ECE3245/3230, Discrete Time Signals & Systems, Spring 2017
General Course Outline

1 Introduction (Lectures 1-9; Practicum I - DT Systems)
   1.1 Background, Objectives and Motivation
   1.2 Continuous & Discrete Time Signals
   1.3 Continuous & Discrete Time Linear Time Invariant (LTI) Systems
   1.4 Linear Constant Coefficient (LCC) Differential & Difference Equations

2 Time Domain Analysis of LTI Systems (Lect 10-15; Pract II - Sinusoidal Representation of Signals)
   2.1 Discrete Time (DT) Signal Impulse Expansion
   2.2 DT LTI System I/O Calculation: Impulse Response & the Convolution Sum
   2.3 CT LTI System I/O Calculation: Impulse Response & the Convolution Integral

3 Transform Analysis of CT Signals & Systems: Part 1 (Lect 16-19; Pract III - CTFS)
   3.1 Preliminary View of Spectrum Representation
   3.2 CT Fourier Series (CTFS) Representation of Periodic Signals

4 Preliminary View of Sampling and Aliasing (Lecture 20-21)
   4.1 Sampling Sinusoids: Temporal View
   4.2 Aliasing
   4.3 Sampling Sinusoids: Spectral View

\[1\text{Just overview.}\]
5 Transform Analysis for DT Signals & Systems (Lectures 21-34; Practicums IV-VI)

5.1 LTI System Response to Complex Exponential Signals
5.2 Discrete Time Fourier Series (DTFS) Representation of Periodic Signals
5.3 Discrete Time Fourier Transform (DTFT) Representation of DT Energy Signals
5.4 The DTFT Representation of Periodic Signals
5.5 Properties of the DTFT
5.6 The z Transform & Properties
5.7 The DTFT and DT LTI Systems
5.8 The z Transform & DT LTI Systems
5.9 Filtering
5.10 Channel Equalization
5.11 Spectrum Estimation

6 Transform Analysis for CT Signals & Systems: Part 2 (Lectures 35-42)

6.1 Overview of CT Transforms
6.2 Overview of CT Transforms applied to LTI Systems
6.3 Revisiting Sampling
6.4 Modulation
6.5 Overview of Random Processes

7 Summary (Lecture 42)