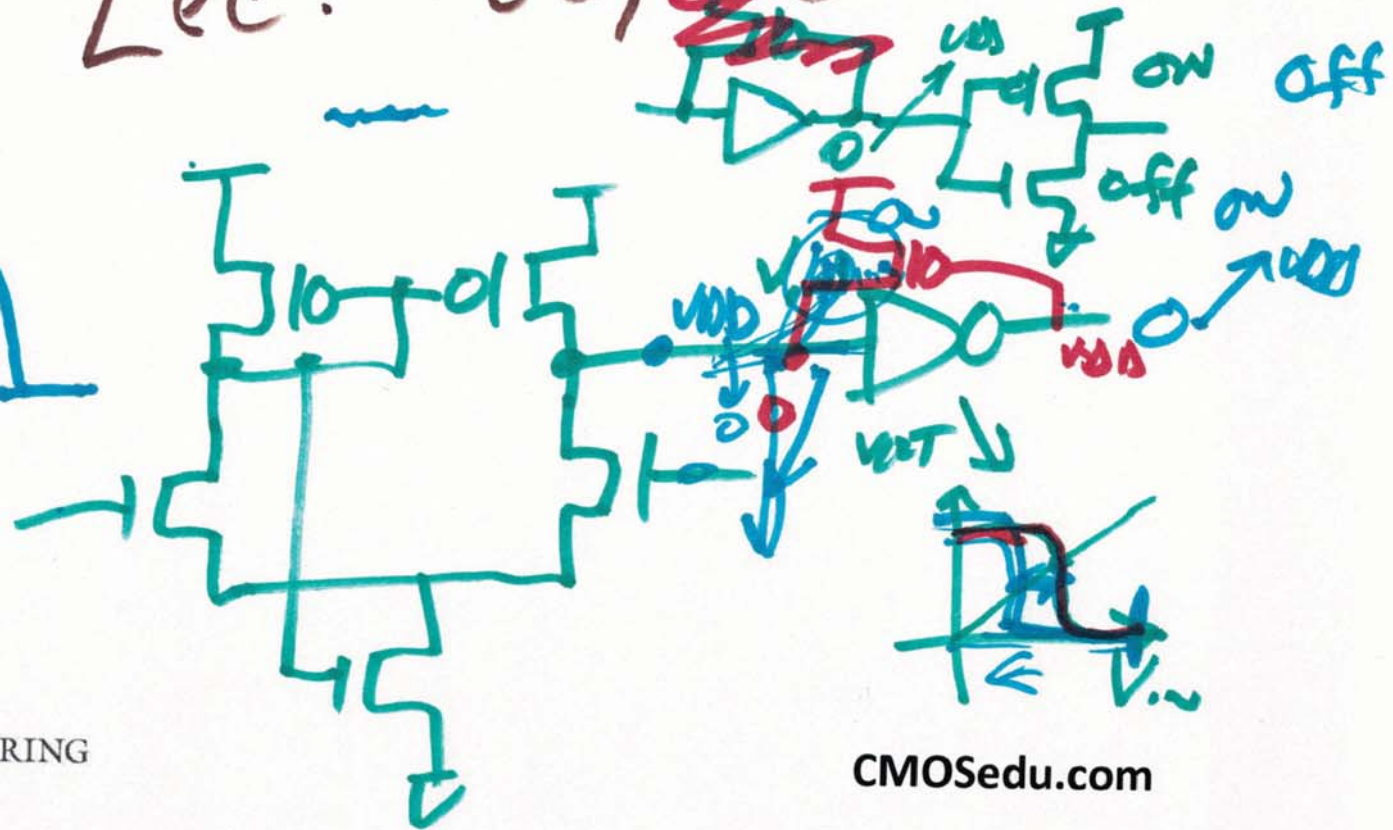
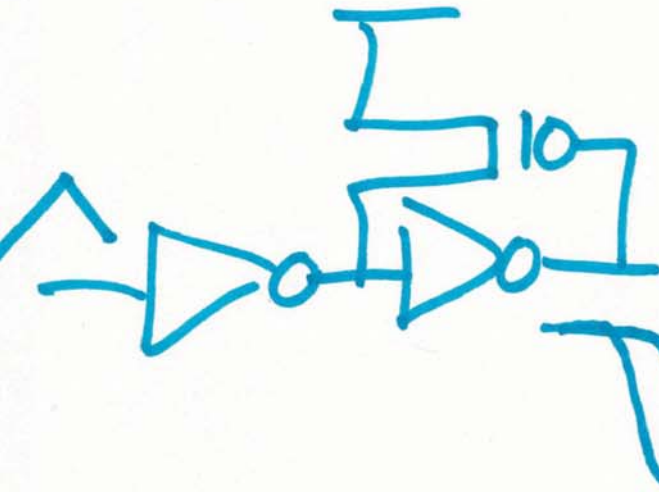
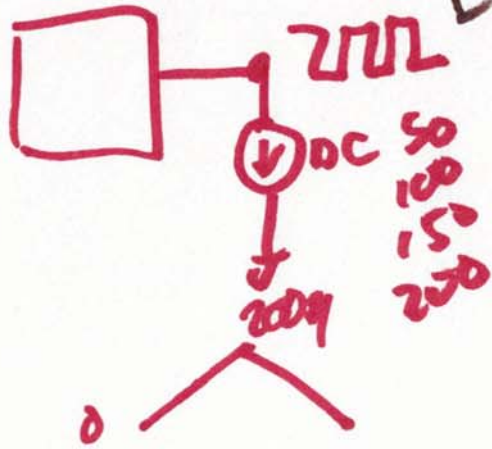


