Scope of Midterm #1

Midterm #1 covers the topics covered in the first 3 homework assignments plus all topics covered in class up to, but not including, split-plot experiments. Since I don’t have any exams from previous classes, the following is intended to help you study. It is not intended as an exhaustive list of everything I might ask.

One- and multiway- (fixed effects) ANOVA with interactions and 1-way random effects ANOVA

- Recognize these designs when described in words and be able to write down the corresponding model.
- Interpret the parameters.
- Calculate degrees of freedom.
- State the null and alternative hypothesis for tests.
- Compute and test the F statistic given sufficient information in the ANOVA table. You do not have to memorize SS formulas.
- Fixed effects only:
  - Interpret the sum of squares formulas (1-way ANOVA only).
  - Interpret interactions including drawing interaction plots for up to 3-way interactions.
  - Construct a design matrix given appropriate effect contrasts.

Contrasts and Multiple comparisons for 1-way ANOVA

- Construct and test contrasts.
- What are, and why do we worry about, multiple comparisons.
- What do the various common methods for multiple comparisons claim to do.

Sub-sampling, Blocking

- Recognize these design elements when described in words and be able to write down the corresponding model including these elements.
- Interpretation of the parameters associated with these design elements.
- Write down ANOVA tables (not SS formulas) including these elements.
- Testing for significant fixed effects in the presence of sub-sampling.
- Ability to answer questions about why a design might include these elements.

Be flexible

Be open to new things and reasoning things out. For example, the design elements above can be combined in ways we may not have seen. If I include these sorts of questions I always give lots of supporting hints and information.