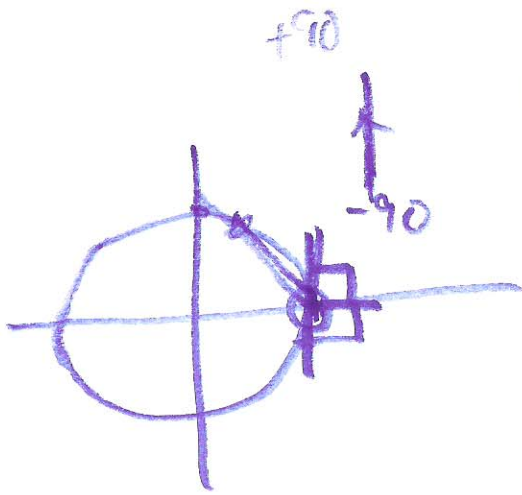


ECG 722

CMOS Mixed-Signal Design

OCT. 13, 2014



$$-j2\pi f \cdot 20ns$$

$$v_{out} = v_{in} - v_{out}e^{-j2\pi f \cdot 20ns}$$

Review for mid term

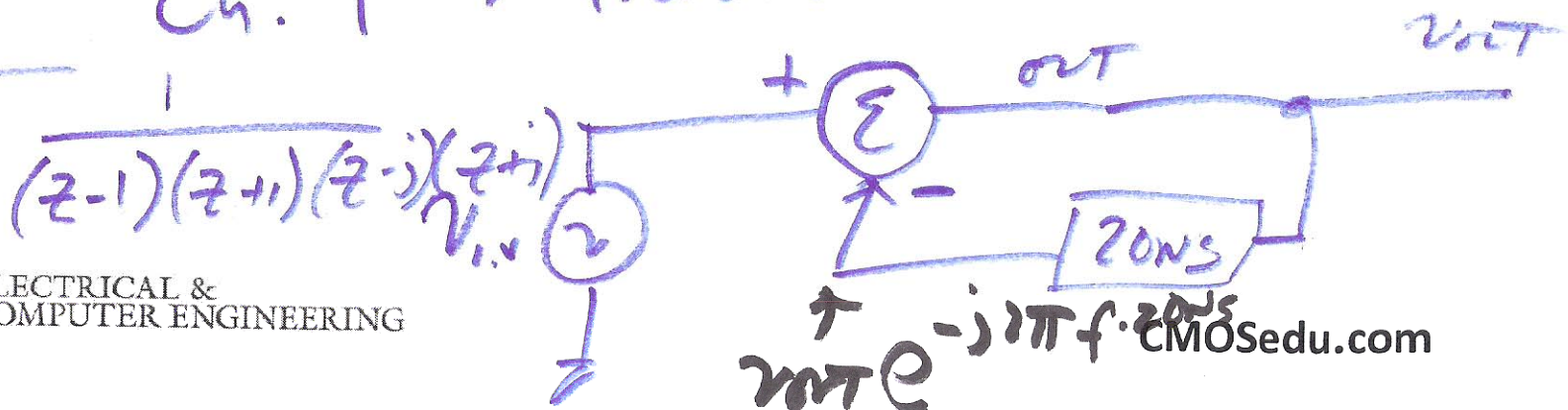
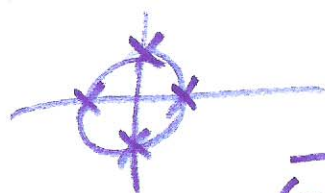
Lecture 14

Review EOC problems

Review Quizzes & H.W.

xfer function  
z-plane  
I/O

Ch. 1 → transfer functions



1)

