

EE:623
Advance Digital Signal Processing (A-DSP)
King Saud University

Course Instructor: Dr. Mubashir Alam
Email: mubalam@ksu.edu.sa

Grades Breakdown

Final/Project:	40%
Midterms:	60%

Text Book Followed:

Statistical Digital Signal Processing and Modeling
Monson H. Hayes

Course Outline

1. **Overview of Basic DSP and Random Process:** Convolution sum, Finite (FIR) and Infinite (IIR) Impulse Responses, Difference equations, Discrete-time Fourier transform (DTFT) and its properties, Random Signals, Z-transform (ZT) and its properties.
2. **Signal Modeling:** Least Square Method, Pade Approximation, Prony's Method, Finite Data Records, Stochastic Models (ARMA, AR and MA)
3. **The Levinson Recursion:** The Levinson-Durbin Recursion, Lattice Filters
4. **Optimum Filters:** The FIR Wiener Filter, Filtering, Linear Prediction, Noise Cancellation
5. **Spectrum Estimation:** Nonparametric Methods , Minimum Variance Spectrum Estimation, Maximum Entropy Methods, Parametric Methods, Frequency Estimation