BIOC 455/555
Fall 2016
Homework # 7
Due at the beginning of class on Tuesday, October 25th.

Consider a Poisson process with rate $\lambda = 0.1$ events/sec that runs for $T = 100$ sec. Make sure to print your MATLAB code for those problems requiring MATLAB.

1. What is the expected number of events to occur?

2. What is the CV of the expected number of events?

3. Use MATLAB to simulate one "simple" stochastic realization of this process. Plot $n(t)$, the cumulative number of events as a function of time. (Note: you must use a small enough dt for the results to be accurate.)

4. Now use MATLAB to run separate stochastic realizations of this process to determine the mean and CV of the total number of events that occur in time T. (Note: you must run enough realizations for the results to be accurate.)

5. Using the same code from Question 4, plot a histogram of the probability distribution of the number of events that occur in time T. Compare this to the appropriate Poisson distribution.