(EC525) ANALOG IC DESIGN

Objective of the Course : *This course imparts the knowledge of analog circuit designs in VLSI with operational amplifier. It also gives the clear knowledge of gain, noice and bandwidth parameters with a simple and multiple stages.*

UNIT - I

Introduction to Analog Deisgn, MOS Transistor basics, I_d equation, V -I Characteristics : Small - Signal model, current sinks, current sources: Simple, Cascode, regulated cascode, regulated cascode, current mirrors: simple, cascode, regulated cascode, Wilson, widers, Voltage reference.

UNIT - II

Single stage amplifiers: Basic concetps, common source amplifier, source follower, common gate amplifier, cascode amplifier, folded cascode amplifier, differential amplifier, Frequency response of amplifiers.

UNIT - III

Feedback: General considerations, feedback topologies, effect of loading, effect of feedback on Noise.

UNIT - IV

Operational Amplifiers: One stage OP- AMP, two stage OP-AMP, Gain boosting, comparison, two stage OP-AMP with constant gm biasing circuit, OP-AMP compenstation, Output stage.

UNIT - V

Noise: Stastical characteristics of Noise, Types of Noise, representation of noise in circuits, Noise in single - stage amplifiers, Noise in differential pairs, Noise bandwidth.

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.