

Analog and Mixed Mode VLSI Design

Subject Code : 06EC63	IA Marks : 25
No. of Lecture Hrs/Week : 04	Exam Hours : 03
Total no. of Lecture Hrs. : 52	Exam Marks : 100

PART – A

UNIT 1

Data converter fundamentals: Analog versus Digital Discrete Time Signals, Converting Analog Signals to Data Signals, Sample and Hold Characteristics, DAC Specifications, ADC Specifications, Mixed-Signal Layout Issues.

06Hours

UNIT 2

Data Converters Architectures: DAC Architectures, Digital Input Code, Resistors String, R-2R Ladder Networks, Current Steering, Charge Scaling DACs, Cyclic DAC, Pipeline DAC, ADC Architectures, Flash, 2-Step Flash ADC, Pipeline ADC, Integrating ADC, Successive Approximation ADC.

14Hours

UNIT 3

Non-Linear Analog Circuits: Basic CMOS Comparator Design (Excluding Characterization), Analog Multipliers, Multiplying Quad (Excluding Stimulation), Level Shifting (Excluding Input Level Shifting For Multiplier).

06Hours

PART B

UNIT 4:

Data Converter SNR: Improving SNR Using Averaging (Excluding Jitter & Averaging onwards), Decimating Filters for ADCs (Excluding Decimating without Averaging onwards), Interpolating Filters for DAC, B and pass and High pass Sync filters.

06Hours

UNIT 5

Su-Microns CMOS circuit design: Process Flow, Capacitors and Resistors, MOSFET Switch (upto Bidirectional Switches), Delay and adder Elements, Analog Circuits MOSFET Biasing (upto MOSFET Transition Frequency).

14Hours

UNIT 6

OPAMP Design (Excluding Circuits Noise onwards)

06Hours

TEXT BOOK:

Design, Layout, Stimulation, R. Jacob Baker, Harry W Li, David E Boyce, CMOS Circuit, PHI Edn, 2005

CMOS- Mixed Signal Circuit Design, R. Jacob Baker, (Vol II of CMOS: Circuit Design, Layout and Stimulation), IEEE Press and Wiley Interscience, 2002.

REFERENCE BOOKS:

Design of Analog CMOS Integrated Circuits, B Razavi, First Edition, McGraw Hill,2001.

CMOS Analog Circuit Design, P e Allen and D R Holberg, Second Edition, Oxford University Press,2002.