# EE 102 Nevin Liang

## Class Lecture Link:

<https://ucla.zoom.us/j/93158374262#success>

## Lecture 2; Wednesday, October 7, 2020

**Class Notes:**

* HW: 50%, Midterm 20%, Final 30%

Discrete vs continuous signals: discrete is when you sample continuous signals at different intervals

Scaling:

* Amplitude Scaling:
  + X(t) -> a\*X(t)
    - if 0 < a < 1, called attenuation
    - if a > 1, called amplification
    - if a < 1, called inversion
* Time Scaling:
  + X(t) -> x(at)
    - If 0 < a < 1: expansion
    - If a > 1: compression
    - If a = -1: time reversal
* Time shift:
  + X(t) shifted by amount t1 > 0:
    - X(t) -> x(t – t1): called delaying a signal
    - X(t) -> x(t + t1): called advancing a signal
* When doing multiple transformations at once, make sure to go from outside in
  + Ex: x(t) -> x(2(t-1)): first attenuate by a factor of 2, then delay 1 second.

Even if f(t) = f(-t) and odd if f(t) = -f(-t)

Even and Odd decomposition:

* X(t) = ½((x(t) + x(-t)) + ½(x(t) – x(-t))
  + First term is an even signal and second term is an odd signal
  + Because y(t) = y(-t) because x(t) + x(-t) = x(-t) + x(t) lol

Periodic Signals

* A continuous time signal is periodic if and only if there exists a T0 > 0 such that
  + X(t + T0) = x(t) for all t. T0 is the period of x(t)

HW #1: e^(j \* theta) = cos theta + j sin theta where j is the imaginary number (I is current lmao)

## Lecture 3; Monday, October 12, 2020

Class Notes

* X(t) = A\*cos(w\*t-theta) = A\*cos(2pi\*f\*t-theta)
* X(t) =