

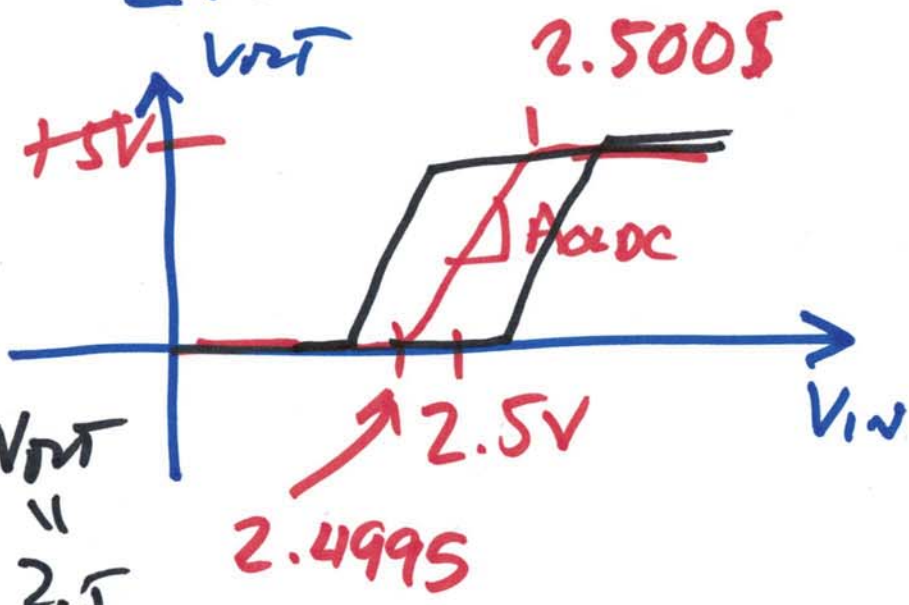
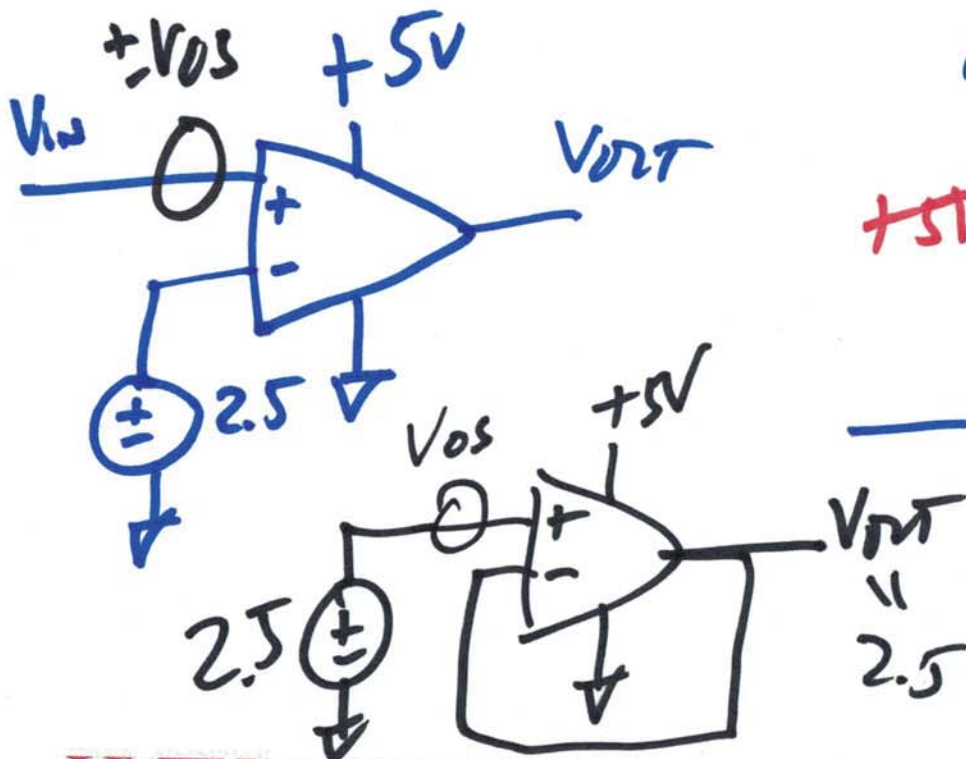
ECC 720

