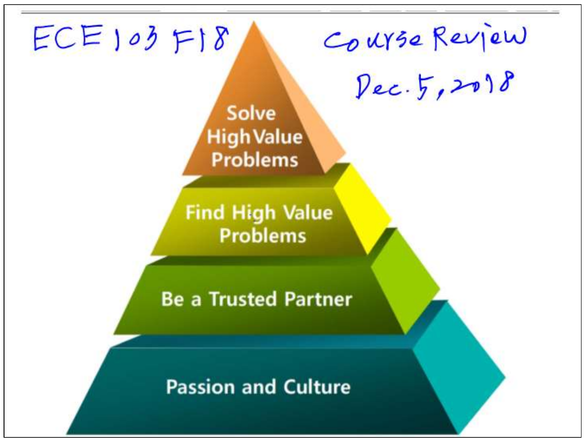
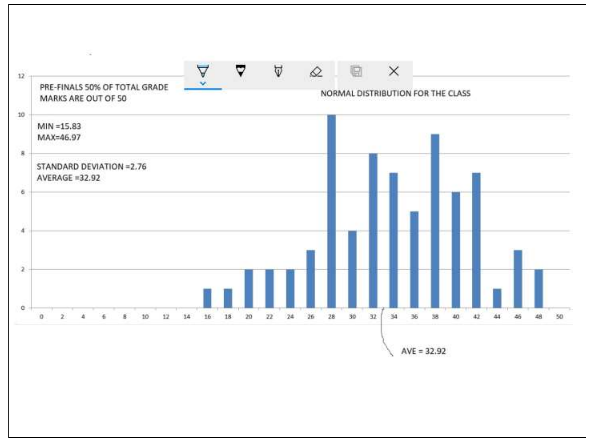
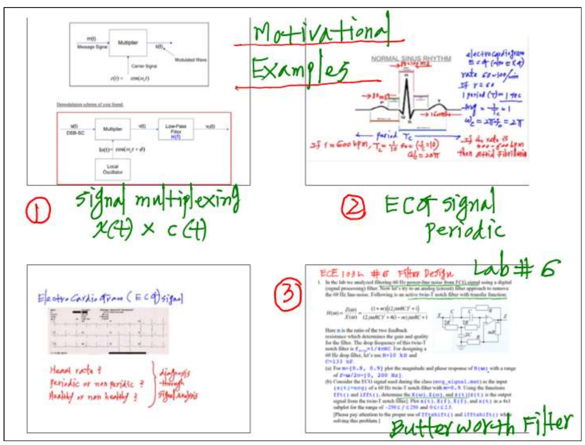
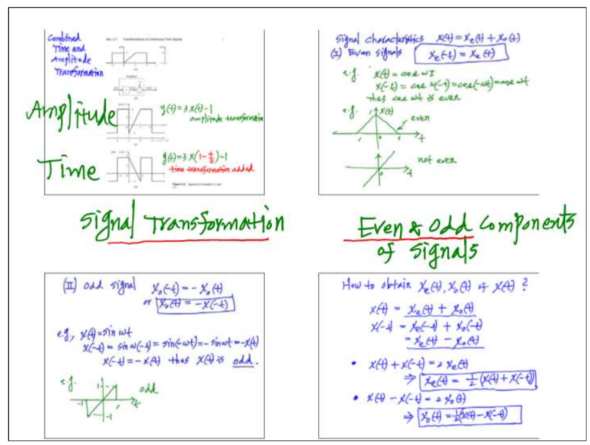
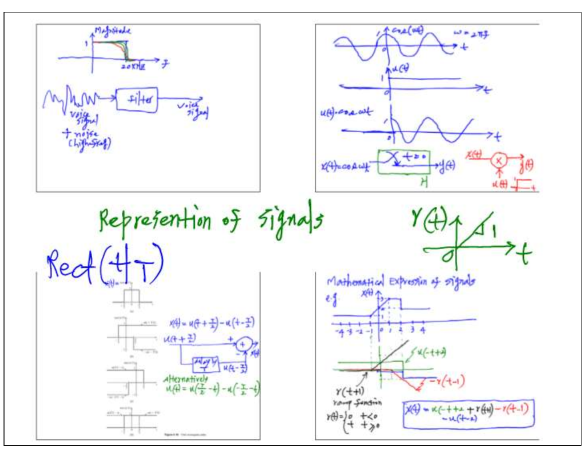
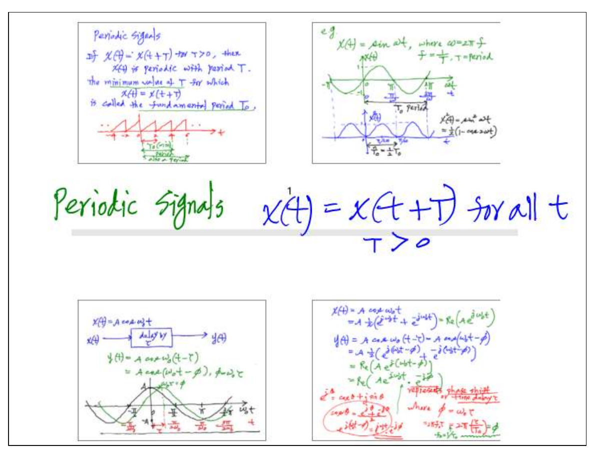

