. Electronic Device and Circuit Theory – R. Boylestad and L. Nashelsky (Prentice –Hall).
5. Operational Amplifier & Linear IC – Gayakwad (TMH)
6. Digital Principles & Applications – Malvino and Leach (TMH)
7. Digital Design by Moris Mano
8. Electronics Principles – A.P.Malvino (TMH).