

## Final Exam

All 3 data sets can be found in the Excel workbook on the website. The data sets for each problem are contained in the worksheets **Problem 1**, **Problem 2**, **Problem 3**.

1. A biologist studied 10 ponds stocked with larval striped bass. Before stocking the ponds, 5 ponds were treated with lime in an attempt to improve survival rate. Each pond was divided into three sections and one of three different types of food pellets was fed to the striped bass in each section. After 10 weeks, 5 striped bass were taken from each pond and measured (length in mm).
  - (a) Identify the design. Construct a model, listing assumptions and all relevant terms.
  - (b) Suppose that at the time of measurement, the pH of each pond was sampled. Would this be a split plot covariate or a whole plot covariate?
  - (c) Use the attached worksheet to fit the split plot model without the covariate, and then with the covariate. Analyze your results. How does inference on the whole plot factor change?
2. The attached data set was generated from a repeated measures experiment. The factors have been given conventional repeated measures model names: Group, Subject (nested in Group), and Time. Do the measurements (the variable Response) over Time seem correlated? In PROC MIXED, find a model that provides the best fit (using AIC) of the covariance structure for the repeated measures factor **Time**.
3. Consider the following crossover design:

Period	Female			Male		
	1	2	3	1	2	3
1	A=21	B=16	C=14	B=12	C=14	A=16
2	B=15	C=13	A=22	C=9	A=17	B=10
3	C=13	A=16	B=15	A=14	B=15	C=12

- (a) Ignoring Gender, construct a model for this data set and analyze it.
- (b) Include Gender as a factor and reanalyze the model. Does the inference change if you include a Gender\***Treatment** interaction? Compare results from the separate analyses.