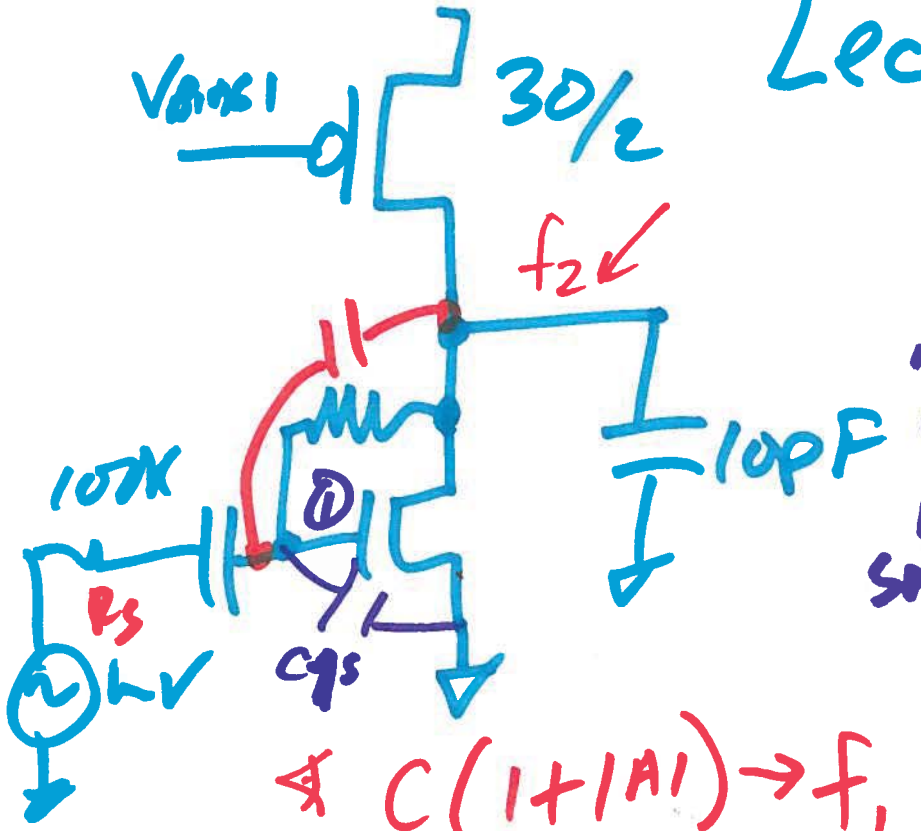
# EE 420 /ECE 620
# Analog IC Design
## March 22, 2017
## Lecture 17




