Review Sheet: Midterm Exam BIOL6200-8200

No computer, know R commands. You can use a calculator. You will be given a Z-table and a T-table. ONE SIDE OF A standard notecard 4.25 x 5.5 in. You will have to write the R commands by hand.

- Know difference between descriptive statistics and inferential statistics.
    - Know the parameters for descriptive statistics and inferential statistics.
        - Know the basic R commands (mean, sd, etc).
    - Know how to calculate mean median mode.
    - Know how to calculate standard deviation.
- Probability concepts
    - Understand sample space and events.
    - Understand mutually exclusive, and independent
    - Marginal, joint, and conditional probability
    - Bayes Theorem
    - Prior, posterior, marginal probability in Bayes Theorem
- Random variables
    - Discrete vs Continuous
    - Probability density function (essential properties)
    - Discrete Random Variables
        - Bernoulli
        - Binomial (know the formula)
            - Permutation (know the formula)
            - Combination (know the formula)
                - Don't need to know if repeat is allowed
            - Know the R commands
                - Inclusive, not inclusive, upper tail, lower tail
        - Poisson (know the formula)
            - Know the R commands
    - Continuous Random Variables
        - Normal (know the z-formula)
            - Probability density function (essential properties)
            - Know the R commands to plot, determine normal distribution
            - Understand the Z score
            - Be able to use the Z table to figure out area under the curve, range, x values.
            - Know the R commands to calculate area under the curve, range, x values.
        - Normal approximation of the binomial (know the formula)
            - Know how to derive mean standard deviation for the approximation
            - Know how to calculate probability from the normal distribution
- Central limit theorem
    - Construct a sampling distribution
        - R commands to enter and randomly sample means
    - Empirical Rule
    - Confidence intervals using, Z score, and T score
        - Know what table to use depending on the situation and known parameters
- Hypothesis testing
    - Understand the steps in hypothesis testing
    - Know how to derive the test statistic, rejection region, and p-value.
        - Know R commands for each
    - Know how to draw the test statistic, rejection region, and p-value.
    - Understand types of error (alpha and beta), error table.

- Know the R commands from the Labs, basic plotting commands, how to determine normality.