EE 421 / ECG 621

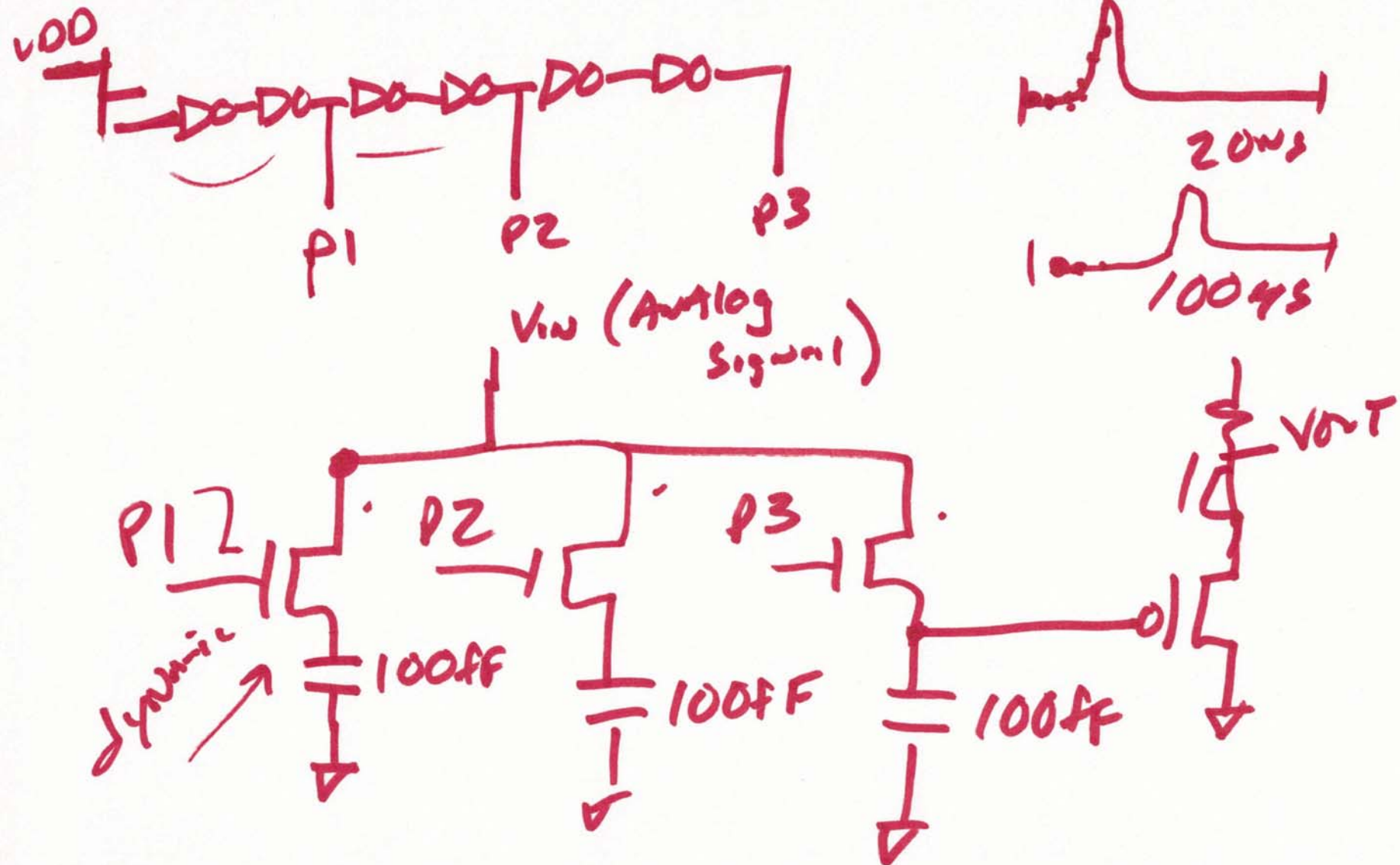
# Digital IC Design

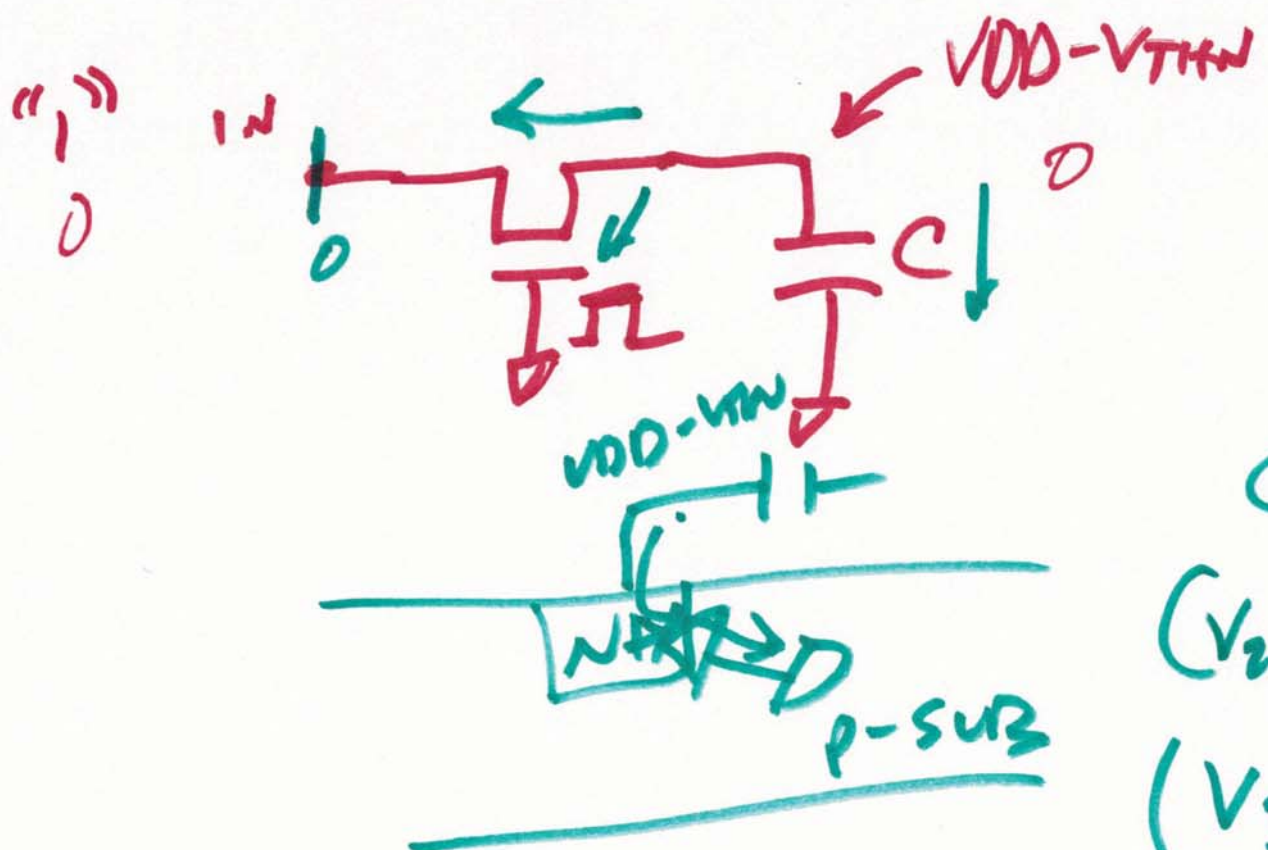
Nov. 25, 2015

Lec. 25, 2015

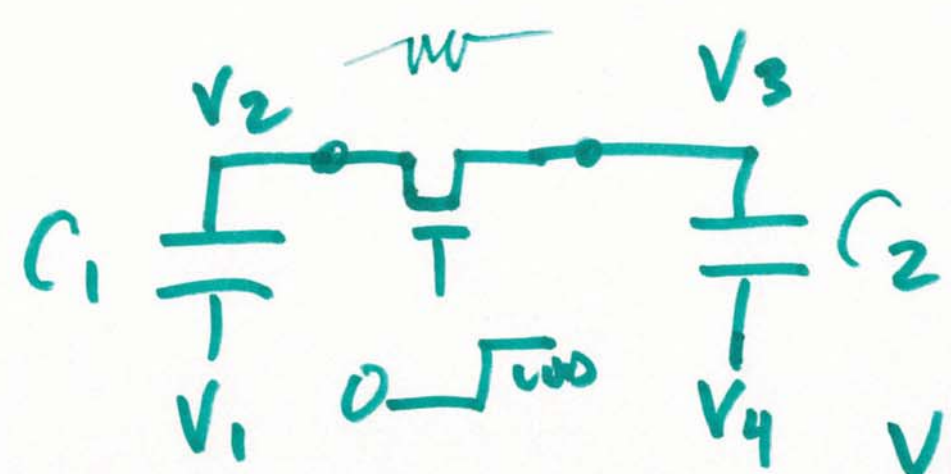


# DYNAMIC circuit

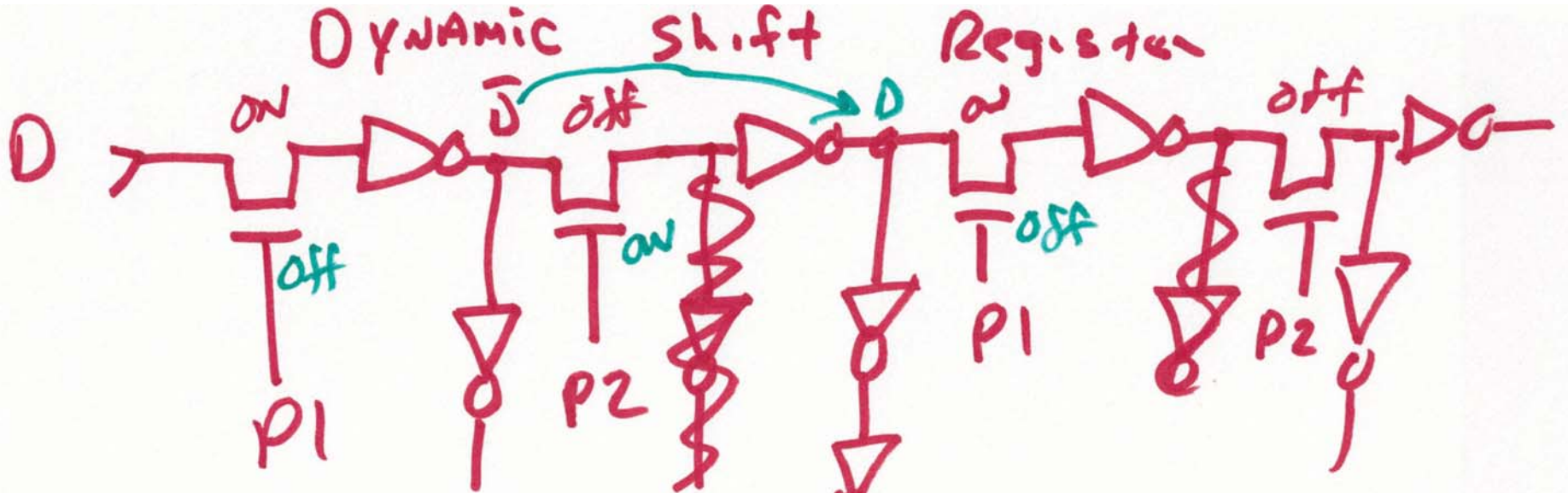