ECE 103 F18
Course Review
Dec. 5, 2018
Solve High Value Problems
Find High Value Problems
Be a Trusted Partner
Passion and Culture

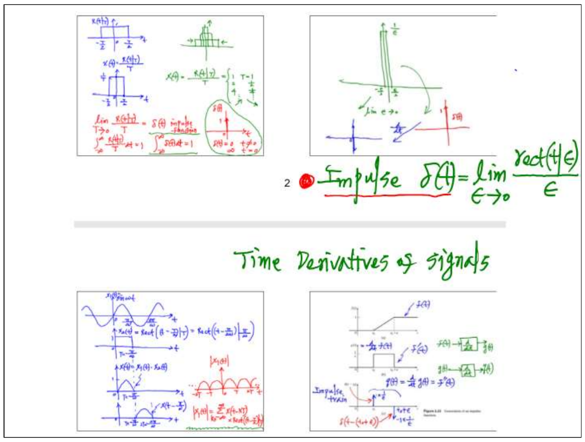

PRE-FINALS 50% OF TOTAL GRADE
MARKS ARE OUT OF 50
NORMAL DISTRIBUTION FOR THE CLASS
MIN =15.83
MAX=46.97
STANDARD DEVIATION =2.76
AVERAGE =32.92
AVE = 32.92


Motivational Examples
① signal multiplexing
x(t) × c(t)
② ECG signal
Periodic
NORMAL SINUS RHYTHM
③ Lab # 6
Butterworth Filter