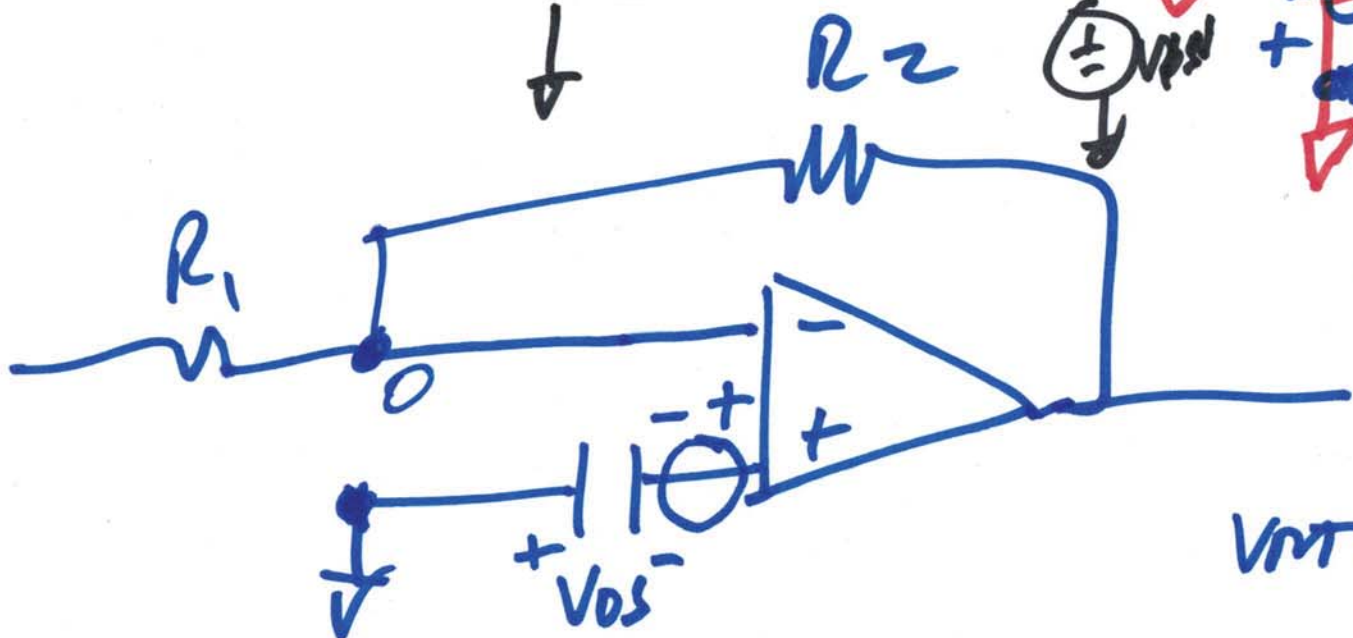
