

Guidelines

Final Exam & Practicum 2

Prof. Jack Reilly

Fall 2026

Your exam has two parts: a take-home exam and an in class exam.

- On the **in-class exam**, you are permitted the full exam time (although the exam will likely not take the whole time). You may bring your own simple calculator (not graphing). If you do not have one, the department will provide one. You may also bring a pen and/or pencil, and a single page “cheat sheet” — an 8x11 sheet of paper with whatever you want written (or typed) on the page, front and back.
- On the **take-home exam**, you are permitted as much time as you like between when the exam is handed out and when it is due. The take-home IS **open-book**, **open-note**, and **open-internet**, but it IS NOT **open-human** or **open-ai**. In short: you can use any resource you want, so long as that resource does not involve asking another intelligence, whether human or artificial, a question. (You can ask the professor questions.)
- On both parts of the exam, all material covered in the class, in reading, or in homework is fair game, although the take-home will lean towards using computation and the in-class portion will lean towards conceptual/hand calculation questions.
- The final exam is comprehensive, and may include material from all portions of the class (before and after the midterm). It will focus more on material after the midterm, however.
- *A hint/word of advice:* broadly speaking, the second half of the class covers fewer items, but covers them in more depth (as well as brings concepts from before the midterm together in new ways.) Don’t let the shorter review guide mislead you about the overall amount of content covered since the midterm!
- In addition to this review sheet, there is an additional “problem set” of practice problems available — see [Bonus: Extra Practice](#). You do not have to turn this problem set in, but it is there if you would like additional practice. There are also a variety of extra problems available at the end of lecture slides from various class days.

The [reference tables](#) page shows the statistical tables you will have available to you on the exam.

1. Midterm Material

Review everything on the [Midterm Review](#) page.

2. Sampling

- Sample Distribution
- Population Distribution
- Sampling Distribution
- Central Limit Theorem
- Estimators as Random Variables
- Standard Error of the Mean
- Standard Error of a Proportion
- Standard Error of a Count

3. Inference

- Confidence Intervals
 - Point Estimate
 - Margin of Error
 - Critical Values
 - Ways to reduce margin of error
 - Statistical Power
 - Inference when σ is unknown
 - Student's T distribution
 - Degrees of freedom (df)
- Hypothesis Testing
 - Logic of Hypothesis testing
 - Null Hypothesis (H_0)
 - Alternative Hypothesis (H_A)
 - Types of Hypothesis Test
 - * Tabular Analysis
 - * Difference in Means
 - * Correlation Coefficient
 - * Regression
 - How to choose test statistic
 - Critical Values (Z, T, χ^2)

- One-Tail vs Two-Tail Tests
- P-values
- Type I and Type II Errors

4. Regression

- Bivariate Regression
- Dichotomous Dummy Variables
- Difference in Means Tests via Regression
- Statistical Significance (hypothesis testing, confidence intervals, t- and p- values, etc)
- Substantive/Practical Significance (effect magnitudes, predicted values, R^2)
- Multiple Regression
- Confounding variables in Multiple Regression
- Multi-category Variables and Dummy Variables (*optional*)
- Standardized coefficients (*optional*)
- Simple model comparison: R^2 , effect magnitudes, predicted values (*optional*)

5. Stata vs Hand Calculation

- By hand, be able to:
 - Do all calculations from before the midterm
 - Calculate standard error of the mean
 - Calculate confidence intervals
 - Tabular Analysis w/ χ^2
 - Look up critical values on z, t, and χ^2 tables
 - In regression, calculate T if given slope and standard error
 - In regression, calculate R^2 if given two of three (MSS, ESS/RSS, TSS)
- Only via Stata:
 - Calculate standard errors, T statistics, p-values for difference in means tests
 - Calculate regression coefficients, T statistics from raw data, p-values
- Selected Stata commands

```
cd, use, clear, tab, sum, tabstat, gen, sort, browse,
tway, scatter, histogram, graph export, corr, reg,
disp, bys, predict, save, keep, drop, if, recode,
collapse, preserve, restore, ttest
```