Subject Code : P8AP4

CORE COURSE – IV - ANALOG AND DIGITAL ELECTRONICS

Unit-I IC Circuit fabrication

Classification-IC chip size and circuit complexity- monolithic IC Technology- Fabrication of typical circuit- Active and Passive components- Fabrication of FET's- Thick and Thin film technology.

Unit-II Operational Amplifier: Characteristics and applications

Basic information of operational amplifier- AC and Dc characteristics-Basic operational amplifier applications: -multiplier, divider, differentiator, integrator-instrumentation amplifier-AC amplifier-voltage and current and current to voltage converter-sample and hold circuit-log and antilog amplifiers-electronic analog computation-simultaneous and linear differential equation – comparator

Unit-III Active Filters, Oscillators and 555 Timer

Active filters-low pass, high pass, band pass, band reject filters-filter design – oscillators- principles and various types- Phase shift oscillator – wien's bridge oscillator– 555 timer; – monostable, astable and bistable multivibrator- phase lock loop –operating principles and monolithic phase-lock loops-PLL applications

UNIT - IV Boolean algebra, logic gates and K-Map

Basic theorems and properties of Boolean algebra- Boolean functions – Demorgan's theorem– Digital logic gates – Universality of NAND and NOR gates. Simplification of Boolean functions – The map method -three and four variable maps – SOP and POS simplifications

Unit-V Combinational & Sequential Circuits

Combinational logic design procedure: Adders - Sub tractors – Exclusive OR function – parity generation and checking- BCD adder – Decoders – Demultiplexers – Encoders – Multiplexers.

Flip Flop and Counters: Flip Flops – Triggering of Flip Flops - Flip Flops characteristics table - Flip Flops excitation tables- RS, JK, D and T flip flop – design of counters – Ripple counters and synchronous counter-Johnson counter.

Books for study

1. D.Roy Choudhury, Shail Jain, Linear Integrated Circuits, New Age International Pvt., Ltd., New Delhi, 1999 (Unit-I, II& III)

2. Malvino & Leach, Digital Principles and Applications, Tata McGraw Hill Publishing, New Delhi, 2000 (Unit IV & V)

Books for Reference

1. R.A.Gayakwad, Operational amplifier and Linear Integrated Circuits, PHIPvt., Ltd., New Delhi, 1999.
2. Moris Mano, Digital Computer Design, Prentice Hall of India, New Delhi, 2000.