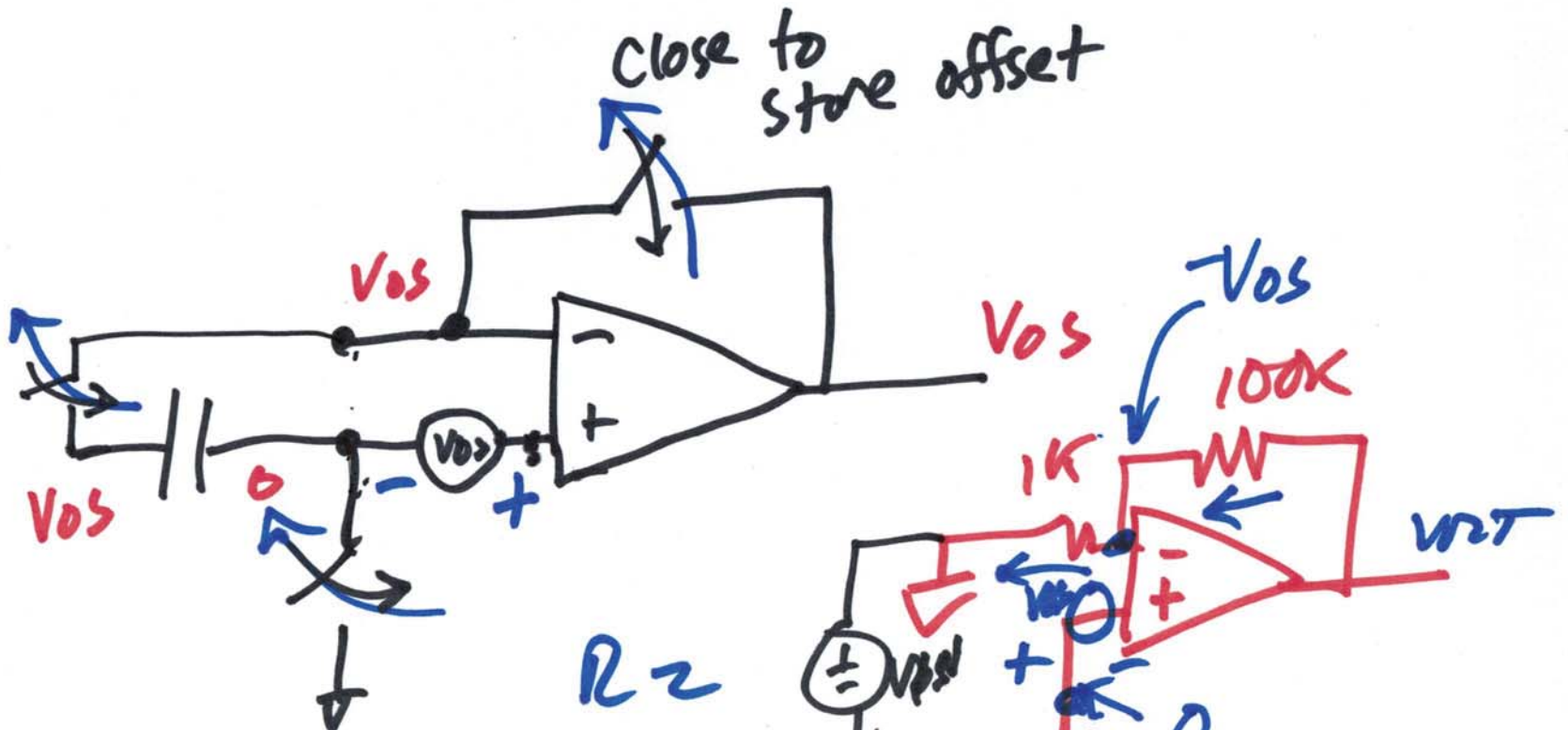
Advanced Analog