Amplitude
Time
Signal Transformation
Even & Odd Components of Signals


Represention of Signals
Rect(t/T)
Mathematical Expression of Signals


Periodic Signals
x(t) = x(t+T) for all t
T > 0


Impulse δ(t) = lim ε→0 rect(t|ε)/ε
Time Derivatives of signals

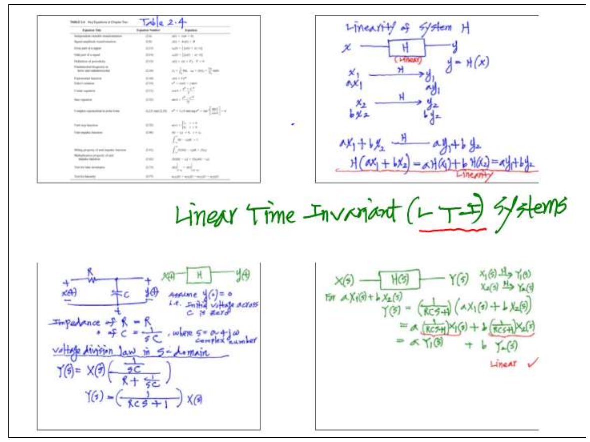
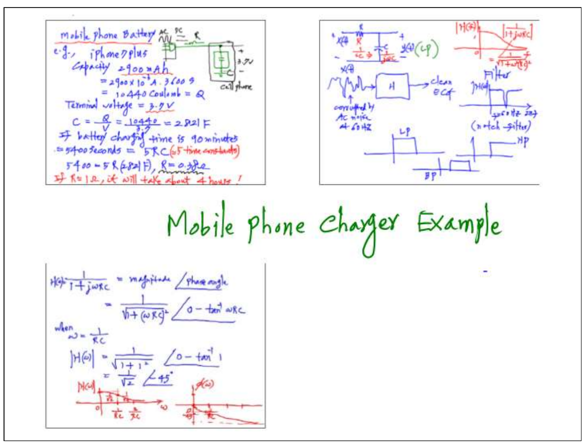
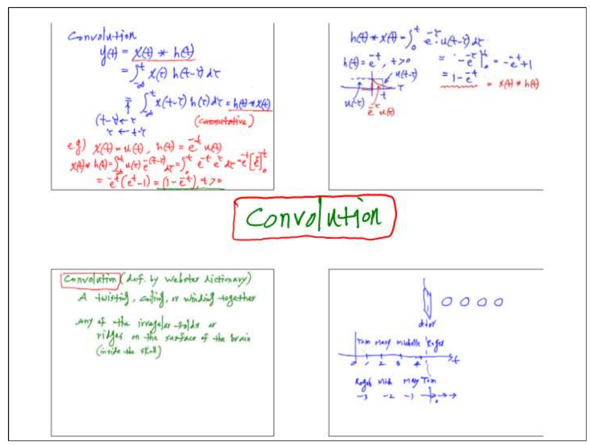
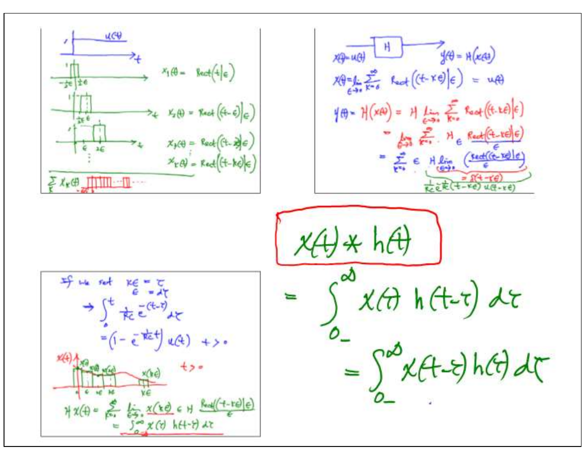
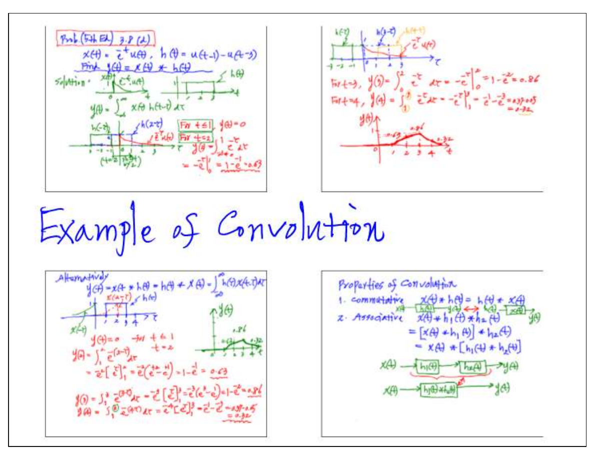


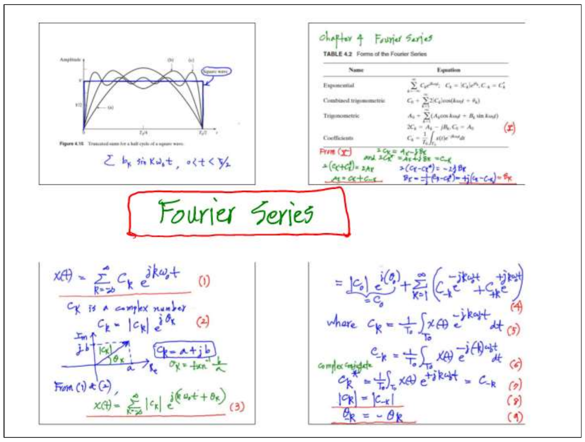
Table 2.4
Linearity of System H
Linear Time Invariant (L T I) Systems

