EXAM 3 MATERIAL AND EXPECTATIONS

For the exam, you should be able to do the following things:

Chapter 2.
- Given the cumulative distribution function of a continuous random variable, find the probability density function
- Given the density function, find the distribution function
- Use the density function or distribution function to compute probabilities
- Given either the density function or the distribution function, compute the expected value, variance, and standard deviation of the random variable

Chapter 4.
- Compute probabilities using the uniform distribution
- Compute probabilities using the exponential distribution
- Solve Poisson Process problems by using both the exponential distribution and the Poisson distribution.

Chapter 5.
- Use Table I of the distribution function of the standard normal to compute probabilities for a standard normal random variable
- Convert any normal random variable into a standard normal random variable to compute probabilities for any normal random variable, again using Table I
- Use that the sum or difference of normal random variables is still a normal random variable (and in particular, when they are independent, the variance of the sum is the sum of the variance)
- Approximate probabilities for a binomial random variable using the normal distribution

Chapter 6.
- Given a data set, calculate the sample mean, sample median, sample variance, and sample standard deviation
- Given a data set, sketch by hand a histogram or boxplot for the data set

Chapter 7.
- Calculate the bias of a point estimate of the mean
- Use Table I for the standard normal to approximate probabilities and critical values for the sample mean, $\bar{X}$, in the case when the population variance is known
- Use Table III of critical values of the t-distribution to compute critical values for the sample mean, $\bar{X}$, in the case when the population variance is unknown, but the sample variance is known