$$\begin{aligned}
 CV &= Q \\
 (V_2 - V_1)C_1 + \\
 (V_3 - V_4)C_2 \\
 &= (V_f - V_1)C_1 \\
 &+ (V_f - V_4)C_2 \\
 V_f &= \frac{V_2C_1 + V_3C_2}{C_1 + C_2}
 \end{aligned}$$



3)



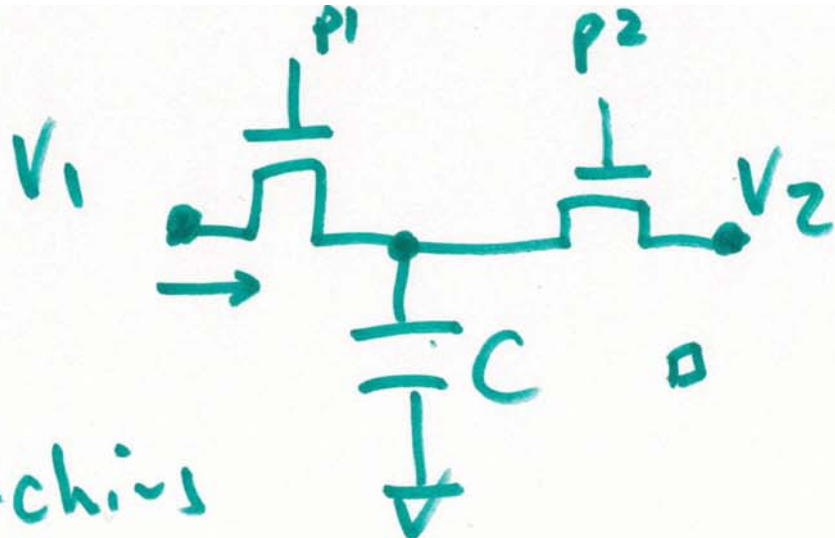
