Final exam review topics for EE 313 Signals and Systems

Chapter 1 Fundamental Concepts
- continuous-time signals
- discrete-time signals
- systems & examples
- basic system properties- e.g., linearity, time-invariance, …

Chapter 2 Time-Domain Models of Systems
- Input/Output (I/O) representation of discrete-time (DT) systems
- convolution of DT signals
- difference equation models
- differential equation models
- solution of differential equations
- convolution representation of continuous-time systems

Chapter 3 The Fourier Series & Fourier Transform
- Trigonometric Fourier Series (periodic signals)- cosine & sine form
- Trigonometric Fourier Series (periodic signals)- cosine with amplitude & phase
- Complex exponential Fourier Series (periodic signals)
- Fourier Transform (aperiodic signals)- properties & transform pairs (Tables 3.1 & 3.2)
- Know definitions rectangular, $p_\tau()$ and triangular, $\Lambda_\tau()$, pulse functions
- generalized Fourier Transform

Chapter 4 Fourier Analysis of Discrete-Time Signals
- Discrete-Time Fourier Transform (DTFT)- def'n, transform pairs & properties (Tables 4.1 & 4.2)
- Discrete Fourier Transform (DFT) - definition, relationship with DTFT
- DFT of truncated signals
- Fast Fourier Transform (FFT) & applications

Chapter 5 Fourier Analysis of Systems
- Fourier analysis of continuous-time systems response to periodic (Fourier series/sinusoids)
- Fourier analysis of continuous-time systems response to nonperiodic inputs (Fourier transform)
- System response to sinusoidal inputs
- analysis of/with ideal filters
- sampling- sampling theorem, interpolation, aliasing
- Fourier analysis of discrete-time systems (DTFT, DFT/FFT)

Chapter 7 The *z*-Transform and Discrete-Time Systems
- *z*-Transform of a discrete-time signal and transform pairs (Table 7.3)
- *z*-Transform properties (Table 7.2)- use to do *z*-transforms and inverse *z*-transforms
- inverse Z-Transform- long division, transform pairs & properties, partial fractions
- *z*-Transform representation of a discrete-time system (I/O difference eqn's, signal flow graphs, …)