Week 1-6 - Things to know

Know how:

----------Week 1----------

to transform from rectangular to polar coordinates and vice versa
to compute complex roots given polar and rectangular coordinate expressions
be able to define and plot unit impulse, constant, unit step, linear sequences and signals
to shift signals or sequences
to describe a sequence in terms of unit impulses
to check whether a signal/sequence is periodic and how to compute the period
to plot real and complex exponential sequences and signals. For complex exponential using either rectangular or polar expressions
to check whether a complex exponential is periodic or not
to plot a sinusoidal sequence/signal
to compute the period of a sinusoidal sequence
to define the digital frequency in terms of the analog frequency
to explain and apply the Nyquist theorem

to interconnect systems
to check whether a system has memory, is causal, is invertible or not

----------Week 2----------

to check whether a system is stable, is TI, is linear
to compute the impulse response of a LTI system
to compute a LTI system output, given x(n) and h(n)
to plot input, impulse response and outputs
to compute a convolution graphically

----------Week 3----------

no class

----------Week 4----------

to check whether a LTI system is stable using the impulse response
to plot a system block diagram given the I/O equation
to write the I/O equation given the system block diagram
to compute the impulse response of a LTI given the I/O equation
to compute the output response to a LTI system given the I/O response
to compute the initial condition response (single and multiple roots) of a LTI system and be able to check for the system stability
to compute the characteristic equation and the characteristic roots for single and multiple roots
to compute the complementary and particular solution of a I/O equation

----------Week 5----------

to compute the total solution for an I/O equation for a given set of initial condition and a given input signal
to know what the frequency response of a system is and how to compute it given a given I/O relationship
know what the output to a complex exponential or a cosine function is to a LTI system
know how to compute the magnitude/phase contribution of the frequency response and how it transforms the input complex exponential or sinusoidal function

----------Week 6----------

Be able to plot steady state response plots
Know how to apply properties of the frequency response
Know how to plot the frequency response: 1) be able to plot the trend for a simple frequency response magnitude, and 2) be able to use freqz.m to plot.
Understand how the frequency axis may be written in terms of the digital or analog frequency
Know what a dB is
Be able to write the frequency response given the I/O difference equation.

----------Week 7----------

Be able to estimate the magnitude amplification/decrease of a sinusoidal function 1) given the plot of the frequency response, or 2) the expression for the frequency response
Given an input signal, and an output signal to a LTI system, and given the frequency response information given by freqz.m,
Be able to explain the amplitude changes for the sinusoidal functions.
Be able to check whether a system is table given its frequency response expression

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be able to redo any of the examples done in class or handed out.