

MONT 101N – Analyzing Environmental Data
Information for Final Exam

General Information

The final exam will be given on Tuesday, May 15 from 11:30am to 2:00pm in our regular classroom, Swords 209. If you are well-prepared and work steadily, I expect that you will complete it within about one and a half hours. However, if you need more time, you will have until 2:00pm to work on the exam.

The final will cover *the portions of the material from Chapters 9, 10, 11, 12 of the course notes that discussed in class*. There are several sections we did not discuss and you are *not responsible* for them: 9.5, 11.5, 12.5, 12.6, 12.7, and 12.8

1. Descriptive statistics – mean and median, SD, quartiles, 5-number summary, box plots; using these to explore data.
2. Selection processes that can be modeled by drawing balls from an urn with and without replacement – binomial and hypergeometric probability formulas, applications of these.
3. p.d.f.'s, normal distributions, z -scores and computing normal probabilities.
4. The Central Limit Theorem and its consequences.
5. Sampling and chance errors in sampling.
6. Confidence intervals for percentages in the large sample case. Be sure you understand exactly what the “95% confidence” refers to and the ramifications of this.
7. Confidence intervals for averages in the large sample case and small sample cases.
8. Tests of significance – large sample (z -) tests for percents and averages, differences of percents and differences of averages. Small sample (t -) tests for averages.

I will supply copies of any tables you need to use (that is, the z -table and the t -table from our class textbook). I will also provide a copy of the listing of test statistics, and other information that we have used in the discussion of hypothesis tests. *To minimize the need to memorize a lot of stuff, you may also bring one side of a 3×5 inch index card to the exam with any formulas or other information you want to include and consult it at any time. I will collect these cards with the exam.*

This exam will have no essay question – only questions on the mathematics. But some of the questions might ask for a short paragraph of explanation rather than just a numerical answer.

Suggestions on How to Study for This Exam

If you haven't been doing this regularly, *read (the relevant portions of) the class text(!)* Review the problems from the problem sets. Try those again, and if necessary look at some of the other problems in the text. Then look at the final exam practice problems posted on the course homepage. The main tricky thing about the material we have looked at this semester is deciding what kind of question you are trying to answer. For example, is

the question asking about a particular statistic of a collection of numbers produced by a chance process, or is it asking about a percentage, or an average, or the difference of two averages (that is, is it asking for a two-sample test), etc.? And what is the sample size? (This is how you distinguish between z - and t -tests.) If you think that out first, you will see which formulas are applicable.

Please take note

No use of cell phones, I-pads, I-pods, or any other electronic devices beyond a calculator will be allowed during the exam – please turn them off and stow them in your backpack. *If your only calculator is on your phone, please arrange to obtain a separate calculator to use on the exam.*