

EECS 861
Topics for Test 2
Fall 2022

Power Spectral Density, $S_X(f)$

- $E[X(t)]$
- $\text{Var}[X(t)]$
- Bandwidth and correlation time
- % In-band power
- Random sequences

Properties of time averages- Integration of $X(t)$

Variance of time averages

- For large $2BT$, Number samples in average $\sim 2BT$

Ergodicity

Decomposition of RPs

Sampling of random processes

Quantizing

Major classes of RP

- Bandlimited White Noise
- ARMA

Response of Systems to Random Inputs

- Discrete time systems
- Continuous time systems
- Output Power Spectral Density
- Output autocorrelation functions
- Output S/N

Detection

- MAP rule
- Detector performance, $P_{\text{false alarm}}$, P_{Hit} , P_{miss} , P_{error}
- Bayes detection with cost
- Neyman-Pearson rule