Exam 3 is structured similarly to previous exams, with sections of true/false questions, open-ended conceptual questions, and application questions. There will be no practice version of the exam, but I recommend you use the following questions as study resources:

- Question #3 from Spring 2024 Exam 1 (multivariable regression)
    - https://remiller1450.github.io/s209s24/practice_exam1.pdf
- Question #2 Parts C-G from Spring 2025 Exam 3 (inference for multivariable regression)
    - https://remiller1450.github.io/s209s25/practice_exam3.pdf
- Question #3 Parts B-F from Spring 2025 Exam 3 (logistic regression)
    - https://remiller1450.github.io/s209s25/practice_exam3.pdf
- Questions #1 and #2 from Homework #8
- Question #2 from Lab 15
- Question #3 from Lab 16

Below are topics to study in order of importance to prepare for the true/false and conceptual questions on the exam:

Highest Priority:

- Marginal vs. adjusted vs. conditional effects
    - Know the basic definitions of each and how they differ
    - Understand when each type of effect would be appropriate
    - Know how conditional effects can be obtained via stratification
- Multivariable linear regression
    - How to interpret the estimated coefficients of a model
        - One-hot encoding of categorical predictors
        - Adjusted effects that hold constant any simultaneous changes that otherwise would have occurred in other predictors.
    - Basic workflow for statistical inference
        - Comparing nested models using F-tests
        - Checking model assumptions (independent, Normally distributed residuals with constant variable) using diagnostic plots
        - Assessing model effects using t-tests involving individual coefficients within a model
- Logistic regression
    - When/why it is used (binary categorical response variable with one or more predictors)

    - Visual differences between linear and logistic regression (basic understanding of the S-shaped logistic curve and how the slope coefficient contributes to the shape).
    - Interpretation of model coefficients (intercept, continuous numeric predictors, and dummy variables). This includes the need to exponentiate.

Medium Priority:

- Marginal vs. adjusted vs. conditional effects
    - How to obtain an adjusted effect by re-weighting (as seen in Lab 13)
- Multivariable linear regression
    - Log-transformation as a solution to address violated assumptions for inference
- Logistic regression
    - Hypothesis tests provided by summary() on model coefficients, including interpretations, stating the null hypothesis, and knowing the large sample size assumption underlying these tests
    - What an intercept only model looks like visually (flat/horizontal line with a y-intercept at the sample proportion)

Low Priority:

- Multivariable linear regression
    - Interpreting model coefficients after the outcome variable has been log-transformed
    - How residual plots can indicate a missing non-linear relationship (ie: U-shaped pattern -> need for quadratic/polynomial relationship)
- Logistic regression
    - Finding confidence intervals for odds ratios using R output (ie: exponentiating endpoints)