

EE 5654 - Digital Communications - Spring 2004
Homework 5
Due Tuesday 4/26/05

1. Write an expression for the probability of error for a Golay code when used in conjunction with BPSK in terms of E_b/N_o . Plot the performance versus E_b/N_o .

2. You are in charge of a modem design project at Fred and Brothers Aerospace Corp. Your task is to find the most efficient design for the modulation and coding. Specifically, your team has developed Raised Cosine pulse filters with $\alpha = 0.33$. Further, you have 100kHz of bandwidth in which you must transmit 150kbps. You may choose any modulation scheme you wish, but must choose from BCH codes. Design the modem to meet your requirements with the lowest required E_b/N_o . Provide plots of various options to verify your design.

3. Using Matlab, simulate the performance of BPSK with rate $1/6$, $K=8$ convolutional coding. Use both hard and soft decision decoding and assume an E_b/N_o range of 0-7dB.