Ch. 2

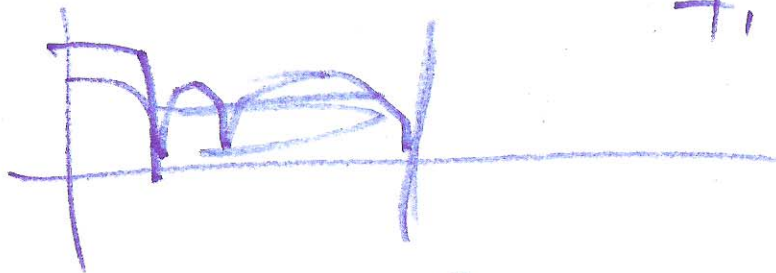
Sampling & Aliasing

S/H, T/H

impulse sampling

Decimation & interpolation

filter topologies



→ DAI - transfer functions

$$\frac{z^{-1}}{1-z^{-1}}$$

# Ch. 4

## Digital filters

Stability

Bandpass  
filters

How word size changes  
impulse

~~step~~ response & why

Decimation

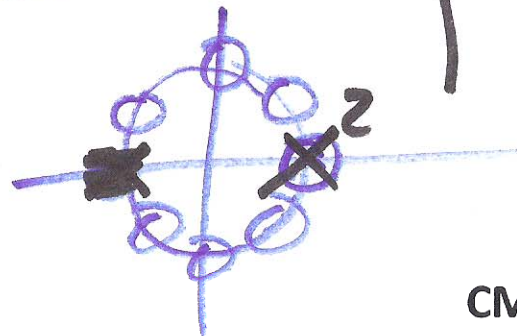
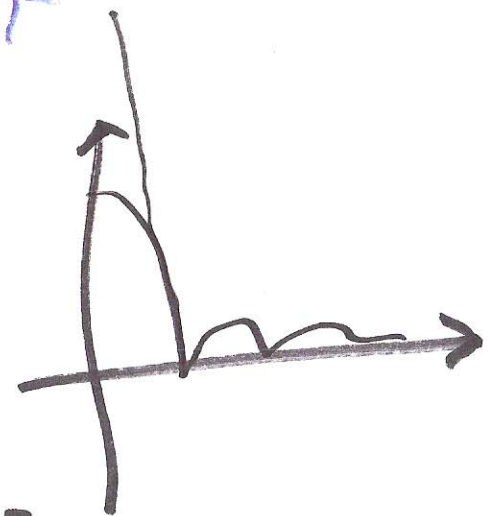
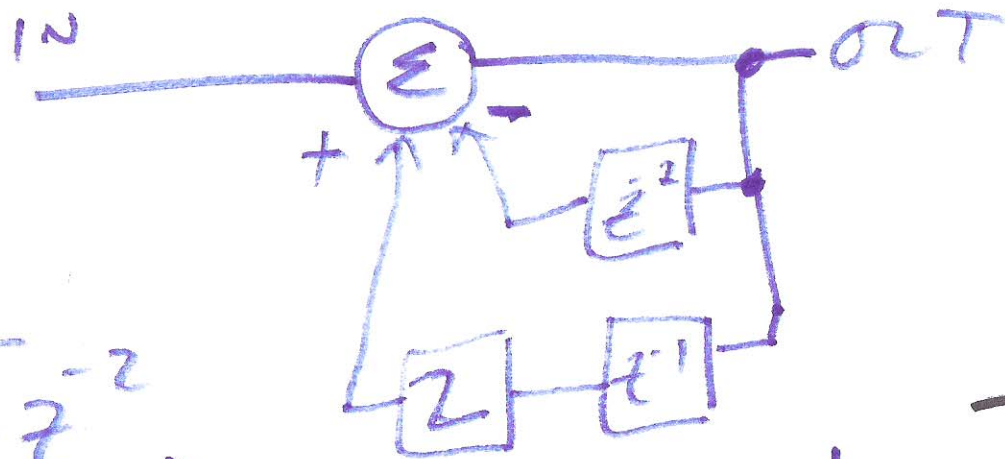
Interpolation

$$\frac{1 - z^{-8}}{1 - z^{-1}}$$

$$\frac{OUT}{IN} = \frac{1}{1 - 2z^{-1} + z^{-2}} = \frac{z^2}{(z-1)(z-1)}$$

$$OUT = IN + 2OUTz^{-1} - OUTz^{-2}$$

$$\frac{1 - z^{-2}}{1 - 2z^{-1} + z^{-2}}$$



Signal-to-noise Ratio

Effective # of bits

Average

jitter

Bennett's criteria

Quantization

Spectral density

$SNR \approx SNDR (SINAD)$

↓

~~SINAD~~  
Q.V