$f_1 = \frac{1}{2\pi \cdot 100K\,(23.4fF + 1.8fF)} \Subset 25fF = C_1$

$= 63MHz$

input not pole splitting

wrong! -5

$\star\ C(1+|A|) \rightarrow f_1 \approx \frac{1}{2\pi R_s C(1+|A|)}$

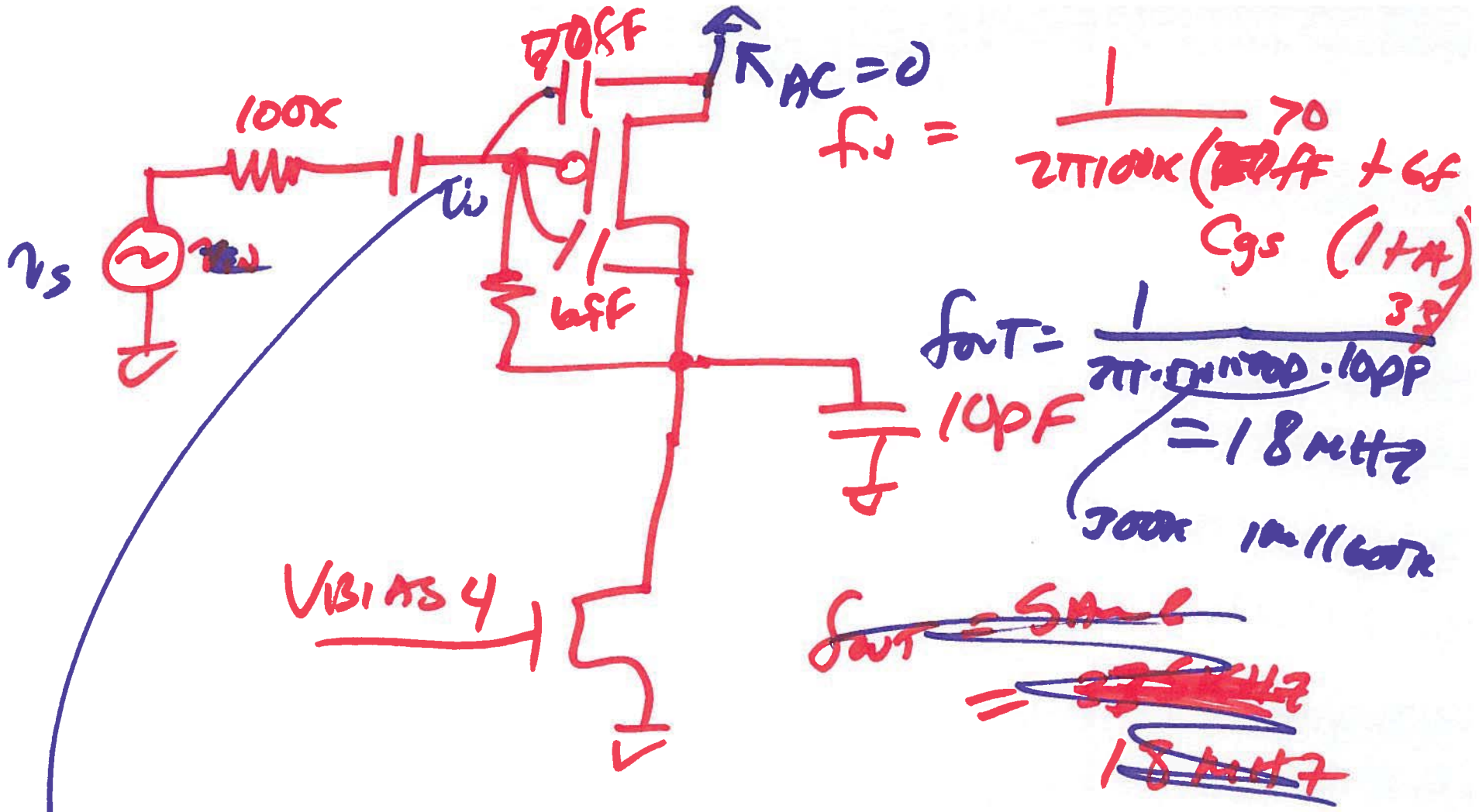
$g_m$ rolling off

$$f_{in} = \frac{1}{2\pi \cdot 100k\,(23.2ff + 2f(1+33))}$$

$$= 2.4\,MHz \qquad 18\,MHz$$

$$f_{OUT} = \frac{1}{2\pi \cdot r_{mirror} \cdot 10pF} = 7.8kHz$$

$r_{mirror}$: $1M \| 600k = 375k$, $300k$




$$f_{IN} = \frac{1}{2\pi \cdot 100K \cdot \left(70fF + 6fF\left(1 + \frac{A}{90}\right)\right)}$$

$$= 2.6MHz$$

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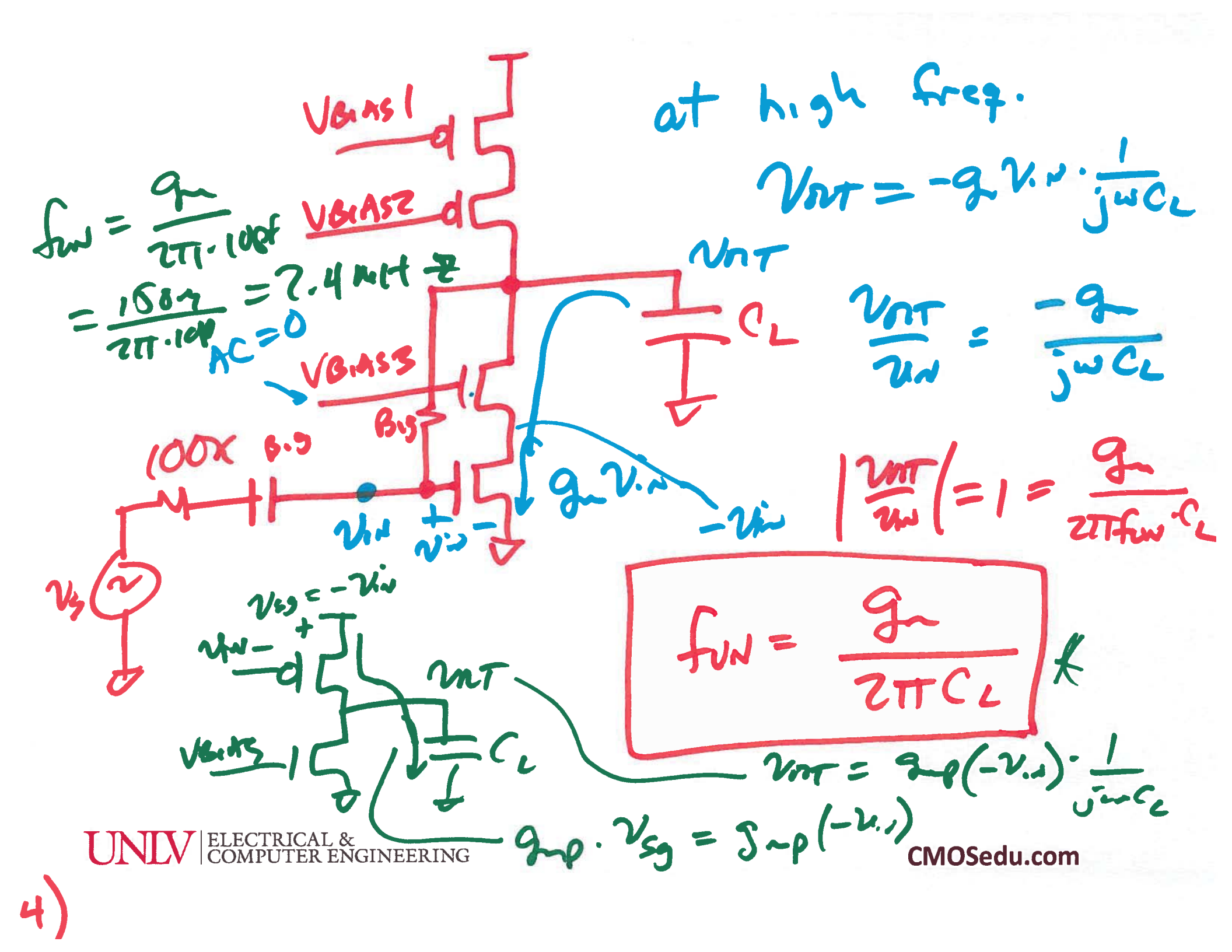
3) $f_{OUT} = \frac{1}{\pi \cdot 300K \cdot 10pF} = 53KHz$