IC Design

MARCH 8, 2016

Lecture 15

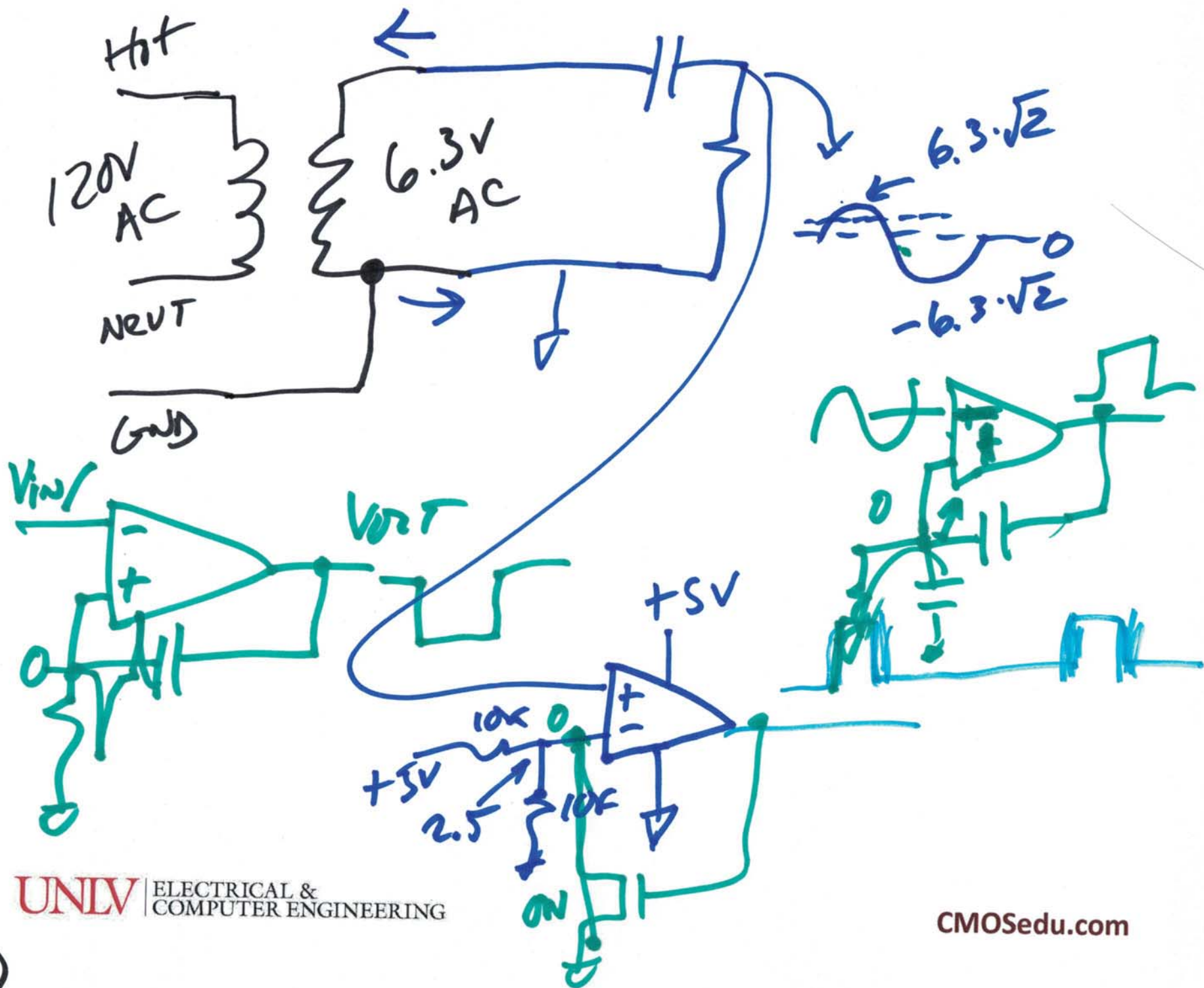




$$\frac{-V_{os}}{1k} = \frac{V_{out} - (-V_{os})}{100k}$$

$$V_{out} = 101 V_{os} + 101 V_{in}$$

2)



3)

Quizzes, H.W., E.O.C
 Examples in the Chap.

Analog Filter Design

Bilinear

Bi quadratic filters



Q peaking

$Q=0$

$Q=\infty$

S.C.

