

(EC528) MIXED SIGNAL IC DESIGN

Objective of the Course : *In most of the circuits includes digital and analog parts. This course gives the knowledge of both digital and analog section co-design and its performance validation.*

UNIT - I

Comparators: Using an OP-AMP for a comparator, charge-injection error, latched comparators.

UNIT - II

Switched Capacitor Circuits: Basic building blocks: OP-AMPs, Capacitors, Switches, nonoverlapping clocks, basic operations, and analysis, resistor equivalence of a switched capacitor, parasitic sensitive integrator, parasitic in sensitive switched capacitor, parasitic sensitive integrator, parasitic in sensitive integrators, signal flow graph analysis, first - order filters, switch integrators, signal flow graph analysis, first order filters, switch sharing fully differential filters, charged injections, switched capacitor, gain circuits, parallel resistor, capacitor circuit, pre settable gain circuit, other switched capacitor circuit, full wave rectifier, peak detector, sinusoidal oscillator.

UNIT - III

Phase Locked Loop: Simple PLL, Charge - Pump PLL, VCO : Ring Oscillator, LC Oscillator, Applications in PLL.

UNIT - IV

Digital to Analog Converter: Data Converters fundamentals, Nyquist rate D/A converters: Decoder based converter, Binary-scaled converters, thermometer code converter. Hybrid converter.

UNIT - V

Successive - Approximation converter, Dual - slope ADC, Sigma-delta ADC, Flash ADC, Folding ADC, Pipelined ADC.

TEXT BOOKS:

1. David A. John, Ken Martin, "Analog Integrated Circuit Design".
2. Behagad. Razavi, Design of "Analog CMOS Integrated Circuit".

3. Gray, Huret Lewis, Mayer, John Wiley & Sons," Analysis and design of Analog Integrated Circuits
4. R. Jacob. Baker, "CMOS Circuit design", Layout and Simulation

REFERENCE BOOKS:

1. Mohammed Ismail, Terri Fiez, "Analog VLSI Signal and Information Processing".
2. Randall. L. Geiger, Phillip E. Allen, "VLSI Design, Techniques for Analog and Digital Circuits".