

Second Take-Home Exam: Given 20 April, Due 27 April. Same format as first take-home exam.

Project: Due Tuesday, 4 May 5pm. (If we had an in-class final, it would be 4 May, 10:30am-2:30pm).

Possible Projects Include: 1. Design a new experiment for your research; 2. Analyze one of your “old” datasets with new techniques, which you teach yourself in the course of the project; 3. Design a simulation that gives you new insights into a statistical procedure that will be useful for your research. Note the common theme, “Your Research,” which is the point of this class. Because most of you seem to prefer the first option, I will outline that expectation in detail.

Design an Experiment: ~10 type-written, double-spaced pages. Your project should be written in standard “proposal” format, such as an NSF Doctoral Dissertation Improvement grant proposal, or an IACUC (animal care) proposal.

1) Title

2) Abstract (~.5 pages): a non-technical summary of your proposed experiment, and why it’s so earth shattering.

3) Introduction (~2 pages): Sets the stage for the conceptual questions being addressed, and the system (e.g. species) used to address them. Hypotheses should be clearly specified.

4) Materials and Methods (~6 pages): This is the meat of your project. It should clearly specify experiment’s design from the point of view of the equipment and resources that will be used, and especially from the point of view of the statistics that will be used to analyze the data.

a) **Power Analysis:** Sample sizes should be based on a prospective power analysis (e.g. SAS’s Proc Glimpower, GPower3, Systat’s power analysis tools), which in turn is based on anticipated effect sizes.

b) **Model Statement:** This is in the form of a linear ANOVA model, where you identify...

i) **Response (Dependent) versus Predictor (Independent) Variables**

ii) **Categorical versus Continuous Variables**

iii) **Fixed versus Random Variables**

iv) **Error terms**

v) **Assumed Distribution**

c) **Time Table:** a schedule that includes the beginning and ending of your experiment, and how many person hours per day are required to collect your data. In other words, your proposed sample sizes have to be humanly possible to accomplish.

5) Results/Discussion (~2 pages): Here describe how you would interpret your results if they were significant, not quite significant, very not significant, and what further experiments you might do.

6) Literature Cited (.5-1 pages)