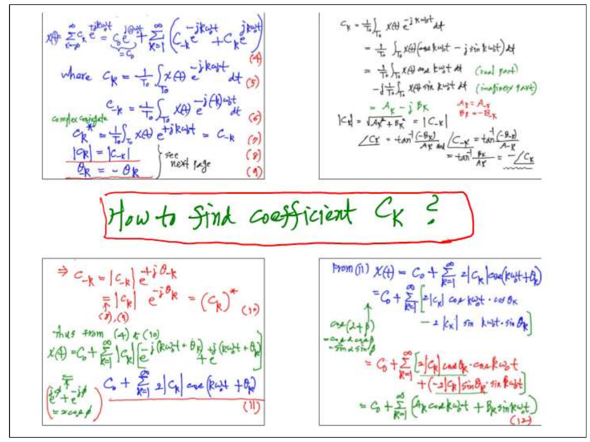

Mobile phone Charger Example

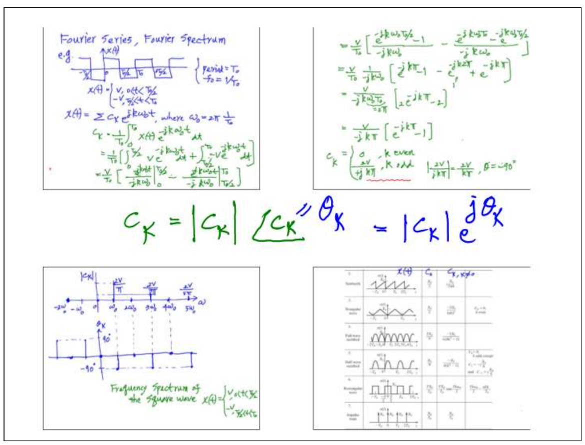

Convolution

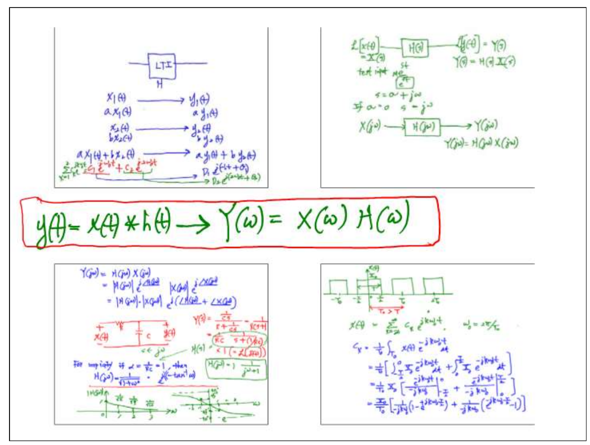

x(t) * h(t)