OTA-C

ACTIVE-RC

$\frac{1}{\infty}$

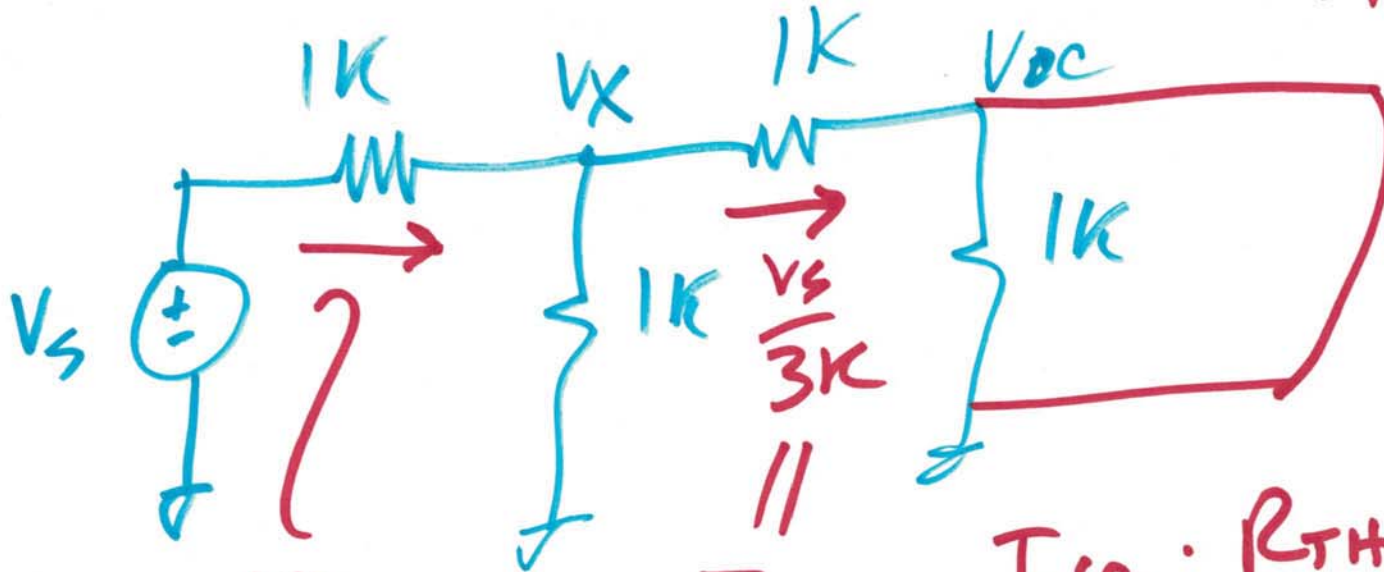
Review S.C. integrator

$$\frac{V_{out}}{V_{in}} = \frac{C_1}{C_F} \cdot \frac{z^{-1}}{1-z^{-1}}$$

A)

