

ECE 457
HOMEWORK #8
Due March 25, 2005

- Read Chapter 4.1-4.4.
 - Office Hours: Th, 9:30-11:00 am in 2210EB.
1. [15] Given a binary communication channel where A is the input and B is the output, let $P(A=1)=0.4$ and probability of correct transmission 0.8. Compute the following probabilities:
 - a) What is the probability that 1 was sent given a 1 is received?
 - b) What is the probability that 1 was sent given a 0 is received?
 - c) What is the probability that 0 was sent given a 0 is received?
 2. [14] 4.9 from Ziemer and Tranter.
 3. [16] 4.10 from Ziemer and Tranter.
 4. [10] 4.23 from Ziemer and Tranter.
 5. [15] Assuming that X is a random variable with mean 3 and variance 4, and Y is a random variable with mean -1 and variance 2, and X and Y are independent, determine the following:
 - a) Let $Z=X-Y$. Compute the mean and the variance of Z.
 - b) Let $W=2X+3Y$. Compute the mean and the variance of W.
 - c) Compute the covariance of Z and W.
 6. [15] If X is a Gaussian random variable with mean 4 and variance 9, determine the following probabilities:
 - a) $P(X>7)$
 - b) $P(0<X<9)$
 - c) $P(X<4)$
 7. [15] 4.43 from Ziemer and Tranter.