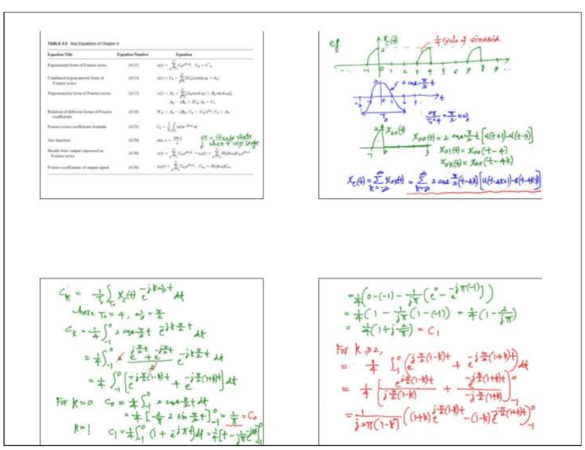

Example of Convolution

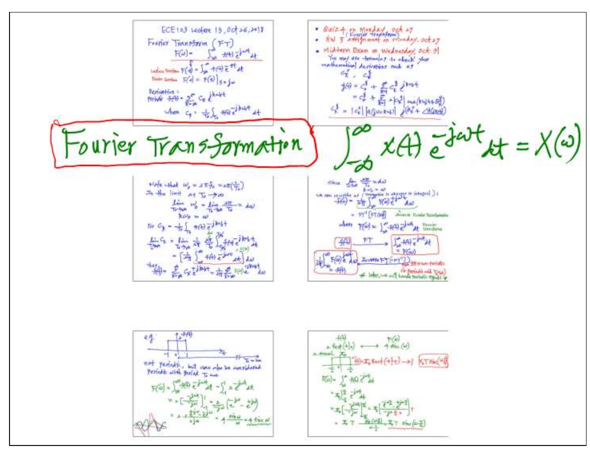

Fourier Series

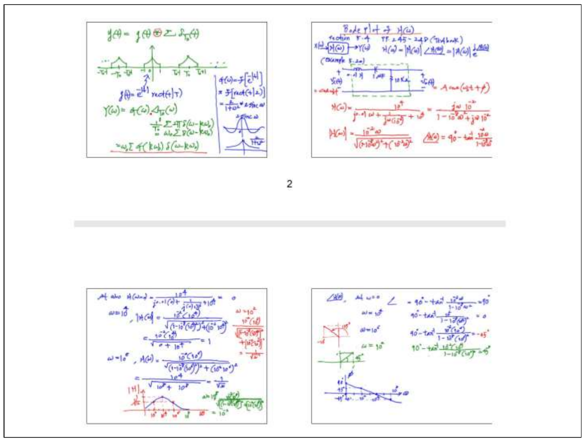

How to find coefficient C_K ?

