

Relevant Course : Digital Communication Systems

Relevant Department : Electrical Engineering

Relevant Semester : 6

Pre- requisite : Capitalization

1. Why digital modulation? Baseband vs Passband signals, Signal representation using orthonormal basis, signal constellation, definitions for energy per symbol, energy per bit, noise power
2. Symbol-by-symbol signaling using rectangular (infinite bandwidth) signals, Matched Filter (MF) receiver, definition of SNR, Nyquist pulse-shaping for band-limited signals, timing recovery and inter-symbol interference (ISI), definition of excess bandwidth factor, symbol rate, bit-rate, Computing probability of symbol error for band-limited AWGN channels for important linear modulation schemes (PAM, PSK, and QAM), Orthogonal signaling and FSK
3. Communication through ISI channels optimal receiver based on sequence estimation, MAP and ML criteria , sub-optimal receiver using equalization, linear MMSE criteria based equalization, linear and decision-feedback equalization, defining equalizer using second order statistics the Wiener filter
4. Introduction to adaptive equalization, introduction to block modulation and OFDM
5. Tutorial session