Ch. 8 noise

$$R_{TH} = 1k || 1.5k$$



$$\frac{V_s}{1.5k}$$

I_{sc}

$$I_{sc} \cdot R_{TH}$$

$$V_{oc} = \frac{V_s}{3k} \cdot 1k || 1.5k$$



$$\sqrt{4kT \cdot 1k || 1.5k}$$

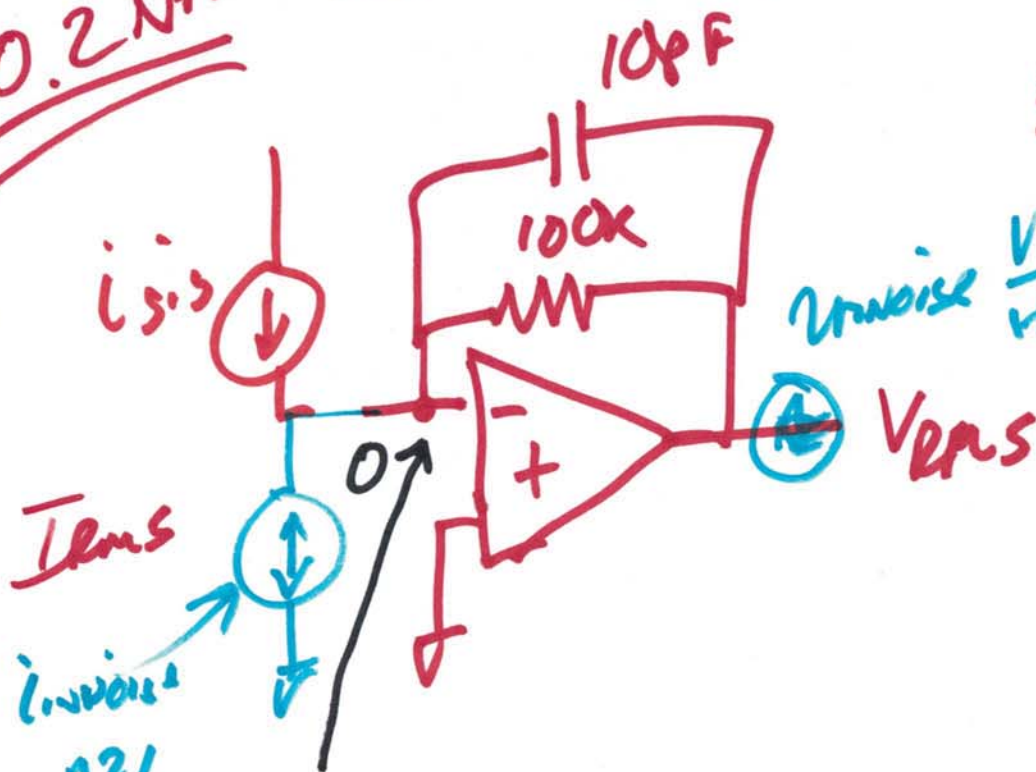
$$\downarrow$$

$$\frac{V_{rms}}{\sqrt{Hz}}$$

Assuming An ideal op-amp

$$\frac{20\mu\text{V}}{100\text{K}} = \underline{\underline{0.2\text{ nA}}}$$

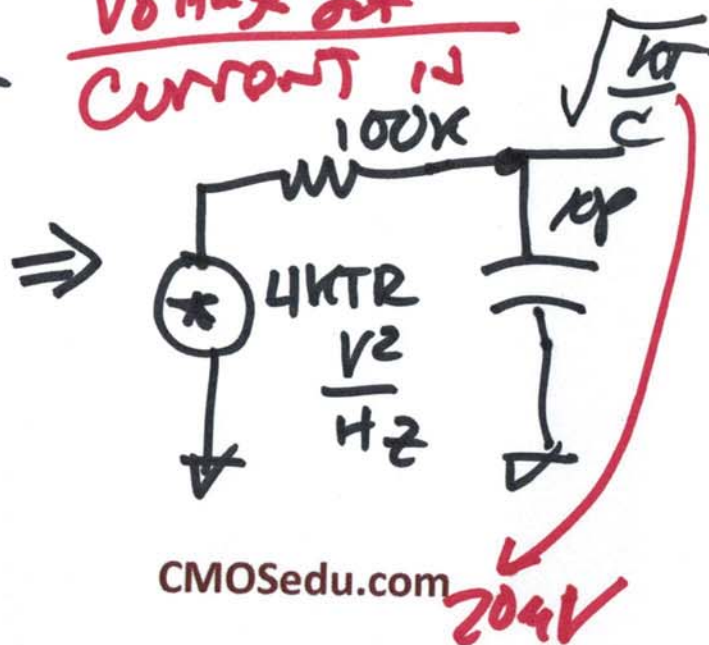
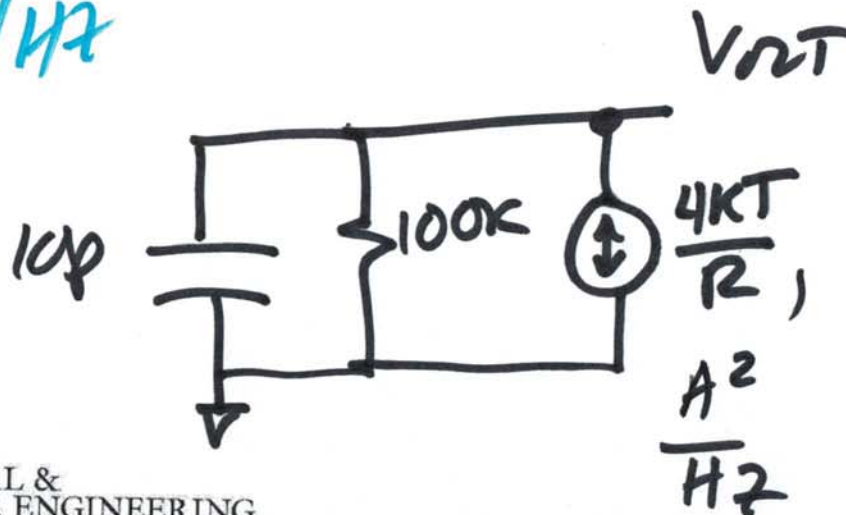
Estimate
input-referred
& output
noise