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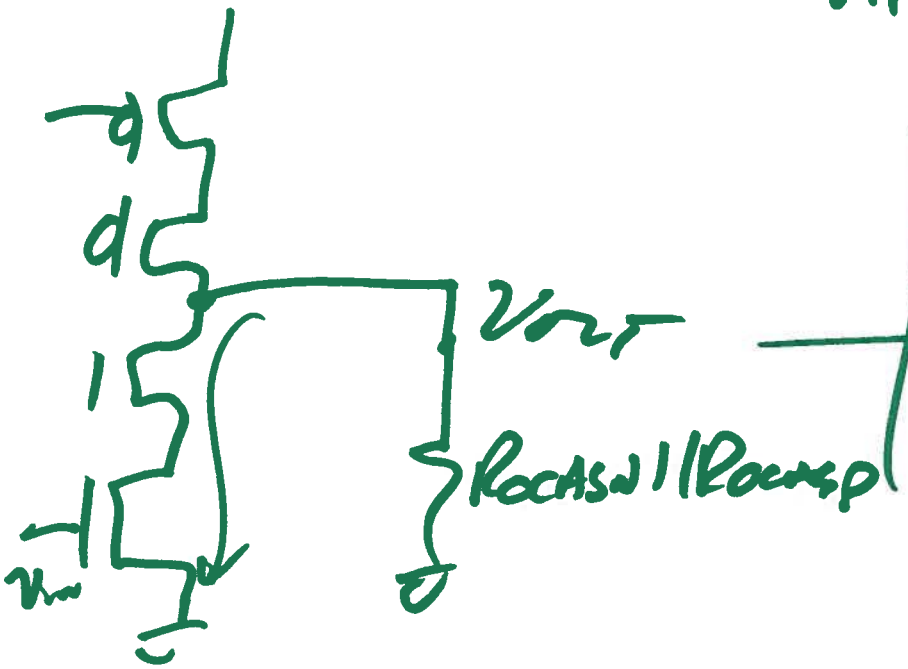
4)

$$f_{UW} = \frac{g_m}{2\pi C_L} = \frac{150\mu}{2\pi \cdot 10p} = 2.4\,MHz$$

$$f_z = \frac{g_{m2}}{2\pi \cdot 10pF} = 2.4\,MHz$$




$$f_{OUT} = \frac{1}{2\pi \cdot R_{OCASN} // R_{OCMSP} \cdot 20pF}$$

$$f_{UW} = \frac{1}{2\pi \cdot 10^{9} \cdot 20 \cdot 10^{-12}}$$

$$= \frac{1}{2\pi \cdot 20 \cdot 10^{-3}}$$

$$= \frac{0.159}{0.2} = 7\,Hz$$

$$\frac{V_{OUT}}{V_{in}} = -g_m \cdot R_{OCASN} // R_{OCMSP}$$

21.65

$$f_1 \simeq \frac{1}{2\pi \cdot 150\mu \cdot 1G \cdot 100k \cdot 10pF} = 1\ Hz$$

21.66

$$f_2 \simeq \frac{150\mu}{2\pi(C_1 + C_1 + C_2)_{10p}} = \frac{15\mu}{2\pi 10p} = 2.4\ MHz$$