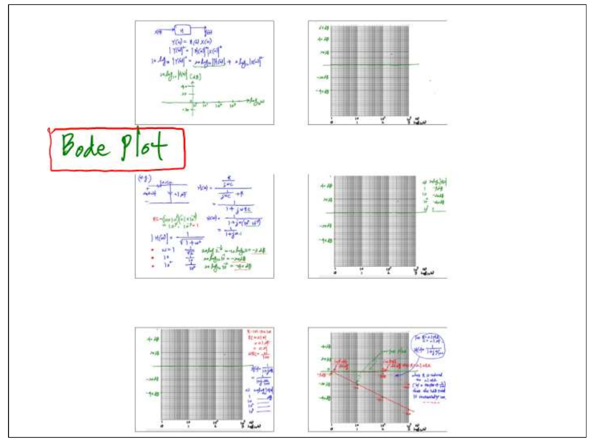

$C_K = |C_K| \angle C_K = |C_K| e^{j\theta_K}$

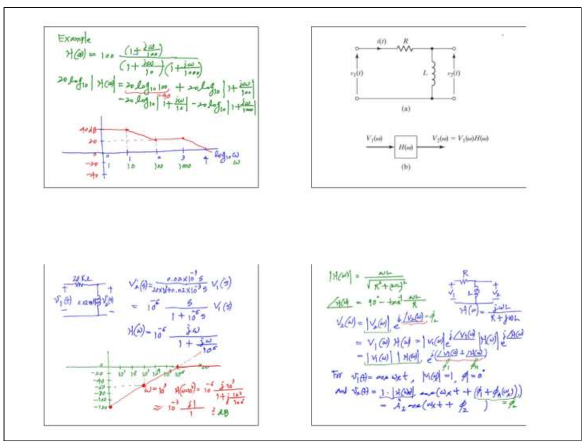

$y(t) = x(t) * h(t) \rightarrow Y(\omega) = X(\omega) H(\omega)$

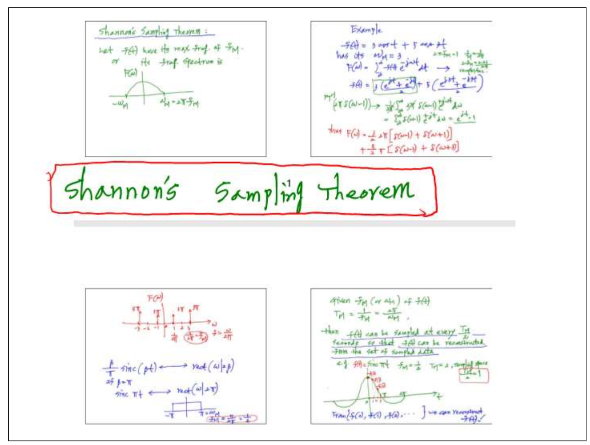


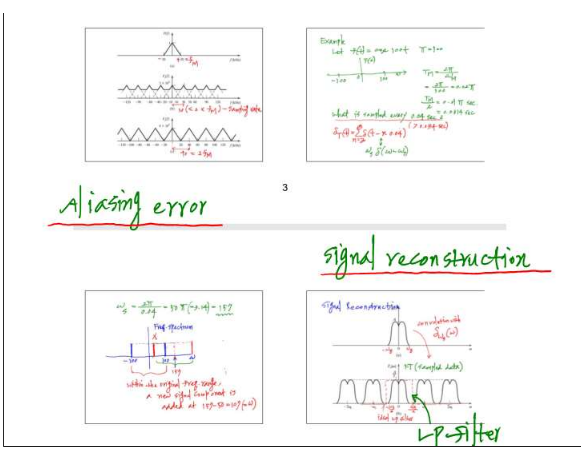

Fourier Transformation $\int_{-\infty}^{\infty} x(t) e^{-j\omega t} dt = X(\omega)$