Transimpedance
Amplifier

Voltage out
CURRENT IN
(TIA)

$$\frac{T \cdot \text{sig}}{\sqrt{F \cdot K}} \text{ SNR} \propto \sqrt{F}$$

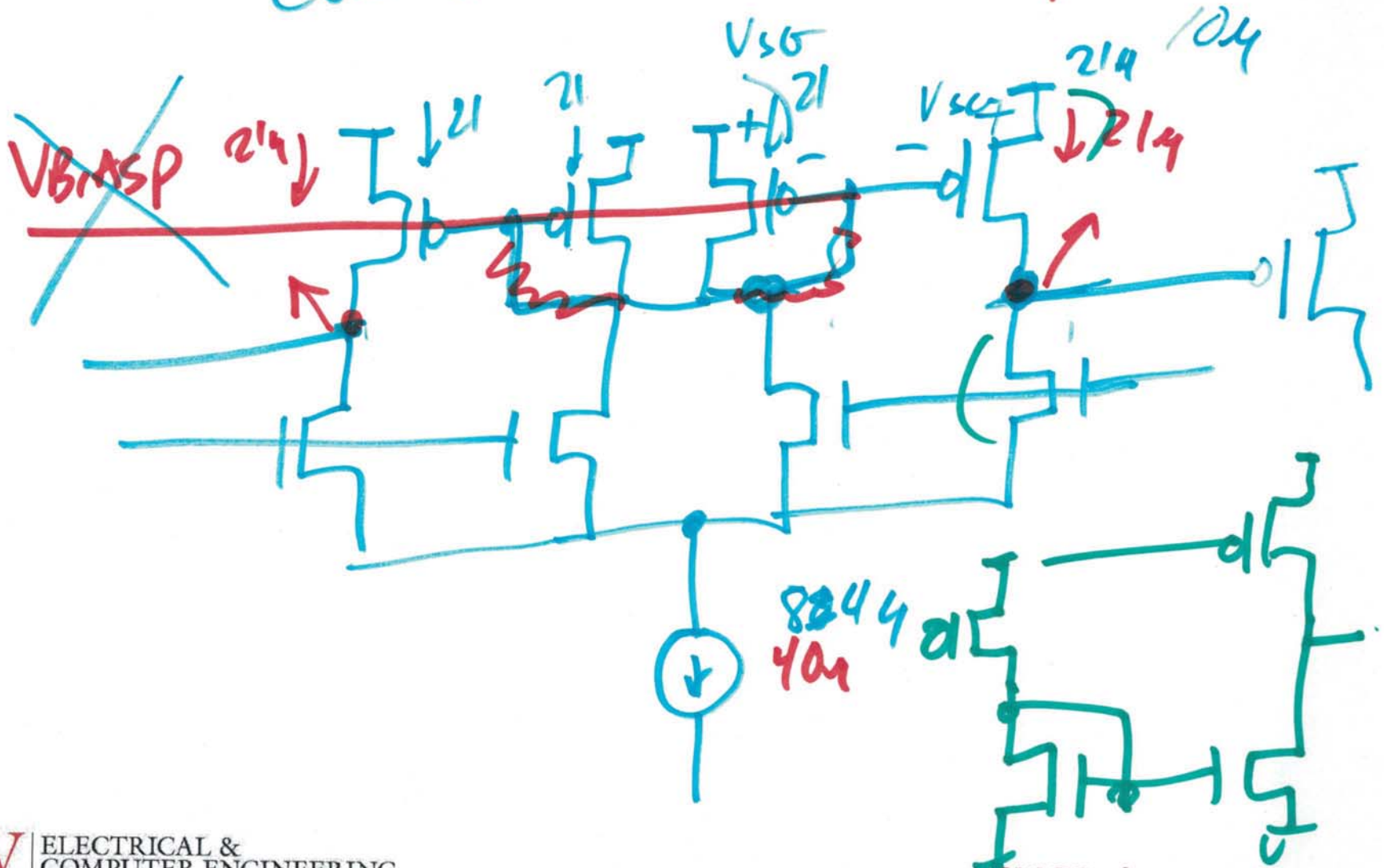
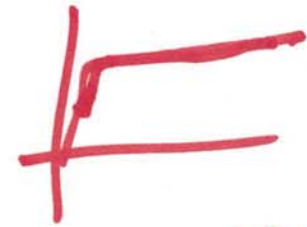


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20uV

Ch 26

Conceptual design



7)