ECE 528: Introduction to Random Processes in ECE
Dr. Bijan Jabbari **Fall 2019**

Homework Set No. 1

Problems 1 (see below), and Chapter 1: 1.6, 1.7, 1.8 and 1.9

Problems 1: Consider the binary communication channel depicted below. The input at the transmitter is binary and it is either 0 or 1 with equal probabilities. Assume the channel is symmetric and transmission errors occur with probability p.

a) What is the probability of error (bit-error rate)?
b) Now assume we use coder and decoder as modelled in the Figure below and the encoder in the Figure below repeats each three times the input bits (i.e., 0→000 and 1→111) and the decoder makes a decision on the information bit by taking a majority vote of the three bits output. What is the improvement in the probability of error?