ECE 341: Probability and Random Processes for Engineers, Spring 2012
Homework 9
Name:
Assigned: 03.07.2012
Due: 03.14.2012

Problem 1. Textbook problem 4.10.11. Do it on your own rather than looking at the solution.

Solution 1:

Problem 2. Show the following identities, for X, Y, U, V random variables which are not necessarily independent, and a, b, c, d are known constants.

- $\mathrm{Cov}(X+Y, U+V) = \mathrm{Cov}(X,U) + \mathrm{Cov}(X,V) + \mathrm{Cov}(Y,U) + \mathrm{Cov}(Y,V)$.
- $\mathrm{Cov}(aX+b, cY+d) = ac\mathrm{Cov}(X,Y)$.

Solution 2:

Problem 3. Let $X = Y + N$, where Y has the exponential distribution with parameter λ and N is Gaussian with mean 0 and variance σ^2. Suppose the variables Y and N are independent and the parameters $\lambda > 0$ and $\sigma^2 > 0$ are known. Find the mean-squared error linear estimator of Y given X.

Solution 3:

Problem 4. Textbook problem 4.11.3. Do it on your own rather than looking at the solution.

Solution 4: