

I have not yet made the first quiz but here is what I am envisioning at this point. I may send an update early next week if there are changes once I construct the actual quiz. The primary material on the first exam will be from Chapters 1 and 2, with some information on the first part of Chapter 3.

1) Perform all aspects of a one-way ANOVA from R output that will be provided. Aspects will include determining if group means are significantly different, identifying which group means are different, interpreting confidence intervals for differences in group means, and placing significance letters on a means plot. The results may be on a transformed scale. You should be able to interpret results from `anova()`, `confint()`, and `fitPlot()` on an `lm()` object and `summary()` and `confint()` on a `glht()` object. This would be similar to HW 2.6 and 2.7.

2) Analyze assumptions from R output that will be provided. You should be able to interpret results from `leveneTest()`, `adTest()`, and `outlierTest()`, along with `residPlot()` and `transChooser()`. This would be similar to 2.5 and parts of 2.7.

3) Fill in an incomplete ANOVA table for a one-way or a two-way ANOVA test and answer questions about the completed table. This would be similar to HW 2.1–2.3 and 3.2 (but not from computing the SS from mean values). See next page for two more for practice.

4) Identify “effects” evident on paired interaction plots. This would be similar to HW 3.1 (and lots of examples in the lecture slides).

4) Answer four (from a list of six) short-answer questions. These will largely be around major concepts discussed in class and in the reading – for example (but not limited to) models; df, SS, MS, and F; error rates; multiple comparisons; factorial designs; and transformations.

Two of the questions deal with real data. Here are the backgrounds to those two questions:

Vanderlan and Robinson (2008) examined the effectiveness of riparian wetlands in improving water quality in Patroon Creek, a tributary to the Hudson River, in urban Albany, NY. In one part of their study they recorded the concentrations of chloride ion concentrations in water samples collected from each of four positions in the wetlands (labeled as A-D, with A being furthest from and D being the closest to Patroon Creek) and at each of two sections of the watershed (upstream or downstream). The author’s goal was to determine if the mean chloride ion concentration was affected by position in the wetland (POS), section of the watershed (SEC), or the interaction between both factors.

Dalling *et al.* (1998) examined the dispersal patterns and seed bank dynamics of the pioneer tree *Miconia argentea* on Barro Colorado Island, Panama. In one part of their study they recorded the density of seeds (number per m²) in the top 3 cm of the soil at 0, 5, 10, and 20 m away from the crown of four *Miconia argentea* trees. In other words, for each tree, the density of seeds at 0, 5, 10, and 20 m away from the tree was recorded. The author's goal was to describe how the mean density of seeds changed (if at all) as one moved away from the tree. The data from this study were entered into R and analyzed with the commands and the end of the quiz handout. Answer the questions below **with the fullest amount of detail that you can provide – be specific and refer to results where appropriate** (you may want to label figures and tables on the output).

The quiz is closed book and closed notes, you will not need to use R (but will need to be able to interpret results provided from R), you should bring a calculator and a pencil (quizzes written in pen will not be accepted), answers can be typed if you so choose (I will not accept quizzes that I cannot easily read) but I will be monitoring computer use during the exam, and you will have from noon–1:55 to complete the quiz.

Please let me know if you have any questions. Thanks.

Example #1 ... 2 row levels, 3 column levels

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
row			558.58		< 2e-16
col				447.516	< 2e-16
row:col		95.57	47.78		5.7e-12
Residuals		59.40			
Total	59				

Example #2 ... 3 row levels, 3 column levels

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
row			155.317	151.7894	< 2e-16
col					0.55274
row:col			3.615		0.01566
Residuals	36				
Total		363.16			