

STAT 651 Course Learning Outcomes

This is a course about the basics of statistical reasoning and data analysis. I believe that statistical reasoning can only be done in the context of data. You will be analyzing many data sets, which includes the mechanics of running statistical methods on the computer, and how to interpret them. You will not be asked to memorize formulae. You will be asked searching questions about what various statistical analyses mean, and about sensitivity of the formulae to things like larger sample sizes, etc.

1. Sampling, populations, histograms, sample means and medians
2. Quantiles, boxplots, percentiles, variability, basic probability, empirical rule, bell-shaped curves
3. Computing normal probabilities, the q-q plot, standard error of the mean, basic inference.
4. Confidence intervals for the mean when the population standard deviation is known, properties of confidence intervals.
5. Hypothesis testing, statistical power, p-values, never accepting a null hypothesis
6. Sample size calculations, paired comparisons, student's t, confidence intervals
7. Wilcoxon signed ranks test, comparing two population means
8. T-tests and comparing two population means
9. Wilcoxon rank sum tests for comparing two populations, testing for equal variances, effects of outliers.
10. ANOVA
11. More ANOVA and Review
12. Exam #1
13. Multiple comparisons
14. Kruskal Wallis tests, tests for normality, more ANOVA
15. Inference about a proportion, Comparing population proportions
16. More on Comparing population proportions
17. Chisquared test for independence
18. Simple linear regression
19. Tests for whether two variables are related
20. Exam #2
21. R-squared, outliers, leverage
22. Correlation, confidence intervals for a line
23. Confidence intervals for an actual response (Prediction intervals)
24. Comparing population lines
25. Logistic regression
26. More logistic regression
27. More logistic regression and many examples.
28. Class review.