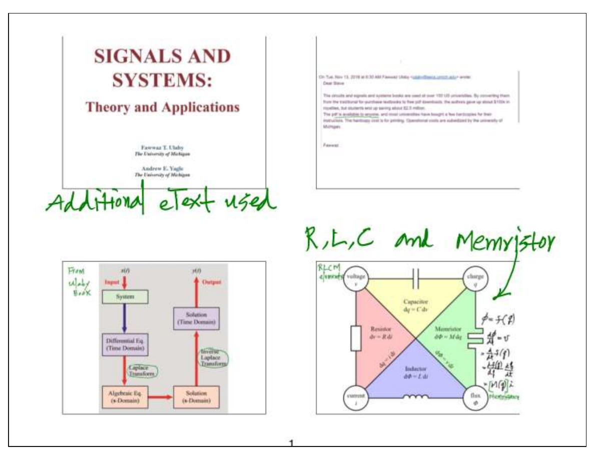

2

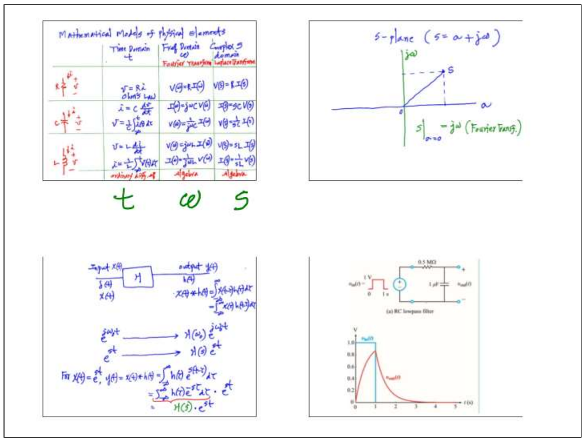

Bode Plot

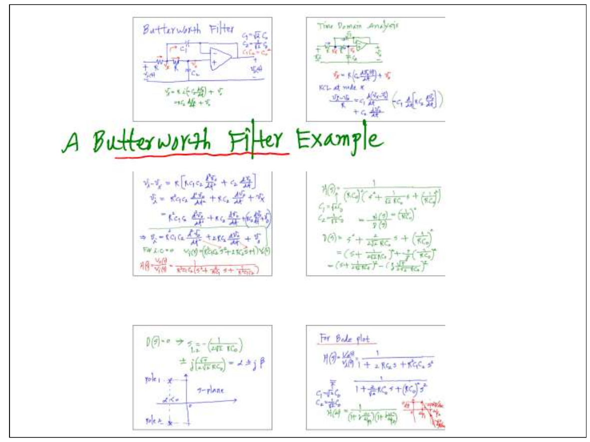


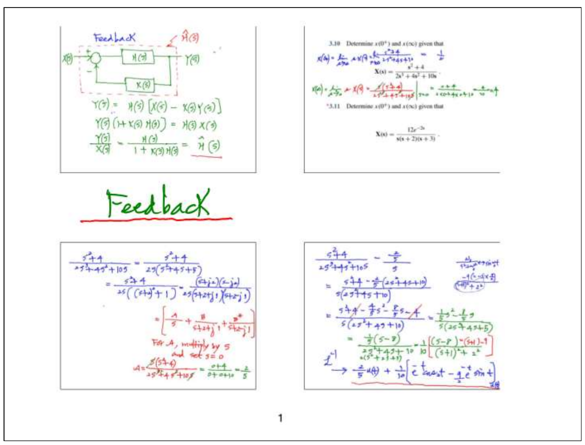

Shannon's Sampling Theorem

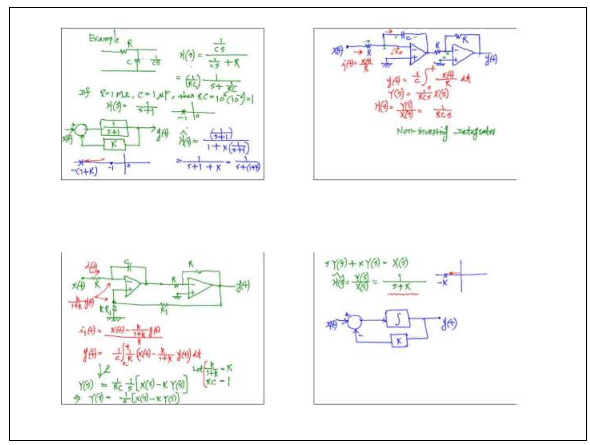

Aliasing error
3
Signal reconstruction
LP-filter

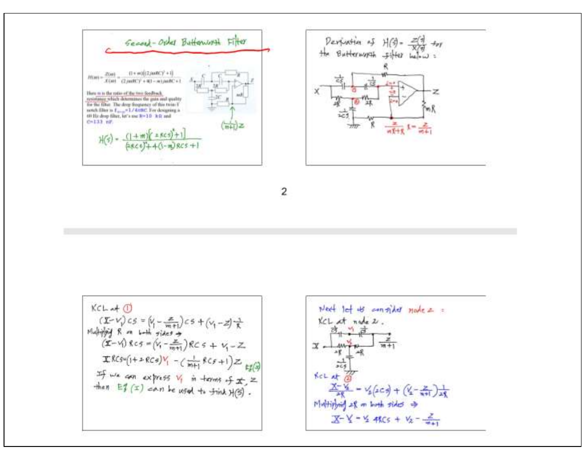

SIGNALS AND SYSTEMS:
Theory and Applications
Fawwaz T. Ulaby
Andrew E. Yagle
Additional eText used
R, L, C and Memristor
1

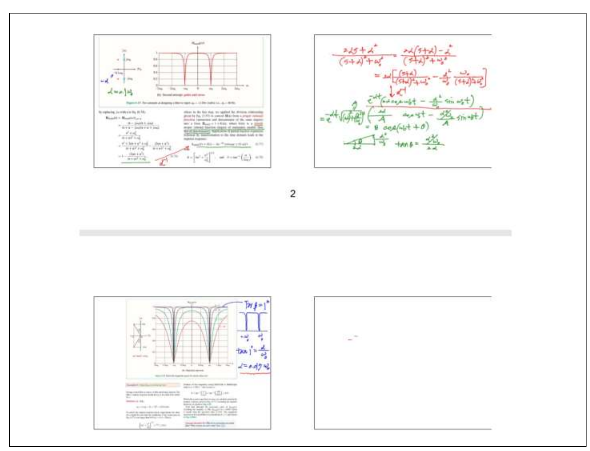

Mathematical Models of Physical elements
t
ω
s

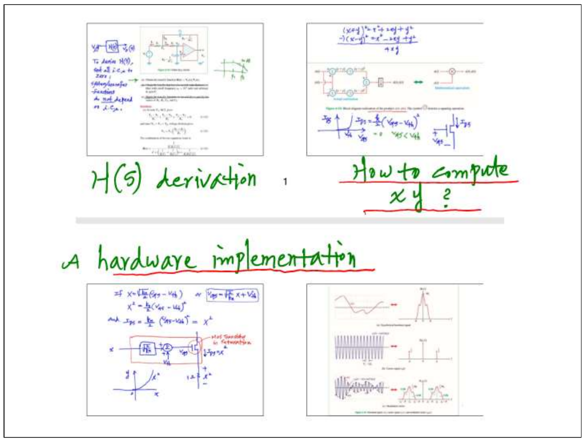

A Butterworth Filter Example


Feedback
1




2


2


H(s) derivation
How to compute
xy ?
A hardware implementation