NPTEL Video Course - Electronics and Communication Engineering - NOC:Design and Analysis of VLSI Subsystems

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Co-ordinating Institute - IIT - Madras

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Understanding Silicon
Lecture 2 - Introduction to NMOS
Lecture 3 - NMOS Transistor Working
Lecture 4 - PMOS Transistor
Lecture 5 - MOS Capacitances
Lecture 6 - Non Ideal MOS model
Lecture 7 - Short channel current model
Lecture 8 - Short channel current model analysis
Lecture 9 - Channel Length modulation index
Lecture 10 - DC characteristics of Inverter
Lecture 11 - Transfer characteristics of Inverter
Lecture 12 - Skewed Inverter
Lecture 13 - Skewed Inverter and threshold voltage
Lecture 14 - Equivalent of transistors in series
Lecture 15 - Transmission Gate
Lecture 16 - Bad CMOS Buffer - Part 1
Lecture 17 - Bad CMOS Buffer - Part 2
Lecture 18 - Noise margin characteristics of inverter
Lecture 19 - Noise margin parameters
Lecture 20 - Introduction to Delay in CMOS
Lecture 21 - Transient analysis of CMOS Inverter
Lecture 22 - RC approximated delay
Lecture 23 - Switching Resistance
Lecture 24 - CMOS Inverter approximated to RC Circuit
Lecture 25 - Elmore delay
Lecture 26 - Delay of FO4 inverter
Lecture 27 - Extracting capacitances of 3-Nand gate for delay estimation
Lecture 28 - Characterizing Delay of NOR gate
Lecture 29 - Linear Delay model

Lecture 30 - Logical effort and Parasitic delay
Lecture 31 - Logical effort and Parasitic delay for different gates
Lecture 32 - Logical effort for short-channel current model
Lecture 33 - Ring Oscillator design
Lecture 34 - Optimizing Gate Size
Lecture 35 - Optimizing Gate Sizes Example
Lecture 36 - Optimizing the Stages for an inverter path
Lecture 37 - Optimizing the Stages for a General Circuit
Lecture 38 - Decoder Design
Lecture 39 - Introduction to Combinational Circuit and assymetric gates
Lecture 40 - Assymetric Gates analysis
Lecture 41 - Assymetric Gates analysis using short-channel current model
Lecture 42 - Introduction to Skewed gates
Lecture 43 - Skewed gates and best P/N ratio
Lecture 44 - vIntroduction to Pseudo NMOS
Lecture 45 - Psudeo NMOS gates
Lecture 46 - Other Logic Family
Lecture 47 - Dynamic Logic and Domino logic
Lecture 48 - Domino gates
Lecture 49 - Introduction to Stick Diagram
Lecture 50 - Stick Diagram for different gates
Lecture 51 - Applying Eulers path for stick diagram representations
Lecture 52 - Multiplexer design and layout
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Lecture 54 - Interconnects - RC delay, and Energy
Lecture 55 - Introduction to crosstalks in interconnects
Lecture 56 - Transient analysis in Crosstalk
Lecture 57 - Introduction to Repeaters in Interconnect Engineering
Lecture 58 - Repeater Design
Lecture 59 - Energy and delay analysis for interconnectwith repeaters
Lecture 60
Lecture 61 - Introduction to Power
Lecture 62 - Switching Power and Energy Estimation
Lecture 63 - Activity factor and estimating dynamic power for a combinational circuit design
Lecture 64 - Analyzing Dynamic Power
Lecture 65 - Energy estimation through driving factor
Lecture 66 - Energy expression in terms of delay
Lecture 67 - Voltage Scaling
Lecture 68 - DVFS