$P1 = h$   
 $P2 = 0$

$P1 = 0$   
 $P2 = h$

NON-OVERLAPPING  
 Clocks

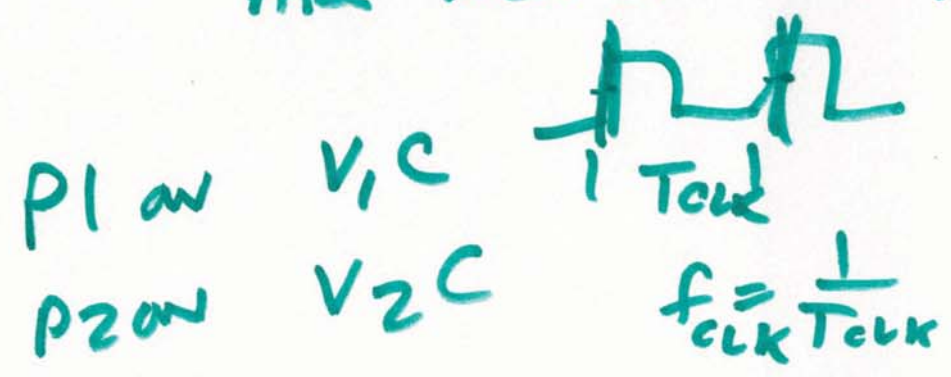


4)



Switching capacitance

P1 & P2 are non-overlapping



$$I_{avg} = \frac{V_1 C - V_2 C}{T_{clk}} = C(V_1 - V_2) \cdot f_{clk}$$

$$R_{sc} = \frac{V_1 - V_2}{I_{avg}} = \boxed{\frac{1}{f_{clk} \cdot C}}$$

$R_{sc} = 10 \text{ MEH} , C = 100 \text{ fF}$

$f_{clk} = \frac{1}{10^7 \cdot 10^{-13}} = 1 \text{ MHz}$

# NON-overlapping clocks

