

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E. Semester: III

Signal Processing & VLSI Technology (EC)

Subject Name: **Low Power CMOS VLSI Circuit Design (Major Elective IV)**

Subject Code: **732604**

Sr No.	Course Content
1	Low – Power CMOS VLSI Design : Introduction, Sources of Power Dissipation, Static Power Dissipation, Active Power Dissipation, Conclusions
2	Circuit Techniques for Low – Power Design: Introduction, Designing for Low – Power, Circuit Techniques for Power Reduction, Conclusions
3	Low – Power CMOS Logic Circuits: Introduction, Overview of Power Consumption, Low – Power Design Through Voltage Scaling, Estimation and Optimization of Switching Activity, Reduction of Switched Capacitance, Adiabatic Logic Circuits Exercise Problems
4	Low Voltage Low – Power Adders: Introduction, Standard Adder cells, CMOS Adder's Architectures, BICMOS Adder, Low – voltage Low – Power Design Techniques, Current – Mode Adders, Conclusions
5	Low Voltage Low – Power Multipliers: Introduction, Overview of Multiplication, Types of Multiplier Architectures, Braun Multiplier, Baugh – Wooley Multiplier, Booth Multiplier, Wallace Tree Multiplier, Conclusions
6	Low Voltage Low – Power Read – Only Memories: Introduction, Types of ROM, Basic Physics of Floating Gate Nonvolatile Devices, Floating Gate Memories, Basics of ROM, Low – Power ROM Technology, Future Trend and Development of ROMs, Conclusions
7	Low Voltage Low – Power Static Random–Access Memories: Introduction, Basic of SRAM, Memory Cell, Precharge and Equalization circuit, Decoder, Address Transition Detection (ATD), Sense Amplifier, Output Latch, Low – Power SRAM Technologies, Future Trend and Development of SRAM, Conclusions
8	Low Voltage Low – Power Dynamic Random – Access Memories: Introduction, Types of DRAM, Basics of DRAM, Self – Refresh Circuit, Half – Voltage Generator (HVG), Back – Bias Generator (BVG), Boosted-Voltage Generator (BVG), Reference – Voltage Generator (BVG), Voltage –Down Converter (VDC), Future Trend and Development of DRAM, Conclusions

Behavioral Level Transforms, Algorithm and Architecture Level Transforms for Low Power, Multiple and Dynamic Supply Design, Gated Clocking, Conclusions

Reference Books:

1. Low- Voltage, Low Power, VLSI Subsystems, Kiat-Seng Yeo ,Kaushik Roy, TATA McGraw-HILL EDITION.
2. CMOS Digital Integrated Circuits, 3rd Edition, Sung-Mo Kang, Yusuf Leblebici , TATA McGraw-HILL EDITION.
3. Low-Power Cmos Vlsi Circuit Design by Kaushik Roy, Sharat C. Prasad, Willey India Edition
4. Low-power CMOS design, Anantha P. Chandrakasan, IEEE press.