Assignment 3 – ELEC ENG 3TQ3
Due Date: Nov 27th , 11:59 P.M.

1. (5 points) Consider two independent Gaussian random variables with expected values of 0 and variances 1. Let random variable U = 2X + 3Y and random variable V=X+2Y. Find the bivariate distribution of U,V. Hint: you can either calculate covariances and corresponding correlation coefficients or use matrix transformation as discussed in lectures.

2. (5 points) Consider two Gaussian random variables U and V such that: a) the expected value of U is 2 and variance of U is 9 and b) the expected value of V is 1 and variance is 16. In addition the covariance cov(U,V) is 3. Find coefficients a,b,c and d so that X=aU+bV and Y=cU+dV are jointly Gaussian and independent. What are the corresponding distributions of X and Y. Note: there may be multiple solutions but you need to find only one.