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Coordinators

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Syllabus

References

Mathematical Background

Chapter 1: Representation of signals, 8hrs

- 1.1. Periodic signals and Fourier series
- 1.2. Aperiodic signals and Fourier transform
- 1.3. Properties of the Fourier transform
- 1.4. Unified approach to Fourier transform
- 1.5. correlation functions
- 1.6. Hilbert transform
- 1.7. Pre envelopes and complex envelopes
- 1.8. Band-pass signals and band-pass systems

Chapter 2: Probability Theory 6hrs

- 2.1 Basics of probability
- 2.2 Random Variables
- 2.3 Transformation of Variables
- 2.4 statistical Averages
- 2.5 Some useful probability models

Chapter 3: Random Signals 10hrs

- 3.1 Introduction to random Processes
- 3.2 Ensemble averages
- 3.3 System with random signal excitation
- 3.4 Spectral densities
- 3.5 The Gaussian process
- 3.6 Electrical noise
- 3.7 Narrow band noise

Part II (Chapters 4 and 5)

CW Modulation Schemes

Chapter 4: Linear modulation 6hrs

- 4.1 Time domain and frequency domain description of AM(DSB-LC), DSB-SC, SSB and VSB signals.
- 4.2 Generation and demodulation of linearly modulated signals
- 4.3 Super heterodyne receiver

Chapter 5: Angle Modulation 6hrs

- 5.1 Frequency Modulation (FM) and Phase Modulation (PM)
- 5.2 Narrow band and Wide band FM
- 5.3 Generation and demodulation of FM

Part III: Chapter 6

Chapter 6: Digital transmission of analog signals 8hrs

- 6.1 Sampling theorem
- 6.2 Uniform and non-uniform quantization in Pulse Code Modulation (PCM)
- 6.3 μ -law and A-law PCM
- 6.4 Differential PCM
- 6.5 Delta modulation (DM)
- 6.6 Electrical representation of binary sequences
- 6.7 Bandwidth requirement of PCM

Part IV: Chapter 7

Chapter 7: Noise performance of various Communication systems 6hrs

- 7.1 Noise performance of linearly modulated signals: Envelope detector and coherent detector
- 7.2 Noise performance of FM
- 7.3 Noise performance of PCM.

Total = 50 Hrs

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